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PART I

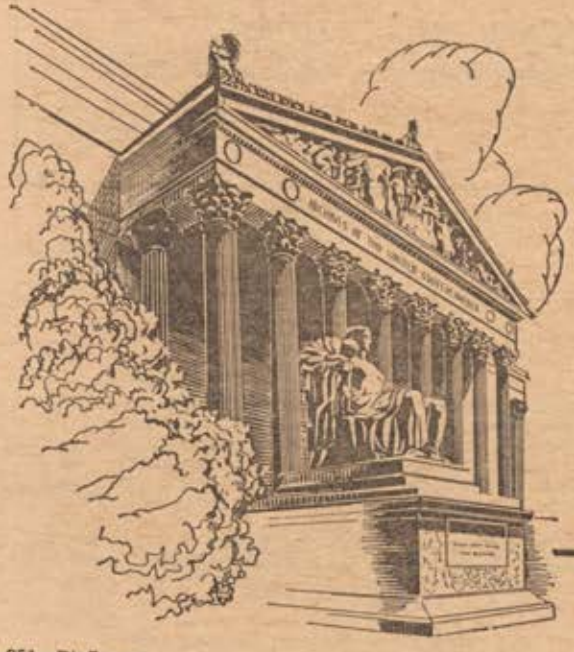
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Atomic Energy Commission
Civil Aeronautics Board
Civil Service Commission
Coast Guard
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Consumer and Marketing Service
Customs Bureau
Engineers Corps
Federal Aviation Agency
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THE NATIONAL ARCHIVES OF THE UNITED STATES • 1934 •

How To Find U.S. Statutes and U.S. Code Citations

[Revised Edition—1965]

This pamphlet contains typical legal references which require further citing. The official published volumes in which the citations may be found are shown alongside each reference—with suggestions as to the logical sequence to follow in using them. Additional finding aids, some especially useful in citing current legislation, also have been included. Examples are furnished at pertinent points and a list of references, with descriptions, is carried at the end.

This revised edition contains illustrations of principal finding aids and reflects the changes made in the new master table of statutes set out in the 1964 edition of the United States Code.

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The following numerical guide is a list of the parts of each title of the Code of Federal Regulations affected by documents published in today's issue. A cumulative list of parts affected, covering the current month to date appears at the end of each issue beginning with the second issue of the month.

A cumulative guide is published separately at the end of each month. The guide lists the parts and sections affected by documents published since January 1, 1965, and specifies how they are affected.

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Title 7—AGRICULTURE

Chapter I—Consumer and Marketing Service (Standards, Inspections, Marketing Practices), Department of Agriculture

PART 53—LIVESTOCK, MEATS, PREPARED MEATS, AND MEAT PRODUCTS (GRADING, CERTIFICATION, AND STANDARDS)

Official U.S. Standards for Grades of Swine

On June 26, 1965, there was published in the FEDERAL REGISTER (30 F.R. 8225) in accordance with section 4 of the Administrative Procedure Act (5 U.S.C. 1003), a notice that the Consumer and Marketing Service of the Department of Agriculture, under the provisions of sections 203 and 205 of the Agricultural Marketing Act of 1946, as amended (7 U.S.C. 1622 and 1624), was considering amending the provisions of the official U.S. standards for swine in §§ 53.150 and 53.151 of Part 53, Title 7, Code of Federal Regulations, and promulgating official U.S. standards for grades of feeder pigs to appear in §§ 53.158 and 53.159 of that part.

Statement of considerations. A basic principle in the development of standards for livestock and meats in that standards for feeder animals should conform closely to those for slaughter animals and the resulting carcasses. In 1940 tentative standards for grades of feeder pigs were developed and published by this Department in USDA Circular No. 569, "Market Classes and Grades of Swine." Although these tentative standards were never promulgated as official standards, they have been used as the basis for Federal and Federal-State livestock market news reports on feeder pigs and thus are of major importance to the industry. These tentative standards, however, are no longer considered adequate in view of the standards for slaughter swine and pork carcasses which have been developed since 1940.

In recent years the number of feeder pigs graded and sold in special sales has increased substantially. In line with this change in feeder pig marketing, a number of States have inaugurated grading programs based on their own standards. This increased interest and activity in the grading and marketing of feeder pigs has emphasized the need for official U.S. standards for grades of feeder pigs that are closely coordinated with the standards for grades of slaughter barrows and gilts. Such standards applied on a uniform basis throughout the country could result in further improvements in production and marketing and make market reports more meaningful and useful.

After consideration of all material submitted pursuant to the notice of proposed rule making and other material available to the Department, it is evident that there is a need for the promulgation of official standards for grades of feeder pigs. Therefore, pursuant to the said authority cited above, the provisions of the official U.S. standards for swine in 7 CFR 53.150 and 53.151 are hereby amended and official U.S. standards for grades of feeder pigs are hereby promulgated to appear in 7 CFR 53.158 and 53.159, as specified below:

1. Section 53.150 of the U.S. standards for swine is amended to read as follows:

§ 53.150 Swine.

The official standards for swine developed by the U.S. Department of Agriculture provide for segregation first according to intended use—slaughter or feeder—then as to class, as determined by sex condition, and then as to grade, which is determined by the apparent relative excellence and desirability of the animal for a particular use. Differentiation between slaughter and feeder swine is based solely on their intended use rather than on specific identifiable characteristics of the swine. Slaughter swine are those which are intended for slaughter immediately or in the near future. Feeder swine are those which are intended for slaughter after a period of feeding.

2. Section 53.151 of the official U.S. standards for swine is amended to read as follows:

§ 53.151 Slaughter and feeder swine classes.

There are five classes of slaughter and feeder swine. Definitions of the respective classes are as follows:

(a) *Barrow.* A barrow is a male swine castrated when young and before development of the secondary physical characteristics of a boar.

(b) *Gilt.* A gilt is a young female swine that has not produced young and has not reached an advanced stage of pregnancy.

(c) *Sow.* A sow is a mature female swine that usually shows evidence of having reproduced or having reached an advanced stage of pregnancy.

(d) *Boar.* A boar is an uncastrated male swine.

(e) *Stag.* A stag is a male swine castrated after development or beginning of development of the secondary physical characteristics of a boar. Typical stags are somewhat coarse and lack balance—the head and shoulders are more fully developed than the hindquarter parts, bones and joints are large, the skin is thick and rough, and the hair is coarse.

3. New §§ 53.158 and 53.159 are promulgated to read, respectively:

§ 53.158 Application of standards for grades of feeder pigs.

(a) The grade of a feeder pig is determined by evaluating two general value-determining characteristics—its logical slaughter potential and its thriftiness.

(b) The logical slaughter potential of a thrifty feeder pig is its expected slaughter grade at a market weight of 220 pounds after a normal feeding period. In these feeder pig standards, logical slaughter potential is determined by a composite appraisal of the development of the muscular system and the skeletal system. Both of these factors have an important effect on the development of lean and fat as the animal grows and fattens, and therefore, on the expected slaughter and carcass grade.

(c) Thriftiness in a feeder pig is its apparent ability to gain weight rapidly and efficiently. Size for age, health, and other general indications of thriftiness are considered in appraising the thriftiness of feeder pigs.

(d) The standards provide for five grades of feeder pigs—U.S. No. 1, U.S. No. 2, U.S. No. 3, Medium, and Cull—corresponding in name to the five grades for slaughter swine and pork carcasses. The No. 1, No. 2, and No. 3 grades include all pigs which are thrifty. Differentiation between the No. 1, No. 2, and No. 3 grades is based entirely on differences in logical slaughter potential. Feeder pigs in the No. 1 grade have sufficient muscling and frame to reach a market weight of 220 pounds with near the minimum degree of finish required for the production of cuts with acceptable quality characteristics. Feeder pigs in the No. 2 and No. 3 grades usually have progressively less muscling and less frame and are expected to have progressively more finish when marketed at 220 pounds. The Medium and Cull grades include only pigs which lack thriftiness. Differentiation between these grades is based entirely on differences in degree of unthriftiness.

(e) Most feeder pigs are marketed when relatively young and before reaching a weight of 125 pounds. At this age, sex condition exerts little influence on the basic factors determining the feeder grade. Therefore, these standards are equally applicable for grading barrow, gilt, and boar pigs, although it is recognized that sex condition may influence the market price in some instances. It is assumed that boar pigs which are graded as feeder pigs will be castrated prior to developing the secondary physical characteristics of a boar. Sows, stags, and mature boars are seldom used as feeder animals, and these standards do not apply to those classes.

(f) Only one combination of muscling and skeletal characteristics is described in the standards for the No. 1, No. 2, and No. 3 grades. However, it should be recognized that pigs with thicker muscling and less frame or those with thinner muscling and greater frame than described in each of these grades also may be eligible for that grade. Since no attempt is made to describe the numerous combinations of characteristics that may qualify a feeder pig for a specific grade, making appropriate compensations for varying combinations of characteristics requires the use of sound judgment.

§ 53.159 Specifications for official United States standards for grades of feeder pigs.

(a) *U.S. No. 1.* Feeder pigs in this grade near the borderline of the U.S. No. 2 grade are slightly long in relation to width and have moderately thick muscling throughout. Thickness of muscling is particularly evident in moderately thick and full hams and shoulders. The back usually appears slightly full and well-rounded. They usually present a well-balanced, stylish appearance. Feeder pigs in this grade are expected to produce U.S. No. 1 grade carcasses when slaughtered at 220 pounds.

(b) *U.S. No. 2.* Feeder pigs in this grade near the borderline of U.S. No. 3 grade are slightly short in relation to width and have only slightly thick muscling throughout. The hams and shoulders are slightly thick and full and the back usually appears moderately full and thick. Feeder pigs in this grade are expected to produce U.S. No. 2 grade carcasses when slaughtered at 220 pounds.

(c) *U.S. No. 3.* Feeder pigs typical of the No. 3 grade are short and have rather thin muscling throughout. The hams are thin and rather flat, particularly in the lower parts toward the shanks. The back usually appears full and thick and the width at the topline usually is greater than at the underline. Feeder pigs in this grade are expected to produce U.S. No. 3 grade carcasses when slaughtered at 220 pounds.

(d) *Medium.* Feeder pigs in this grade near the borderline of the Cull grade usually are small for their age and appear unthrifty. They often have a rough, unkempt appearance indicating the effects of disease or poor care. The hams and shoulders usually are thin and flat and taper toward the shanks. The back is thin and lacks fullness. Pigs in this grade near the borderline of the U.S. No. 1, U.S. No. 2, and U.S. No. 3 grades are slightly small for their age and appear slightly unthrifty. It is recognized that Medium grade feeder pigs will produce No. 1, No. 2, or No. 3 grade carcasses when slaughtered at 220 pounds provided their unthrifty condition is corrected.

(e) *Cull.* Feeder pigs typical of this grade are very deficient in thriftiness and growthiness and often appear stunted or diseased. Hams and shoulders usually are very thin and flat and taper toward the shanks. They are narrow over the top and the back is thin and often slopes away from the center.

(Sec. 203, 60 Stat. 1087, as amended; sec. 205, 60 Stat. 1090, as amended; 7 U.S.C. 1622, 1624)

These standards embody slight changes from the proposals in the notice of rule making. These changes are made pursuant to comments received in connection with the notice and are made for purposes of clarity and uniformity of interpretation. It does not appear that further notice and other public procedure would make additional information available to the Department. These provisions should be made effective as soon as possible in order to be of maximum benefit to affected persons. Since most statistical reports are compiled on a yearly basis, more uniform and meaningful statistical reporting would be possible if these standards were in effect at the beginning of the calendar year. Therefore, under section 4 of the Administrative Procedure Act (5 U.S.C. 1003), it is found upon good cause that further public procedure with respect to the promulgated standards is impracticable and unnecessary and such standards may be made effective less than 30 days after publication in the FEDERAL REGISTER.

The foregoing provisions shall become effective January 1, 1966.

Done at Washington, D.C., this 27th day of December 1965.

G. R. GRANGE,
Deputy Administrator,
Marketing Services.

[F.R. Doc. 65-13939; Filed, Dec. 29, 1965; 8:48 a.m.]

Chapter IV—Federal Crop Insurance Corporation, Department of Agriculture

PART 401—FEDERAL CROP INSURANCE

Subpart—Regulations for the 1961 and Succeeding Crop Years

APPENDIX; COUNTIES DESIGNATED FOR COTTON CROP INSURANCE

Pursuant to authority contained in § 401.1 of the above-identified regulations, as amended, the following counties are hereby added to the list of counties published October 28, 1965 (30 F.R. 13686), which were designated for cotton crop insurance for the 1966 crop year.

ALABAMA
Barbour. Lauderdale.

ARIZONA
Maricopa. Yuma.

ARKANSAS
Chicot. Desha.

GEORGIA
Ben Hill. Thomas.

LOUISIANA
Caldwell.

MISSISSIPPI
Calhoun. Carroll.

MISSOURI
Dunklin. Pemiscot.
Mississippi. Stoddard.

NORTH CAROLINA
Montgomery. Rowan.

SOUTH CAROLINA
Aiken. Bamberg.

TENNESSEE
Chester. Lawrence.

TEXAS
Calhoun. Hudspeth.
Haskell. Victoria.

(Secs. 506, 516, 52 Stat. 73, as amended, 77, as amended; 7 U.S.C. 1506, 1516)

[SEAL] JOHN N. LUFT,
Manager,
Federal Crop Insurance Corporation.

[F.R. Doc. 65-13940; Filed, Dec. 29, 1965; 8:49 a.m.]

PART 401—FEDERAL CROP INSURANCE

Subpart—Regulations for the 1961 and Succeeding Crop Years

APPENDIX; COUNTIES DESIGNATED FOR SOYBEAN CROP INSURANCE

Pursuant to authority contained in § 401.1 of the above-identified regulations, as amended, the following counties are hereby added to the list of counties published October 28, 1965 (30 F.R. 13689), which were designated for soybean crop insurance for the 1966 crop year.

ALABAMA
Escambia.

ARKANSAS
Chicot. Desha.

ILLINOIS
Brown. Peoria.
Henderson. Warren.
Kendall. Whiteside.
Knox.

INDIANA
Bartholomew. Newton.
Elkhart. Parke.
Hamilton.

IOWA
Cedar. Marion.
Clinton. Monona.
Harrison. Muscatine.
Henry. Taylor.
Louisa. Wapello.

KANSAS
Johnson.

KENTUCKY
Henderson. Union.

LOUISIANA
Caldwell.

MARYLAND
Caroline.

MISSISSIPPI
Carroll.

MISSOURI
Boone. Pemiscot.
Clinton. Randolph.
Dunklin. Stoddard.
Mississippi.

NORTH CAROLINA
Hyde.

OHIO

Fairfield.	Ottawa.

SOUTH CAROLINA

Aiken.	Bamberg.

(Secs. 506, 516, 52 Stat. 73, as amended, 77, as amended; 7 U.S.C. 1506, 1516)

[SEAL] JOHN N. LUFT,
Manager,
Federal Crop Insurance Corporation.

[F.R. Doc. 65-13950; Filed, Dec. 29, 1965; 8:50 a.m.]

PART 401—FEDERAL CROP INSURANCE

Subpart—Regulations for the 1961 and Succeeding Crop Years

APPENDIX; COUNTIES DESIGNATED FOR PEANUT CROP INSURANCE

Pursuant to authority contained in § 401.1 of the above-identified regulations, as amended, the following counties are hereby added to the list of counties published October 28, 1965 (30 F.R. 13689), which were designated for peanut crop insurance for the 1966 crop year. The type(s) on which insurance is offered in each county is shown opposite the county name.

ALABAMA

Barbour—runner.

GEORGIA

Ben Hill—runner, spanish, virginia.
Dooly—runner, spanish, virginia.
Thomas—runner, spanish, virginia.

NORTH CAROLINA

Pitt—virginia.

(Secs. 506, 516, 52 Stat. 73, as amended, 77, as amended; 7 U.S.C. 1506, 1516)

[SEAL] JOHN N. LUFT,
Manager,
Federal Crop Insurance Corporation.

[F.R. Doc. 65-13951; Filed, Dec. 29, 1965; 8:50 a.m.]

PART 401—FEDERAL CROP INSURANCE

Subpart—Regulations for the 1961 and Succeeding Crop Years

APPENDIX; COUNTIES DESIGNATED FOR RICE CROP INSURANCE

Pursuant to authority contained in § 401.1 of the above-identified regulations, as amended, the following counties are hereby added to the list of counties published October 28, 1965 (30 F.R. 13689), which were designated for rice crop insurance for the 1966 crop year.

ARKANSAS

Chicot.	Desha.

(Secs. 506, 516, 52 Stat. 73, as amended, 77, as amended; 7 U.S.C. 1506, 1516)

[SEAL] JOHN N. LUFT,
Manager,
Federal Crop Insurance Corporation.

[F.R. Doc. 65-13952; Filed, Dec. 29, 1965; 8:50 a.m.]

PART 401—FEDERAL CROP INSURANCE

Subpart—Regulations for the 1961 and Succeeding Crop Years

APPENDIX; COUNTIES DESIGNATED FOR SUGAR BEET CROP INSURANCE

Pursuant to authority contained in § 401.1 of the above-identified regulations, as amended, the following counties are hereby added to the list of counties published October 28, 1965 (30 F.R. 13691), which were designated for sugar beet crop insurance for the 1966 crop year.

COLORADO

Morgan.	Weld.

IDAHO

Minidoka.

MONTANA

Richland.	Yellowstone.

WASHINGTON

Grant.	Yakima.

(Secs. 506, 516, 52 Stat. 73, as amended, 77, as amended; 7 U.S.C. 1506, 1516)

[SEAL] JOHN N. LUFT,
Manager,
Federal Crop Insurance Corporation.

[F.R. Doc. 65-13953; Filed, Dec. 29, 1965; 8:50 a.m.]

PART 401—FEDERAL CROP INSURANCE

Subpart—Regulations for the 1961 and Succeeding Crop Years

APPENDIX; COUNTIES DESIGNATED FOR TOBACCO CROP INSURANCE

Pursuant to authority contained in § 401.1 of the above-identified regulations, as amended, the following counties are hereby added to the list of counties published October 28, 1965 (30 F.R. 13691, 14151), which were designated for tobacco crop insurance for the 1966 crop year. The type(s) of tobacco on which insurance is offered in each county is shown opposite the county name.

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Thomas	14

KENTUCKY

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Marshall	23, 31, 35
Taylor	31
Union	31, 36

MARYLAND

Anne Arundel	32

NORTH CAROLINA

Alexander	11a
Montgomery	11b
Wilkes	11a

TENNESSEE

Blount	31
Lawrence	31
Macon	31, 35

VIRGINIA

Franklin	11a, 21

WISCONSIN

Crawford	55
Richland	55

(Secs. 506, 516, 52 Stat. 73, as amended, 77, as amended; 7 U.S.C. 1506, 1516)

[SEAL] JOHN N. LUFT,
Manager,
Federal Crop Insurance Corporation.

[F.R. Doc. 65-13954; Filed, Dec. 29, 1965; 8:50 a.m.]

PART 401—FEDERAL CROP INSURANCE

Subpart—Regulations for the 1961 and Succeeding Crop Years

APPENDIX; COUNTIES DESIGNATED FOR CORN CROP INSURANCE

Pursuant to authority contained in § 401.1 of the above-identified regulations, as amended, the following counties are hereby added to the list of counties published October 28, 1965 (30 F.R. 13685, 14151), which were designated for corn crop insurance for the 1966 crop year.

ILLINOIS

Brown.	Peoria.
Henderson.	Warren.
Kendall.	Whiteside.
Knox.	

INDIANA

Bartholomew.	Newton.
Elkhart.	Parke.
Hamilton.	

IOWA

Cedar.	Marion.
Clinton.	Monona.
Harrison.	Muscatine.
Henry.	Taylor.
Louisa.	Wapello.

KENTUCKY

Henderson.	Union.

MARYLAND

Caroline.

MICHIGAN

Cass.	Livingston.

MISSOURI

Boone.	Pemiscot.
Clinton.	Randolph.
Dunklin.	Stoddard.
Mississippi.	

NORTH CAROLINA

Hyde.	Rowan.

OHIO

Fairfield.	Ottawa.

SOUTH DAKOTA

Aurora.	Douglas.
Charles Mix.	

WISCONSIN

Crawford.	Richland.

(Secs. 506, 516, 52 Stat. 73, as amended, 77, as amended; 7 U.S.C. 1506, 1516)

[SEAL] JOHN N. LUFT,
Manager,
Federal Crop Insurance Corporation.

[F.R. Doc. 65-13955; Filed, Dec. 29, 1965; 8:50 a.m.]

PART 401—FEDERAL CROP INSURANCE

Subpart—Regulations for the 1961 and Succeeding Crop Years

APPENDIX; COUNTIES DESIGNATED FOR OAT CROP INSURANCE

Pursuant to authority contained in § 401.1 of the above-identified regulations, as amended, the following counties are hereby added to the list of counties published October 28, 1965 (30 F.R. 13688), which were designated for oat crop insurance for the 1966 crop year.

IOWA

Cedar.	Marion.
Clinton.	Monona.
Harrison.	Muscatine.
Henry.	Taylor.
Louisa.	Wapello.

SOUTH DAKOTA

Aurora.	Douglas.
Charles Mix.	

WISCONSIN

Crawford.	Richland.

(Secs. 506, 516, 52 Stat. 73, as amended, 77, as amended; 7 U.S.C. 1506, 1516)

[SEAL] JOHN N. LUFT,
Manager,
Federal Crop Insurance Corporation.

[F.R. Doc. 65-13956; Filed, Dec. 29, 1965; 8:50 a.m.]

PART 401—FEDERAL CROP INSURANCE

Subpart—Regulations for the 1961 and Succeeding Crop Years

APPENDIX; COUNTIES DESIGNATED FOR BARLEY CROP INSURANCE

Pursuant to authority contained in § 401.1 of the above-identified regulations, as amended, the following counties are hereby added to the list of counties published March 4, 1965 (30 F.R. 2781), which were designated for barley crop insurance for the 1966 crop year.

NORTH DAKOTA

Mercer.	Oliver.

(Secs. 506, 516, 52 Stat. 73, as amended, 77, as amended; 7 U.S.C. 1506, 1516)

[SEAL] JOHN N. LUFT,
Manager,
Federal Crop Insurance Corporation.

[F.R. Doc. 65-13958; Filed, Dec. 29, 1965; 8:50 a.m.]

PART 401—FEDERAL CROP INSURANCE

Subpart—Regulations for the 1961 and Succeeding Crop Years

APPENDIX; COUNTIES DESIGNATED FOR GRAIN SORGHUM CROP INSURANCE

Pursuant to authority contained in § 401.1 of the above-identified regulations, as amended, the following counties are hereby added to the list of counties published October 28, 1965 (30 F.R. 13687), which were designated for grain sorghum crop insurance for the 1966 crop year.

TEXAS

Calhoun.	Victoria.

(Secs. 506, 516, 52 Stat. 73, as amended, 77, as amended; 7 U.S.C. 1506, 1516)

[SEAL] JOHN N. LUFT,
Manager,
Federal Crop Insurance Corporation.

[F.R. Doc. 65-13959; Filed, Dec. 29, 1965; 8:50 a.m.]

PART 401—FEDERAL CROP INSURANCE

Subpart—Regulations for the 1961 and Succeeding Crop Years

APPENDIX; COUNTY DESIGNATED FOR PEA (DRY) CROP INSURANCE

Pursuant to authority contained in § 401.1 of the above-identified regulations, as amended, the following county is hereby added to the list of counties published October 28, 1965 (30 F.R. 13689), which were designated for pea (dry) crop insurance for the 1966 crop year.

WASHINGTON

Columbia.

(Secs. 506, 516, 52 Stat. 73, as amended, 77, as amended; 7 U.S.C. 1506, 1516)

[SEAL] JOHN N. LUFT,
Manager,
Federal Crop Insurance Corporation.

[F.R. Doc. 65-13960; Filed, Dec. 29, 1965; 8:50 a.m.]

PART 403—PEACH CROP INSURANCE

Subpart—Regulations for the 1965 and Succeeding Crop Years

APPENDIX; COUNTIES DESIGNATED FOR PEACH CROP INSURANCE

Pursuant to authority contained in § 403.40 of the above-identified regulations, as amended, the following counties are hereby added to the list of counties published October 28, 1965 (30 F.R. 13692), which were designated for peach crop insurance for the 1966 crop year.

NORTH CAROLINA

Montgomery.

SOUTH CAROLINA

Aiken.

(Secs. 506, 516, 52 Stat. 73, as amended, 77, as amended; 7 U.S.C. 1506, 1516)

[SEAL] JOHN N. LUFT,
Manager,
Federal Crop Insurance Corporation.

[F.R. Doc. 65-13957; Filed, Dec. 29, 1965; 8:50 a.m.]

PART 408—NORTH CAROLINA APPLE CROP INSURANCE

Subpart—Regulations for the 1965 and Succeeding Crop Years

APPENDIX; COUNTIES DESIGNATED FOR APPLE CROP INSURANCE

Pursuant to authority contained in § 408.1 of the above-identified regulations, as amended, the following counties are hereby added to the list of counties published October 28, 1965 (30 F.R. 13692), which were designated for apple crop insurance for the 1966 crop year.

NORTH CAROLINA

Alexander.	Wilkes.

(Secs. 506, 516, 52 Stat. 73, as amended, 77, as amended; 7 U.S.C. 1506, 1516)

[SEAL] JOHN N. LUFT,
Manager,
Federal Crop Insurance Corporation.

[F.R. Doc. 65-13940; Filed, Dec. 29, 1965; 8:49 a.m.]

Chapter VII—Agricultural Stabilization and Conservation Service (Agricultural Adjustment), Department of Agriculture

[Amdt. 19]

PART 724—BURLEY, FLUE-CURED, FIRE-CURED, DARK AIR-CURED, VIRGINIA SUN-CURED, CIGAR-BINDER (TYPES 51 AND 52), CIGAR FILLER AND BINDER (TYPES 42, 43, 44, 53, 54 AND 55), AND MARYLAND TOBACCO

Subpart—Tobacco Allotment and Marketing Quota Regulations, 1963–64 and Subsequent Marketing Years

MISCELLANEOUS AMENDMENTS

Correction

In F.R. Doc. 65-13484, appearing at page 15571 of the issue for Friday, December 17, 1965, the following corrections are made:

1. In the second sentence of § 724.62 (a)(2), "paragraph (c)" should read "paragraph (q)".

2. Section 724.69(b)(8) should end with the words "in the base period" instead of with the words "is the base period".

3. Section 724.69(g)(1) should end with the words "lessee farm" instead of with the words "leasee farm".

Chapter IX—Consumer and Marketing Service (Marketing Agreements and Orders; Fruits, Vegetables, Nuts), Department of Agriculture

[971.308 Amdt. 1]

PART 971—LETTUCE GROWN IN LOWER RIO GRANDE VALLEY IN SOUTH TEXAS

Limitation of Shipments

Correction

In F.R. Doc. 65-13543 appearing at page 15655 in the issue for Saturday, December 18, 1965, the second line of § 971.308(c)(1) now reads: "* * * 10 inches x 14¼ inches x $\frac{5}{16}$ inches * * *" It is corrected to read: "* * * 10 inches x 14¼ inches x 21$\frac{5}{16}$ inches * * *".

Chapter XIV—Commodity Credit Corporation, Department of Agriculture

[Cotton Loan Program Reg., Amdt. 1]

SUBCHAPTER B—LOANS, PURCHASES, AND OTHER OPERATIONS

PART 1427—COTTON

Subpart—Cotton Loan Program Regulations

WEIGHT, LOAN RATE, AND AMOUNT

Correction

In F.R. Doc. 65-13673, appearing at page 15795 of the issue for Wednesday, December 22, 1965, the following corrections are made in § 1427.1359(b):

1. In subparagraph (2), "staple of length" should read "staple length".
2. In subparagraph (3), "notes" should read "motes".

Title 9—ANIMALS AND ANIMAL PRODUCTS

Chapter I—Agricultural Research Service, Department of Agriculture

SUBCHAPTER C—INTERSTATE TRANSPORTATION OF ANIMALS AND POULTRY

PART 78—BRUCELLOSIS

Slaughtering Establishments

Pursuant to the provisions of sections 4, 5, and 13 of the Act of May 29, 1884, as amended, sections 1 and 2 of the Act of February 2, 1903, as amended, section 3 of the Act of March 3, 1905, as amended, and section 3 of the Act of July 2, 1962 (21 U.S.C. 111-113, 114a-1, 120, 121, 125, 134b), paragraph (b) of § 78.15 of the regulations in Part 78, Title 9, Code of Federal Regulations, restricting the interstate movement of domestic animals because of brucellosis, is hereby amended to read as follows:

§ 78.15 Slaughtering establishments.

* * * * *

(b) Notices containing lists of slaughtering establishments specifically approved for the purposes of § 78.5; paragraph (b) of § 78.12; and §§ 78.18 and 78.19 are published in the FEDERAL REGISTER. Information with respect to these slaughtering establishments may also be obtained from the Division and from the Federal Inspectors and State Inspectors.

(Secs. 4, 5, 23 Stat. 32, as amended, secs. 1, 2, 32 Stat. 791-792, as amended, sec. 3, 33 Stat. 1265, as amended, sec. 2, 65 Stat. 693; sec. 3, 76 Stat. 130; 21 U.S.C. 111-113, 114a-1, 120, 121, 125, 134b; 29 F.R. 16210, as amended; 9 CFR 78.16)

Effective date. The foregoing amendment shall become effective upon publication in the FEDERAL REGISTER.

This amendment clarifies the regulations in Part 78 by making specific reference in § 78.15(b) to the notices regarding specific approval of slaughtering establishments for the purposes of §§ 78.18 and 78.19 and should be made effective promptly in order to accomplish its purpose in the public interest. Accordingly, under section 4 of the Administrative Procedure Act (5 U.S.C. 1003), it is found upon good cause that notice and other public procedure with respect to the amendment are impracticable and contrary to the public interest, and good cause is found for making the amendment effective less than 30 days after publication in the FEDERAL REGISTER.

Done at Washington, D.C., this 27th day of December 1965.

E. P. REAGAN,
Acting Administrator,
Agricultural Research Service.

[F.R. Doc. 65-13938; Filed, Dec. 29, 1965; 8:48 a.m.]

Title 14—AERONAUTICS AND SPACE

Chapter I—Federal Aviation Agency

[Airspace Docket No. 65-EA-32]

PART 71—DESIGNATION OF FEDERAL AIRWAYS, CONTROLLED AIRSPACE, AND REPORTING POINTS

Alteration of Transition Area

Correction

In F.R. Doc. 65-12943, appearing at page 14968 of the issue for Friday, December 3, 1965, the following correction is made in item 1: The heading for the description of the Charleston, W. Va., control zone should read "Charleston, W. Va." instead of "Charlestown, W. Va."

Title 24—HOUSING AND HOUSING CREDIT

Chapter II—Federal Housing Administration, Department of Housing and Urban Development

SUBCHAPTER A—GENERAL

PART 200—INTRODUCTION

Subpart D—Delegations of Basic Authority and Functions

MISCELLANEOUS AMENDMENTS

In § 200.56 paragraph (f) is amended to read as follows:

§ 200.56 Assistant Commissioner for Home Mortgages.

* * * * *

(f) To direct the activities of the Mortgage Servicing Officer and the Special Assistant for Home Improvement Program.

In § 200.73 the introductory text of (a) and (a)(4) are amended to read as follows:

§ 200.73 Director, Audit and Examination.

* * * * *

(a) To be responsible for the coordination and general supervision of the Audit Division, the Examination Division, and the Mortgagee Approval Section comprising the following functions:

* * * * *

(4) Review and recommendation to the Assistant Commissioner for Home Mortgages of approval, disapproval, or cancellation of approval of financial institutions as approved mortgagees and of firms or individuals as authorized agents for approved mortgagees.

* * * * *

(Sec. 2, 48 Stat. 1246, as amended; sec. 211, 52 Stat. 23, as amended; sec. 607, 55 Stat 61, as amended; sec. 712, 62 Stat. 1281, as amended; sec. 907, 65 Stat. 301, as amended; sec. 807, 69 Stat. 651, as amended; 12 U.S.C. 1703, 1715b, 1742, 1747k, 1748f, 1750f)

Issued at Washington, D.C., December 23, 1965.

[SEAL] PHILIP N. BROWNSTEIN,
Federal Housing Commissioner.

[F.R. Doc. 65-13937; Filed, Dec. 29, 1965; 8:48 a.m.]

Title 31—MONEY AND FINANCE: TREASURY

Chapter II—Fiscal Service, Department of the Treasury

SUBCHAPTER A—BUREAU OF ACCOUNTS

PART 209—DRAWING OF CHECKS IN FAVOR OF FINANCIAL ORGANIZATIONS FOR THE CREDIT OF PERSONS' ACCOUNTS

On November 4, 1965, notice of proposed rule making regarding the adoption of regulations, pursuant to section 3620 of the Revised Statutes (31 U.S.C. 492), as amended by Public Law 89-145 (79 Stat. 582), to govern the drawing of checks in favor of financial organizations for the credit of persons' accounts was published in the FEDERAL REGISTER (30 F.R. 13955). The regulations proposed apply to checks in payment of (1) salaries or wages, and (2) other classes of recurring payments with specific approval of the Fiscal Assistant Secretary of the Treasury. After consideration of all such relevant matter as was presented by interested persons regarding the rules proposed, the regulations under section 3620 of the Revised Statutes, as amended by Public Law 89-145, are hereby adopted to read as follows:

Sec.

209.1 Authority.
209.2 Definitions.
209.3 Individual checks.
209.4 Composite checks.
209.5 Depositor account numbers.
209.6 Assignments prohibited.
209.7 Financial organization as agent.
209.8 Acquittance to United States.
209.9 Financial organization not Government depositary.
209.10 Procedural instructions.

AUTHORITY: The provisions of this Part 209 issued under R.S. 3620, as amended by Pub. L. 89-145; 31 U.S.C. 492, unless otherwise noted.

SOURCE: The provisions of this Part 209 appear at F.R. ———, December 30, 1965, unless otherwise noted, and are contained in Treasury Department Circular No. 1076, dated December 22, 1965.

§ 209.1 Authority.

This part is issued pursuant to section 3620 of the Revised Statutes (31 U.S.C. 492), as amended by Public Law 89-145 (79 Stat. 582). Public Law 89-145 further amended section 3620 of the Revised Statutes to provide additional methods of payment by permitting the heads of agencies to authorize disbursing officers to make certain payments by checks drawn in favor of financial organizations under certain conditions.

§ 209.2 Definitions.

As used in this part:

(a) "Agency" means any department, agency, independent establishment, board, office, commission or other establishment in the executive, legislative, or judicial branch of the Government, any wholly owned or controlled Government corporation, and the municipal government of the District of Columbia;

(b) "Financial organization" means any bank, savings bank, savings and loan association or similar institution, or Federal or State-chartered credit union.

§ 209.3 Individual checks.

(a) The head of an agency may authorize the appropriate disbursing officer to pay a person by sending to the financial organization designated by that person a check that is drawn in favor of that organization and for credit to the account of that person.

(b) The procedure set out in paragraph (a) of this section may be adopted only:

(1) If the person to whom payment is to be made provides the agency with a written request (on a form promulgated by the Treasury [1] or such agency-adapted form as may be approved by the Treasury for the purpose) which designates the financial organization and such financial organization, by endorsement thereon, states its willingness to act in this respect as agent of such person;

(2) For payments for credit to any account (single or joint) designated by the person to whom payment is to be made, the title of which includes the name of that person as stated on the check;

(3) If the head of the agency makes a determination that the interests of the Government, from the standpoint of economy or otherwise, and of the person to whom payment is to be made, will not be impaired;

(4) For payments of salaries or wages (including military or other pay and allowances) and, with the specific approval of the Fiscal Assistant Secretary of the Treasury, for other classes of recurring payments; and

(5) For agencies serviced by Treasury regional disbursing offices, after such consultation with the Bureau of Accounts as is necessary to coordinate the agency's operations with disbursing office requirements.

§ 209.4 Composite checks.

(a) Whenever, under the procedure set out in § 209.3, payments may be made by an agency on the same regularly recurring dates to two or more persons who designate the same financial organization, the head of the agency may, with the approval specified in paragraph (b) of this section or upon the determination specified in paragraph (c) of this section, as the case may be, authorize the appropriate disbursing officer to draw a single check for the total amount in favor of that organization for credit to the accounts of the several persons.

(b) An agency serviced by Treasury regional disbursing offices desiring to use the procedure set out in paragraph (a) of this section may, after consultation with the Bureau of Accounts regarding its requirements, submit through that Bureau a request for approval by the Fiscal Assistant Secretary of the Treasury. The request shall be accompanied by findings as to the effect of the procedure on the agency's costs. The approval of the Fiscal Assistant Secretary will be contingent on his determining that economy will result, considering the effect of the procedure on Government-wide costs for each application.

(c) An agency which does its own disbursing or disburses by delegation from the Treasury may use the procedure set out in paragraph (a) of this section if the head of the agency makes a determination that, in accordance with standards prescribed in regulations of the agency concurred in by the Fiscal Assistant Secretary of the Treasury, economy will result. Agency regulations shall provide for taking Government-wide costs into account for each application of the procedure, including costs of the agency's internal operations and other Government costs determined by the Treasury.

(d) An agency which uses the procedure set out in paragraph (a) of this section shall supply to the disbursing office, or arrange to have the disbursing office prepare, for forwarding to each financial organization with each check, a record which as a minimum states the name and location of the agency payrolling office; the name and address of the financial organization office to receive the check; the name and amount for each account to be credited; and the date and aggregate amount to be covered by the composite check.

§ 209.5 Depositor account numbers.

At the request of a financial organization to which checks are sent under the procedures set out in §§ 209.3 and 209.4, an agency shall, to the extent practicable, use depositor account numbers supplied by the financial organization as additional identification on individual checks or on the records accompanying composite checks. The United States shall not assume responsibility for the correctness of such account numbers and the name of the person to whom payment is to be made will govern the crediting of the account.

§ 209.6 Assignments prohibited.

The procedures set out in §§ 209.3 and 209.4 may not be used for allotting a part of a payment or for effectuating an assignment of a payment. Nothing in this part affects allotments of payments specifically authorized by other provisions of law and regulations thereunder.

§ 209.7 Financial organization as agent.

A financial organization which receives checks under the procedure set out in §§ 209.3 and 209.4 does so in each case as the agent of the person who has designated the financial organization to receive the check and credit his account. The death of that person revokes the authority of the financial organization to credit the amount to the account of that person. In the case of a check covering a payment to one person, the proceeds of which cannot be credited to the account because of death or any other reason, the financial organization shall promptly return the check to the issuing disbursing officer or remit its own check in an equal amount, with a statement in either case identifying the reason therefor and the person. In the case of a check covering payment to more than one person, a portion of which cannot be credited to an account because of death or for any other reason, the financial organization shall promptly remit to the agency responsible for making payment a check in an amount equal to that portion which could not be properly credited to the account, with a statement identifying the person and the reason for refund.

§ 209.8 Acquittance to the United States.

Payment by the United States of a check drawn in favor of and properly endorsed by the financial organization designated by a person to whom payment is to be made shall, if the check or the accompanying document properly specifies that person's name, constitute a full acquittance to the United States for the amount of such payment.

§ 209.9 Financial organization not Government depositary.

A financial organization to which a check is drawn under the procedure set out in §§ 209.3 and 209.4 does not thereby become a Government depositary and shall not advertise itself as one because of that fact.

§ 209.10 Procedural instructions.

Procedural instructions for the guidance of agencies in the implementation of these regulations, as needed, will be issued by the Commissioner of Accounts, including promulgation of applicable forms.

[SEAL] JOHN K. CARLOCK,
Fiscal Assistant Secretary.

[F.R. Doc. 65-14006; Filed, Dec. 29, 1965; 8:50 a.m.]

[1] Standard Form 1189 attached to Department Circular 1076, dated Dec. 22, 1965, filed as part of original document.

Title 32—NATIONAL DEFENSE

Chapter VI—Department of the Navy

SUBCHAPTER C—PERSONNEL

PART 719—NONJUDICIAL PUNISHMENT, NAVAL COURTS, AND CERTAIN FACT-FINDING BODIES

SUBCHAPTER E—CLAIMS

PART 750—NAVY GENERAL CLAIMS

PART 751—NAVY PERSONNEL CLAIMS

Miscellaneous Amendments

Scope and purpose. Parts 719, 750, and 751 are updated to conform to amendments to the Manual of the Judge Advocate General which will be distributed in due course to Navy and Marine Corps commands as Changes 15 and 16 to that manual.

1. Section 719.101 is amended by revising paragraph (f)(2) through the end of paragraph (f) and by revising paragraph (g) to read as follows:

§ 719.101 General provisions.

* * * * *

(f) *Appeals*—* * *

(2) *To whom made when officer who imposed the punishment is in a Navy chain of command.* Any appeal from nonjudicial punishment in accordance with paragraph 135, MCM 1951, shall, in the absence of specific direction to the contrary by an officer authorized to convene general courts-martial and superior in the chain of command to the officer who imposed the punishment, be forwarded to the area coordinator authorized to convene general courts-martial. When the cognizant area coordinator is not superior in rank or command to the officer who imposed the punishment, however, or when the punishment is imposed by a commanding officer who is an area coordinator, the appeal shall be forwarded to the officer authorized to convene general courts-martial and next superior to the officer who imposed the punishment in the chain of command.

(i) An immediate or delegated area coordinator may take action in lieu of an area coordinator if he is superior in rank or command to the officer who imposed the punishment and has authority to convene general courts-martial.

(ii) For mobile units, the area coordinator for the above purpose is the area coordinator most accessible to the unit at the time of forwarding of the appeal.

(3) *To whom made when officer who imposed the punishment is in the chain of command of the Commandant of the Marine Corps.* Any appeal from nonjudicial punishment in accordance with paragraph 135, MCM 1951, shall be made to the authority next superior in the chain of command to the officer who imposed the punishment, whether or not the superior authority is at the time of appeal in the chain of command of the person punished.

(4) *Appeal from nonjudicial punishment in multiservice commands under paragraph (a)(1) of this section.* An appeal from nonjudicial punishment imposed by a commanding officer designated pursuant to paragraph (a)(1) of this section shall be made to the Chief of Naval Operations or the Commandant of the Marine Corps, as appropriate.

(5) *Delegation of authority to act on appeals.* Such authority may be delegated in accordance with the provisions of paragraph (a)(4) of this section.

(6) *Reforwarding of appeal.* An officer who has delegated his nonjudicial punishment powers to a principal assistant under paragraph (a)(4) of this section may not act on appeal from punishment imposed by his delegate. In such cases and in other cases where it may be inappropriate for the officer designated by subparagraph (2) or (3) of this paragraph to act on the appeal, as where an identity may exist of persons or staff with the command which imposed the punishment, such fact may be noted in reforwarding the appeal to the next superior in the chain of command of the officer who imposed the punishment.

(7) *Procedures.* When the officer who imposed the punishment is not the offender's immediate commanding officer, the latter may forward the appeal direct to the officer who imposed the punishment for forwarding under subparagraph (2), (3) or (4) of this paragraph. Similarly, the action of the superior on appeal may be forwarded by the officer who imposed the punishment direct to the offender's commanding officer for delivery. Copies of the correspondence should be provided for any intermediate authorities in the chain of command. In any case where nonjudicial punishment is imposed on the basis of information contained in the record of a court of inquiry or factfinding body, a copy of the record, including the findings, opinions, and recommendations, together with copies of endorsements thereon, shall, except where the interests of national security may be adversely affected, be made available to the individual concerned for his examination in connection with the preparation of an appeal. In case of doubt, the matter shall be referred to the Judge Advocate General for advice.

(g) *Records of punishment*—(1) The records of nonjudicial punishment will be maintained and disposed of in accordance with paragraph 133c, MCM 1951, as amended, and implementing regulations contained in the Bureau of Naval Personnel Manual and the Marine Corps Personnel Manual. The forms used for the Unit Punishment Book are NAVPERS 2696 and NAVMC 10132PD.

(2) Effective July 1, 1965, section B of NAVJAG Form 425 (Rev. 4-65) will be prepared by general court-martial authorities for semiannual submission to the Judge Advocate General, Navy Department, Washington, D.C., 20350. NAVJAG Form 425A (5-63) is obsolete. The first semiannual report to be submitted on section B of NAVJAG Form 425 (Rev. 4-65) should cover the period July 1, 1965, to December 31, 1965. Supplies of this form are available in the Forms and Publications Segment of the Navy Supply System under Stock Number 0105-100-0302. A sample form is set forth in § 719.221.

* * * * *

2. Section 719.102 is amended by revising the next to last paragraph of paragraph (e)(4) and by revising paragraph (f)(3) to read as follows:

§ 719.102 Letters of censure.

* * * * *

(e) *Content of letter*—* * *

(4) *Notification of right to appeal and right to submit statement.* * * *

If, upon full consideration, you do not desire to avail yourself of this right to appeal, you are directed so to inform your commanding officer in writing. You are directed to reply without delay and to state therein the date of receipt of this communication, and the approximate time when either an appeal or notice of decision not to appeal may be expected. Any subsequent request for additional time shall contain adequate justification therefor.

* * * * *

(f) *Appeals.* * * *

(3) Appeals from a letter of admonition or reprimand imposed as nonjudicial punishment shall be forwarded as specified in § 719.101f.

* * * * *

3. Section 719.103 is amended by revising paragraph (a)(2), redesignating paragraph (b)(10) as (b)(11) and revising it, and adding a new (b)(10) to read as follows:

§ 719.103 Designation of additional convening authorities.

(a) *General courts-martial.* * * *

(2) The following officers are specifically designated as empowered to convene general courts-martial:

Chief of Naval Operations.
Commandant of the Marine Corps.
Commander, Service Group One.
Commander, Service Force, Sixth Fleet.
Commanders, Fleet Air Wings.
Commanders, Fleet Air Commands.
Commander, Morocco—U.S. Naval Training Command.
Commanding Officer, U.S. Naval Support Activity, Naples.
Commander, U.S. Naval Activities, Spain.
Commanding Officer, Camp Butler, Okinawa.
Commander, U.S. Naval Training Center, Bainbridge, Md.
Commander, U.S. Naval Training Center, Great Lakes, Ill.
Commander, U.S. Naval Training Center, San Diego, Calif.

* * * * *

(b) *Special courts-martial.* * * *

(10) All Inspector-Instructors, Marine Corps Reserve Organizations.

(11) The following specifically designated officers:

Director, U.S. Naval Research Laboratory, Washington, D.C.
Administrative Officer, U.S. Naval Supply Center, Pearl Harbor, Hawaii.
Director, Administrative Services Department, U.S. Naval Supply Center, Oakland, Calif.
Administrative Officer, U.S. Naval Supply Depot, Seattle, Wash.

Head, Military Personnel Department, U.S. Naval Station, San Diego, Calif.
Head, Military Personnel Department, U.S. Naval Station, Treasure Island, San Francisco, Calif.
Head, Military Personnel Department, U.S. Naval Station, Norfolk, Va.

* * * * *

4. Section 719.107 is revised to read as follows:

§ 719.107 Superior competent authority defined.

(a) *Accuser in a Navy chain of command.* Whenever an accuser forwards charges pursuant to articles 22(b) and 23(b) of the Code, the "superior competent authority" as used in those articles is, in the absence of specific direction to the contrary by an officer authorized to convene general courts-martial and superior in the chain of command to such accuser, the area coordinator authorized to convene general or special courts-martial, as appropriate. For mobile units, the area coordinator for the above purpose is the area coordinator most accessible to the mobile unit at the time of forwarding of the charges. When the cognizant area coordinator is not superior in rank or command to the accuser, however, or when the accuser is an area coordinator, or if it is otherwise impossible or impracticable to forward the charges as specified above, they shall be forwarded to any superior officer exercising the appropriate court-martial jurisdiction (see par. 33i, MCM 1951). An immediate or delegated area coordinator may receive the charges in lieu of the area coordinator if he is authorized to convene the appropriate court-martial and is superior in rank or command to the accuser.

(b) *Accuser in the chain of command of the Commandant of the Marine Corps.* Whenever an accuser forwards charges pursuant to articles 22(b) and 23(b) of the Code, the "superior competent authority" as used in those articles is defined as any superior officer in the chain of command authorized to convene a special or general court-martial, as appropriate. If such an officer is not reasonably available, or if it is otherwise impossible or impracticable to so forward the charges, they shall be forwarded to any superior officer exercising the appropriate court-martial jurisdiction (see par. 33i, MCM 1951).

5. Section 719.111 is amended by revising the caption and by adding paragraphs (c) and (d) to read as follows:

§ 719.111 Preparation and forwarding of charges.

* * * * *

(c) *Forwarding of charges by an officer in a Navy chain of command—(1) General court-martial cases.* When a commanding officer, in taking action on charges, deems trial by general court-martial to be appropriate, but he is not authorized to convene such court or finds the convening of such court impracticable, the charges and necessary allied papers will, in the absence of specific direction to the contrary by an officer authorized to convene general courts-martial and superior in the chain of command to such commanding officer, be forwarded to the area coordinator actively exercising general court-martial jurisdiction. For mobile units, the area coordinator for the above purposes is such area coordinator most accessible to the mobile unit at the time of forwarding of the charges. See § 719.107 for additional provisions in cases in which the forwarding officer is an accuser. An immediate or delegated area coordinator may receive the charges in lieu of the area coordinator if he is actively exercising general court-martial jurisdiction.

(2) *Special and summary court-martial cases.* When an officer in command or in charge, in taking action on charges, deems trial by special or summary court-martial to be appropriate, but he is not authorized to convene such courts-martial, the charges and necessary allied papers will be forwarded to the superior in the chain of command authorized to convene the type of court-martial deemed appropriate unless an officer authorized to convene general courts-martial and superior in the chain of command to such officer in command or charge, on the basis of a local arrangement with the area coordinator, has directed that such cases be forwarded to the area coordinator. For mobile units, the area coordinator for the above purposes is the area coordinator most accessible to the mobile unit at the time of forwarding of the charges. See § 719.107 for additional provisions in cases in which the forwarding officer is an accuser. Subject to the terms of the local arrangement, forwarding to the area coordinator may also be resorted to even though the immediate or superior commanding officer of the accused is authorized to convene the type of court-martial deemed appropriate but finds such action impracticable. An immediate or delegated area coordinator may receive the charges in lieu of the area coordinator if he is authorized to convene the type of court-martial deemed appropriate.

(d) *Forwarding of charges by an officer in the chain of command of the Commandant of the Marine Corps.* When a commander, in taking action on charges, deems trial by general, special or summary court-martial to be appropriate, but he is not empowered to convene a court as deemed appropriate for the trial of the case, the officer will forward the charges and necessary allied papers through the chain of command to an officer exercising the kind of court-martial jurisdiction deemed appropriate. See paragraphs 32f and 33i, MCM 1951; see also § 719.107 for additional provisions in cases in which the forwarding officer is an accuser.

6. Section 719.114 is amended by revising paragraph (a)(6) to read as follows:

§ 719.114 Preparation of records of trial.

(a) *General and special courts-martial.* * * *

(6) *Court-Martial Chronology/Prisoner Data Form, NAVJAG 420 (Rev. 5–65).* As provided in §§ 719.121a(a) and 719.226, this form will be prefixed to the originals of all records of trial by general court-martial and all records of trial by special court-martial which include a bad conduct discharge.

* * * * *

7. Section 719.118 is amended by revising paragraph (a)(4) to read as follows:

§ 719.118 Promulgating orders.

(a) *General and special courts-martial—* * * *

(4) *Form.* The form of a promulgating order is prescribed in appendix 15, MCM 1951. In copying and including the action of the convening authority in the promulgating order, any synopsis of the accused's record and/or circumstances of the offense contained in the convening authority's action pursuant to § 719.117(c) and/or § 719.117(f) shall also be copied and included in the promulgating order. The order shall be subscribed by the officer issuing the order or by a subordinate officer designated by him. In either case the name, grade, and title of the subscribing officer, including his organization or unit, shall be given. Where a subordinate officer signs by direction, his name, title, and organization shall be followed by the words: "By direction of (name, grade, title, and organization of issuing officer)." Duplicate originals of promulgating orders are copies personally subscribed by the officer who subscribed the original. Certified copies of promulgating orders are copies bearing the statement: "Certified to be a true copy," over the signature, grade and title of an officer.

* * * * *

8. Section 719.119 is amended by revising paragraphs (a)(2) and (b)(2) to read as follows:

§ 719.119 Review of summary and special courts-martial.

(a) *Summary courts-martial and special courts-martial not involving a bad conduct discharge—* * * *

(2) *Selection of supervisory authorities.* (i) It is the policy of the Department of the Navy that review of cases pursuant to paragraph 94a(2), MCM 1951, will be accomplished in the field, unless compelling reasons exist for forwarding the record or records to the Judge Advocate General for review.

(*a*) For commands in a Navy chain of command, review pursuant to paragraph 94a(2), MCM 1951, will be accomplished, if practicable, and in the absence of specific direction to the contrary by an officer authorized to convene general courts-martial and superior in the chain of command to the convening authority, by the area coordinator authorized to convene general courts-martial. For mobile units, the area coordinator for this purpose is the area coordinator most accessible to the mobile unit at the time of forwarding of the record. An immediate or delegated area coordinator may take action in lieu of an

area coordinator if he has authority to convene general courts-martial.

(b) For commands in the chain of command of the Commandant of the Marine Corps, review pursuant to paragraph 94a(2), MCM 1951, will be accomplished within the chain of command if practicable.

If such accomplishment of the review is found not practicable, any officer having supervisory authority in the field may be requested to accept records of such cases and to act thereon pursuant to paragraph 94a(2), MCM 1951. Only if all reasonably available officers having supervisory authority in the field find it impracticable to grant such request will the records in such cases be forwarded to the Judge Advocate General for review. If so forwarded to the Judge Advocate General, they shall be accompanied by a letter stating the reasons why supervisory authority action was not accomplished in the field.

(ii) When an officer exercising general court-martial jurisdiction is the convening authority of a summary court-martial or a special court-martial not involving a bad conduct discharge, his action thereon will be as convening authority only.

(a) At activities in a Navy chain of command, the record should then be forwarded, in the absence of specific direction to the contrary by a superior in the chain of command, to the area coordinator if superior in rank or command to the convening authority and authorized to convene general courts-martial; otherwise the record should be forwarded to any appropriate superior officer authorized to convene general courts-martial, or, if no such superior officer has a law specialist available, the record shall be forwarded to the Judge Advocate General for review. (For mobile units, the area coordinator for this purpose is the area coordinator most accessible to the mobile unit at the time of forwarding of the record.)

(b) At activities in the chain of command of the Commandant of the Marine Corps, the record should then be forwarded to an appropriate superior officer exercising general court-martial jurisdiction or, if no such superior officer has a law specialist available, the record shall be forwarded to the Judge Advocate General for review.

In all cases, the action of the convening authority in forwarding the record for supervisory review shall identify the officer to whom the record is forwarded by stating his official title, such as "The record of trial is forwarded to the Commandant, First Naval District, for action under article 65(c), Uniform Code of Military Justice."

* * * * *

(b) *Special courts-martial involving a bad conduct discharge*— * * *

(2) *Action by reviewing authority (officer exercising general court-martial jurisdiction).* In special court-martial cases where the sentence as approved by the convening authority who is not an officer exercising general court-martial jurisdiction includes a bad conduct discharge, review will be accomplished in accordance with paragraph 94a(3), MCM 1951.

(i) For activities in a Navy chain of command, and in the absence of specific direction to the contrary by an officer authorized to convene general courts-martial and superior in the chain of command to the convening authority, review will be accomplished by the area coordinator authorized to convene general courts-martial. For mobile units, the area coordinator for this purpose is the area coordinator most accessible to the mobile unit at the time of forwarding of the record. An immediate or delegated area coordinator may take action in lieu of an area coordinator if he has authority to convene general courts-martial. As indicated in this subdivision, a superior officer in the chain of command authorized to convene general courts-martial may direct otherwise; he may, e.g., direct that the records be forwarded to him for review.

(ii) For activities in the chain of command of the Commandant of the Marine Corps, review will be accomplished by the officer ordinarily exercising general court-martial jurisdiction over the command.

In the event review by any of the officers indicated in the foregoing part of this subparagraph is impracticable—for instance, because of the absence or lack of a staff legal officer—any other officer authorized to convene general courts-martial may be requested to accept records of trial for review. Only if all reasonably available officers exercising general court-martial jurisdiction find it impracticable to grant such request will the records be forwarded direct to the Judge Advocate General for review by a board of review. If so forwarded, they shall be accompanied by a letter stating the reasons why review under article 65(b) of the Code was not accomplished in the field.

* * * * *

9. Section 719.121a is added to read as follows:

§ 719.121a Preparation of court-martial statistical forms.

(a) *General court-martial cases and special court-martial cases involving a bad conduct discharge.* Effective January 1, 1966, all convening authorities and supervisory authorities, as appropriate, shall complete NAVJAG Form 420 (Rev. 5–65) during the review of all trials of general courts-martial and all trials of special courts-martial involving a bad conduct discharge. The form will be prefixed to the original records of trial. NAVJAG Form 420 (6–58) is obsolete. Supplies of NAVJAG Form 420 (Rev. 5–65) are available in the Forms and Publications Segment of the Navy Supply System under Stock Number 0105–100–0201. A form containing sample entries and the Punitive Article Identification Code to be used in completing the form are set forth in § 719.226.

(b) *Non-bad conduct discharge special courts-martial and summary courts-martial.* Effective July 1, 1965, section A of NAVJAG Form 425 (Rev. 4–65) will be prepared by each supervisory authority for semiannual submission to the Judge Advocate General, Navy Department, Washington, D.C., 20350. NAVJAG Form 425 (Rev. 1–60) is obsolete. The first semiannual report to be submitted on section A of NAVJAG Form 425 (Rev. 4–65) should cover the period July 1, 1965, to December 31, 1965. Supplies of NAVJAG Form 425 (Rev. 4–65) are available in the Forms and Publications Segment of the Navy Supply System under Stock Number 0105–100–0302. A sample form is set forth in § 719.227.

10. Section 719.122 is amended by revising paragraph (b) to read as follows:

§ 719.122 Remission and suspension.

* * * * *

(b) *Probationary period.* All suspensions shall be of the conditional-remission type and shall be for a definite period of time. If the suspension is effected by the convening authority or an officer exercising general court-martial jurisdiction over the command to which the accused is attached and is for a period in excess of 6 months, or, in cases involving confinement, in excess of 6 months beyond the time of release from confinement, see § 719.117(b) or § 719.120(a), as appropriate. The running of the period of suspension of a sentence is interrupted either by the unauthorized (and unexcused) absence of the probationer or by commencement of proceedings to vacate suspension of the sentence. The running of the period of suspension of a sentence resumes (1) as of the date the probationer's unauthorized (and unexcused) absence ends or (2) as of the initial date of the interruption if proceedings to vacate suspension of the sentence are concluded without vacation of the suspension. For instructions concerning voluntary extension of enlistment for the purpose of serving probation, see SECNAV Instruction 5815.3 and revisions thereto.

* * * * *

11. Section 719.134 is revised to read as follows:

§ 719.134 Court-martial forms.

(a) *List.* The forms listed in this paragraph are used in courts-martial by the naval service:

STD 1156	Public Voucher for Fees and Mileage of Witnesses.
STD 1157	Claim for Fees and Mileage of Witness.
DD 453	Subpoena for Civilian Witness.
DD 454	Warrant of Attachment.
DD 455	Report of Proceedings To Vacate Suspension.
DD 456	Interrogatories and Depositions.
DD 457	Investigating Officer's Report.
DD 458	Charge Sheet.
DD 490	Verbatim Record of Trial.
DD 491	Summarized Record of Trial.
DD 494	Court-Martial Data Sheet. (Optional.)
NAVJAG 420	Court-Martial Chronology/Prisoner Data.
NAVJAG 425	Statistical Report on Non-Board of Review and Article 15 Cases.

(b) *How to obtain forms.* The forms designated in paragraph (a) of this section are available from the Forms and Publications Segment of the Navy Supply System as Cognizance Symbol "I" material and may be obtained in accordance with the instructions contained in Navy Stock List of Forms and Publications, section 1, NAVSANDA Publication 2002. Marine Corps activities will requisition forms in accordance with instructions contained in the current edition of Marine Corps Order 4235.11, Subj.: Procedures incident to supply of blank forms and general officer stationery items.

(c) *Forms prescribed by MCM 1951.* Where forms are prescribed by the Manual for Courts-Martial, United States, 1951, but are not included in the listing in paragraph (a) of this section, convening authorities should improvise as necessary, using the manual and appendixes thereto as guides.

12. Section 719.139 is amended by revising paragraphs (a)(1)(ii) and (iii) and adding a new paragraph (a)(1)(iv) to read as follows:

§ 719.139 Authority to administer oaths and to act as notary.

(a) *Authority under article 136(a)(7) and (b)(6).* * * *

(1) * * *

(ii) Officers of the grade of Lieutenant Commander or Major, and above;

(iii) Executive Officers of the Navy and Marine Corps; and

(iv) Administrative Officers of Marine Corps Aviation Squadrons.

* * * * *

13. Section 719.157 is amended by designating the text of paragraph (b) as subparagraph (1) and by adding subparagraph (2) to read as follows:

§ 719.157 Rights of a party.

* * * * *

(b) *Right to counsel.* * * *

(2) When directing that an investigation be conducted, and the medical officer states that the member involved as a party is incompetent due to his injuries and will remain so for at least 60 days, the convening authority will insure that a qualified lawyer counsel is appointed to represent the party during the proceedings of the investigation and duly exercise all the rights of the party, as though he were present.

* * * * *

14. Section 719.221 is inserted to read as follows:

§ 719.221 Form for report on article 15 cases (see § 719.101(g)(2)).

NOTE: The report will be prepared as section B of NAVJAG Form 425 (Rev. 4-65). NAVJAG Form 425 filed as part of the original document.

15. Section 719.226 is inserted to read as follows:

§ 719.226 Form for court-martial chronology/prisoner data and punitive article identification code (see § 719.121a(a)).

NOTE: NAVJAG Form 420 (Rev. 5-65) and Punitive Article Identification Code filed as part of the original document.

16. Section 719.227 is inserted to read as follows:

§ 719.227 Form for statistical report on nonboard of review cases (see § 719.121a(b)).

NOTE: The form is section A of NAVJAG Form 425 (Rev. 4-65); section B of the form (relating to article 15 cases) is prescribed by § 719.221 and explained in § 719.101(g)(2). NAVJAG Form 425 filed as part of the original document.

17. Section 750.41 is amended by revising paragraphs (a)(8) and (b)(8) to read as follows:

§ 750.41 Approval of claims.

(a) *Federal tort claims.* * * *

(8) The commandant or the district legal officer of the naval district within which the claims arose or, if the claims arose in Guam, Commander, Naval Forces, Marianas, or his staff legal officer, if no claim arising from the accident or incident exceeds $1,000 and there are no known possible claims in any amount for either personal injury or death as a result of the accident or incident. One copy of the approval and one copy of the voucher shall be forwarded to the Judge Advocate General without a letter of transmittal.

* * * * *

(b) *Military Claims Act cases.* * * *

(8) The commandant or the district legal officer of the naval district within which the claims arose or, if the claims arose in Guam, Commander, Naval Forces, Marianas, or his staff legal officer, if no claim arising from the accident or incident exceeds $1,000 and there are no known possible claims in any amount for either personal injury or death as a result of the accident or incident.

* * * * *

18. Part 751 is amended by adding the following note below the "Authority" note:

NOTE: Part 751 is under revision to conform to the act of Sept. 15, 1965 (Pub. L. 89-185, 79 Stat. 789), which increases the maximum settlement authority from $6,500 to $10,000.

(R.S. 161, secs. 2671-2680, 62 Stat. 982-984, secs. 801-940, 2732, 2733, 5031, 70A Stat. 36-78, 152, 153, 278, E.O. 10214 (3 CFR 1949-53 Comp., p. 408), as amended; 5 U.S.C. 22, 10 U.S.C. 801-940, 2732, 2733, 5031, 28 U.S.C. 2671-2680)

By direction of the Secretary of the Navy.

[SEAL] WILFRED HEARN,
Rear Admiral, U.S. Navy, Judge Advocate General of the Navy.

DECEMBER 27, 1965.

[F.R. Doc. 65-13930; Filed, Dec. 29, 1965; 8:48 a.m.]

Chapter VII—Department of the Air Force

SUBCHAPTER W—AIR FORCE PROCUREMENT INSTRUCTION

MISCELLANEOUS REVISIONS TO SUBCHAPTER

Subpart W is amended as follows:

PART 1013—GOVERNMENT PROPERTY

Subpart D—Industrial Facilities

1. In § 1013.402-50 many of the references have been changed. The affected paragraphs are set forth as follows:

§ 1013.402-50 Provisions applicable to procurement contracts.

(a) *Facilities provided under cost-type procurement contracts.* (1) Where existing facilities are to be furnished under the terms of a cost-type procurement contract, no separate clauses covering such facilities are required other than the Government-furnished property clause set forth in §§ 13.703 or 13.707 of this title, whichever is applicable. The items of facilities will be listed or specified in the Schedule as Government-furnished property.

(2) Where the acquisition or fabrication of facilities is authorized in a cost-type contract, in addition to inserting the Government Property clause of §§ 13.703 or 13.707 of this title, the following clause will be set forth in the Schedule. The facilities authorized will be listed following the clause, together with the estimated cost of each set forth and the total estimated cost of all such facilities:

FACILITIES ACQUIRED OR FABRICATED

* * * * *

(b) *Facilities provided under fixed-price procurement contracts.* (1) Where existing facilities are to be furnished under the terms of a fixed-price contract, no separate clauses covering such facilities are required other than the Government-furnished property clause as set forth in §§ 13.702 or 13.706 of this title, whichever is applicable. The items of facilities will be listed or specified in the Schedule as Government-furnished property.

(2) Where the acquisition or fabrication of facilities is authorized in a fixed-price contract:

(i) The General Provisions of the contract will be designated "Section I", and in addition to inserting the Government-furnished property clause of §§ 13.702 or 13.706 of this title, the following clause will be set forth in the Schedule. The facilities authorized will be listed following the clause together with the estimated cost of each set forth and the maximum (total) cost of all such facilities:

FACILITIES ACQUIRED OR FABRICATED

• • • • •

(ii) • • •

GENERAL PROVISIONS, SECTION II APPLICABLE ONLY TO FACILITIES ACQUIRED OR FABRICATED

• • • • •

d. • • •

II-2 Overtime and Wage Compensation: Insert the clause set forth in § 1012.102-3(d) of this subchapter.

II-3 Subcontracts: Insert the clause set forth in § 7.702-33 of this title.

• • • • •

(c) [Deleted]

(d) *Patent rights clause.* If the contract does not contain the Patent Rights clause, § 9.107-5 of this title, and the facilities authorized involve research or development in design, manufacture, or modification, (1) if under the circumstances set forth in paragraph (a)(2) of this section the clause will be added and made applicable only to the facilities, or (2) if under the circumstances set forth in paragraph (b)(2) of this section, the clause will be added to General Provisions, section II.

(e) *Facilities involving construction.* If the facilities being authorized involve construction, as defined in § 12.402 of this title, and the labor clauses required for construction contracts are not otherwise included in the contract, the clause set forth in § 7.705-5 of this title will be added: (1) If under the circumstances set forth in paragraph (a)(2) of this section, and made applicable only to the facilities being constructed, or (2) if under the circumstances set forth in paragraph (b)(2) of this section, to General Provisions, section II. Any providing of nonseverable facilities not located on Government controlled land will require compliance with § 13.307 of this title and § 1013.406.

• • • • •

2. Section 1013.403 is set forth to amend the reference, as follows:

§ 1013.403 Single facilities contract.

Determination of impracticability under § 13.303(c) of this title covering the issuance of facilities contract and lease agreements will be made by the contracting officer of the office issuing the contract or lease Prior to making such determinations the contracting officer will obtain the coordination of MCPK for the proposed action. For this purpose separate divicions of a single corporation will be deemed to be separate contractors if such divisions are normally represented by separate business offices for the purpose of contract negotiation and administration.

§ 1013.408 [Amended]

3. In § 1013.408 the reference in the introductory material is amended to read: "§ 13.101-8" and paragraph (c) is deleted.

4. In § 1013.412, paragraph (b)(4) is set forth to amend the references, as follows:

§ 1013.412 Unusable or unneeded facilities.

• • • • •

(b) • • •

(4) Should Government work materialize, rentals may or may not be charged according to the provisions of § 1013.407. If the contractor desires to make commercial use of this property, rentals will be charged according to §§ 13.404 and 7.702-12 of this title and § 1013.601.

• • • • •

Subpart E—Contract Clauses

1. Sections 1013.502 and 1013.503 are set forth to show amended references, as follows:

§ 1013.502 Government-furnished property clause for fixed-price contracts.

Whenever contracts fall within the purview of paragraph B-102.50(c), § 1030.2 of this subchapter, and government-owned parts and materials are furnished, the following will be added to the end of the third sentence of paragraph (c) of the clause in § 13.702 of this title: "except that with respect to Government property shipped the Contractor will not be required to maintain the property records prescribed by the Manual."

(a) With respect to the first sentence of paragraph (a) of the Government property clause in § 13.702 of this title, it will be the responsibility of the procuring contracting officer to specifically list the government-furnished property in a schedule, or identify the specifications or appendices wherein such information is set forth.

§ 1013.503 Government-property clause for cost-reimbursement type contracts.

Whenever contracts fall within the purview of § 1030.2B-102.50(c), of this subchapter, and Government-owned parts and materials are furnished, the following will be added to the end of the second sentence of paragraph (c) of the clause set forth in § 13.703 of this title: except that with respect to Government property shipped the Contractor will not be required to maintain the property records prescribed by the Manual.

2. Those portions of §§ 1013.504 and 1013.553 affected by reference changes are set forth as follows:

§ 1013.504 Special tooling clause for fixed-price contracts.

(a) • • •

(1) through (3) • • •

(b) • • •

SPECIAL TOOLING

(a) Same as ASPR 13-704(a) (32 CFR 13.704(a)).

(b) Same as ASPR 13-704(b) (32 CFR 13.704(b)).

(c) Same as ASPR 13-704(c) (32 CFR 13.704(c)).

(d) Same as ASPR 13-704(d) (32 CFR 13.704(d)).

(e) Same as ASPR 13-704(e) (32 CFR 13.704(e)).

• • • • •

(g) Same as ASPR 13-704(g) (32 CFR 13.704(g)).

(h) Same as ASPR 13-704(h) (32 CFR 13.704(h)).

(i) Same as ASPR 13.704(i) (32 CFR 13.704(i)).

(j) Same as ASPR 13-704(j) (32 CFR 13.704(j)).

(k) [Deleted]

(l) • • •

(c) Contracts which contain the clause provided by § 13.704 of this title may be amended in the above manner to provide that title to the tooling will vest in the Government immediately, when it is deemed necessary for administrative reasons to establish the Government as owner of the tooling, prior to the occurrence of any of the events set forth in § 13.704 of this title.

(d) The use of special tooling for the performance of other follow-on Government contracts or subcontracts under Government contracts will be subject to the following procedures:

(1) When the administrative contracting officer approves the use of the special tooling in connection with other Government contracts or related subcontracts, a reference to such approval will be incorporated in each other contract or subcontract involved. No further action will be necessary so long as the contract under which the special tooling was originally acquired or fabricated remains active.

(2) When it becomes evident that the contract under which the special tooling was originally acquired or fabricated is to be completed or terminated, and the special tooling is needed for the performance of follow-on contracts, at least one of which contains the clause in § 13.704 of this title, that contract, or if there are more than one follow-on contracts with the clause in § 13.704 of this title, the one with the longest life expectancy, will be amended by the incorporation of the following clause, and a reference thereto will be made in the original authorizing contract:

The special tooling acquired or fabricated pursuant to the terms of contract No. (original contract) is hereby and hereafter to be considered as acquired pursuant to the clause of this contract entitled "Special Tooling" and henceforth subject to the terms and conditions thereof.

If such follow-on contract contains the clause in paragraph (b) of this section, the above provisions will be included in such contract. However, the above provision will not be inserted in the follow-on contract containing the clause in § 13.704 of this title, where the tooling was acquired or fabricated (or considered to be acquired) under a contract containing the clause in paragraph (b) of this section.

(3) In long term programs, it may be necessary to repeat the procedure in subparagraphs (1) and (2) of this paragraph, in order to pass the Government's rights to the special tooling down through the succeeding contracts as each preceding authorizing contract expires. By such procedure, and so long as at

least one fixed-price contract (with the clause in § 13.704 of this title or paragraph (b) of this section, as appropriate), is in active status, the Government's rights to the special tooling are considered to remain unprejudiced and without necessity of exercising the right of option in each transaction. Therefore, each preceding "authorizing" contract may be retired as it expires. However, if a point is reached where the special tooling continues to be needed by the contractor, but the remaining contracts are not fixed-price with the clause in § 13.704 of this title, or paragraph (b) of this section (for example, CPFF, etc.), the administrative contracting officer will exercise the Government's right of option and take title (if the clause in § 13.704 of this title was the last in effect with respect to the tooling). Thereafter, the special tooling will be retained as Government-furnished property for use in connection with the remaining requiring contracts.

§ 1013.553 Special nuclear material.

When special nuclear materials or instruments incorporating special nuclear material are furnished to a contractor as Government property, the following clause will be incorporated in the contract, in addition to the clause prescribed by §§ 13.702, 13.703, 13.706, or 13.707 of this title:

* * * * *

Subpart F—Use of Government-Owned Industrial Facilities on Work Other Than for a Military Department

1. Sections 1013.601–1 through 1013.601–3, and 1013.601–50(a)(5) are set forth to amend the reference, as follows:

§ 1013.601–1 General.

See § 7.702–12 of this title.

§ 1013.601–2 Rental rates.

(a) and (b). See § 7.702–12 of this title. For portable tools and automotive equipment, rental charges will normally be computed at 25 percent per year based on acquisition cost.

(c) See § 7.702–12 of this title. Rental payments (checks) received by contracting officers under facilities contracts will be forwarded for deposit to the appropriate accounting and finance office within 24 hours of receipt. At the time of transmittal, or as soon thereafter as possible, the contracting officer will certify the correctness of the amount of payment and forward such certification to the accounting and finance officer.

§ 1013.601–3 Exceptions.

(a) See § 7.702–12 of this title.

(b) In negotiations which include real property to be used for commercial purposes, rental charges will normally be computed at the following annual rental rates, based on acquisition costs:

(1) For land and land preparation, 5 percent per annum.

(2) For buildings, building installations, and land installations, 8 percent per annum.

(c) See § 7.702–12 of this title. Equipment items of unusual size or performance characteristics may be negotiated and the exception conditions identified in submittal of proposed lease according to § 1013.601–50.

(d)–(e) See § 7.702–12 of this title.

§ 1013.601–50 Procedure.

* * * * *

(a) * * *

(5) Financial or other consideration that will be given to the Government for use of the production equipment. If the contractor is to maintain Government-owned equipment in a nonuse status as all or part of the consideration, give the number of units, general description, including acquisition cost, and total weight (in tons). See § 7.702–12 of this title.

* * * * *

2. Section 1013.608–50 is set forth for editorial changes only, regarding paragraph designations, as follows:

§ 1013.608–50 Delegations of authority.

The commanders, AFLC and AFSC, have been delegated the authority to: Control Government-owned industrial property, including the correction and adjustment of deficiencies and irregularities regarding the administration of such property; grant deviations, in individual cases, from established policy with respect to record requirements on such property; appoint property administrators; and authorize multicontract cost and material control systems. This delegation does not include authority to act on policy matters relating to furnishing Government-owned industrial property and the control thereof, except as specifically stated.

(a) The Commander, AFLC, has vested the authority contained in this section in the Director and Deputy Director of Procurement and Production, Hq AFLC. The Director of Procurement and Production, Hq AFLC, has further delegated authority to (1) Control Government-owned industrial property, including the correction and adjustment of deficiencies and irregularities regarding the administration of such property, (2) grant exceptions, in individual instances, according to § 1030.2, paragraph B–301 of this subchapter, with respect to the policy that contractor's records will be designated and used as official contract records, and (3) appoint property administrators, to the following, subject to limitations set forth herein:

(i) Commanders and vice commanders of major air commands (AFSC and OAR with respect to base procurement only) with power of redelegation limited to the level of a staff officer responsible for procurement within command headquarters and within the headquarters of the first echelon of command immediately subordinate to a major command (numbered Air Force Hq Transport Air Forces and Aeronautical Chart and Information Center or comparable level).

(ii) Commanders and deputy commanders of AFLC field procurement activities with power of redelegation limited to that authority cited in subparagraph (2) of this paragraph to the staff officer responsible for procurement matters, provided such officer is not below the level of the director of procurement and production at the air materiel area level, or equivalent organization. Authority contained in subparagraphs (1) and (3) of this paragraph is not subject to further redelegation.

(iii) Commanders and deputy commanders of air procurement regions (AFRE and APRFE) with power of redelegation limited to a staff officer responsible for procurement or contract administration.

(b) The Commander, AFSC, has vested the authority contained in this section in the Deputy Chief of Staff, Associate Deputy Chief of Staff and Assistant Deputy Chief of Staff, Procurement and Production, Hq AFSC, with power of redelegation. The Deputy Chief of Staff, Procurement and Production, Hq AFSC, has delegated authority to (1) control Government-owned industrial property, including the correction and adjustment of deficiencies and irregularities regarding the administration of such property, (2) grant exceptions, in individual instances according to § 1030.2, paragraph B–301 of this subchapter, with respect to the policy that contractor's records be designated and used as official contract records, and (3) appoint property administrators to the following:

(i) Commander, Office of Aerospace Research, with power of redelegation limited to the level of the staff officer responsible for procurement within the headquarters of the first echelon of command immediately subordinate to OAR.

(ii) Commanders and deputy commanders of AFSC divisions.

(iii) Commanders and deputy commanders of contract management regions or the AF contract management division with power of redelegation limited to chiefs, contract management districts, test site offices, and AF plant representatives.

(iv) Commanders and deputy commanders of AFSC centers.

(c) Staff supervision and technical direction over the first two authorities in the introductory paragraph of this section, will be exercised by the following:

(1) The Field Operations Branch (MCPKF), Hq AFLC, which will exercise staff supervision and technical direction over the control of Government-owned industrial property for all elements of the Air Force, except AFSC and OAR. MCPKF's responsibility relative to AFSC and OAR in this area is limited to base procurement only. MCPK is authorized to grant deviations from established policy in regard to record requirements and authorize multicontract cost and material control systems (AFSC and OAR with respect to base procurement only).

(2) The Property and Plant Clearance Division (SCKAP), Hq AFSC, which will

exercise staff supervision and technical direction over the control of Government-owned industrial property within AFSC and OAR other than base procurement. SCKAP is authorized to grant deviations from established policy in regard to records requirements and authorize multicontract cost and material control systems for AFSC and OAR other than base procurement.

(d) The granting of deviations (i.e., waiver of further accounting and auditing requirements) is limited to instances where: (1) The contract(s) involved have been completed and final payment made, (2) reconstruction of the property records in technical compliance with § 30.2, appendix B and § 30.3, appendix C of this title would serve no constructive purpose, and (3) it is determined, after investigation and documentation of the inadequacies, that waiver of further accounting and auditing action would be in the best interest of the Government.

Subpart X—Facility Expansion Procedure

§ 1013.2402 [Deleted]

1. Section 1013.2402 is deleted.

§ 1013.2406 [Amended]

2. In § 1013.2406, the first two references: "§ 13.402" and "§ 13.101–6" are amended to read "§ 13.303" and "§ 13.-101–8" respectively.

§ 1013.2406–1 [Amended]

3. In § 1013.2406–1, the reference "§ 13.406" in Schedule II is amended to read "§ 13.307"; and in paragraph (c) of Schedule III, the reference "§ 1013.102–3 (k)(7)" in columns 2 and 3 is amended to read "§ 1013.102–3(a)(7)."

Subpart GG—Providing Vehicles to AF Contractors

1. In § 1013.3300, the introductory material is revised to read as follows:

§ 1013.3300 Scope of subpart.

This subpart establishes policies, assigns responsibilities, and prescribes procedures within limitations under § 13.301 of this title for the purpose of:

* * * * *

2. Section 1013.3301(a) is set forth to delete the reference, as follows:

§ 1013.3301 Definition.

(a) Industrial vehicular equipment is that plant equipment that has a direct application and is justified as necessary in support of the manufacture or production of the end item, or is used in actual test programs or in research leading to the development of items that will be produced for the Air Force.

* * * * *

3. In § 1013.3303 the reference in paragraph (b) is revised and in § 1013.3306 the last sentence is revised. These sections now read as follows:

§ 1013.3303 Lease and bailment.

(a) For Leasing see § 1013.3003–5(b).
(b) For Bailment see § 1013.608–51(c)(6).

§ 1013.3306 Maintenance.

When industrial vehicular equipment and/or commercial type vehicles are provided to a contractor, the contracting officer will insert in the contract a provision requiring the contractor to maintain and repair such Government-owned equipment, including normal parts replacement. See § 7.702–14 of this title for guidance.

Subpart HH—Excess Plant Equipment

In § 1013.3402 paragraphs (a) and (c) are set forth to correct the references, as follows:

§ 1013.3402 General conditions.

(a) When items of plant equipment of types not controlled under reserve inventory procedures (supporting plant equipment), must be provided to contractors according to § 1013.102–3, excess Government property will be used to satisfy the requirement whenever possible.

* * * * *

(c) Supporting plant equipment will be provided to an AF contractor only when each item is specifically identified and authorized for acquisition under its facilities contract or lease. In the absence of a facilities contract or lease, the equipment may be covered by the supply or service contract according to § 13.303 of this title. The buyer for the supply or service contract will secure the coordination and approval of a contracting officer from industrial facilities activity of the cognizant AFSC division prior to authorizing the acquisition of supporting equipment through a supply or service contract.

* * * * *

PART 1014—INSPECTION AND ACCEPTANCE

Subpart A—Inspection

§ 1014.105 [Amended]

In § 1014.105, the reference "§ 1001.-1302" is amended to read "§ 1001.1305."

PART 1016—PROCUREMENT FORMS

Subpart B—Forms for Negotiated Procurement

§ 1016.200 [Deleted]

Section 1016.200 is deleted.

Subpart H—Miscellaneous Forms

Section 1016.814–1 is revised to read as follows:

§ 1016.814–1 Architect-Engineer Experience Data (DD Form 1071).

See AFR 85–8 (Selecting Architect-Engineers for Professional Services by Negotiated Contracts).

PART 1017—EXTRAORDINARY CONTRACTUAL ACTIONS TO FACILITATE THE NATIONAL DEFENSE

Subpart B—Requests for Contractual Adjustment

§ 1017.202 [Deleted]

Section 1017.202 is deleted.

PART 1030—APPENDIXES TO AIR FORCE PROCUREMENT INSTRUCTION

§ 1030.2 [Amended]

In § 1030.2, Appendix B—Manual for control of Government property in possession of contractors:

1. In B–207, the text is deleted.

2. In B–301(a), the first reference is amended. B–301(a) now reads as follows:

PART III—RECORDS TO BE MAINTAINED

B–301 *General.*

(a) The authority to grant exceptions to the policy that the contractor's records will be designated and used as the official contract records has been delegated as set forth in § 1013.608–50 of this subchapter. Such exceptions, however, may be authorized, in writing, only in unusual circumstances. Class or group exceptions are not authorized. Each exception authorized must relate to a specific contract, a specific invitation for bid, or specific request for proposals, and must be covered by inclusion of the Property Records clause in § 1013.552 of this subchapter, in the contract.

(1) * * *

* * * * *

§ 1030.3 [Amended]

In § 1030.3, Appendix C—Manual for control of Government property in possession of nonprofit research and development contractors:

1. C–200 is revised to read as follows:

PART II—GOVERNMENT ADMINISTRATIVE PROVISIONS

C–200 *Scope of part.*

See § 1013.608 of this subchapter regarding delegations of authority with respect to the control of Government-owned industrial property, etc.

2. C–207.1(a) is set forth to amend the first reference, as follows:

C–207.1 *General policy.*

(a) The authority to grant exceptions to the policy that the contractor's records will be designated and used as the official contract records has been delegated as set forth in § 1013.608–50 of this subchapter. Such exceptions, however, may be authorized, in writing, only in unusual circumstances. Class or group exceptions are not authorized. Each exception authorized must relate to a specific contract, invitation for bid, or request for proposals and must be covered by inclusion in the contract of the Property Records clause in § 1013.552 of this chapter.

* * * * *

3. In C–213.1, paragraph (m), through its subdivision (iv) is deleted.

§ 1030.5 [Amended]

In § 1030.5, Appendix E—Contract Financing:

E–212.50 is set forth to delete the second reference, as follows:

PART II—BASIC POLICIES

E–212.50 *Facility capability report.* The FCR system (see Subpart I, Part 1 of this title) provides the services of personnel qualified and competent to evaluate credit and financial problems prior to or contemporaneously with contract awards.

E–910 is set forth to amend the second reference as follows:

PART IX—ASSIGNMENT OF CLAIMS ARISING UNDER GOVERNMENT CONTRACTS

E–910 *Transfers of business and corporate mergers.* Transfers of an entire business, corporate mergers, and assignments by operation of law, each of which may effect the assignment of claims under a contract, are not prohibited by the Federal statutes and hence do not depend upon the Assignment of Claims Act of 1940 for their validity. (See § 16.505 and Subpart P, Part 1 of this title.) However, in the case of transfers of a business or corporate mergers, notices of assignment of claims under the contract made by the transferee or successor corporation will not be acknowledged until a supplemental agreement has been executed, substituting the transferee or successor corporation as the contractor with the Government. Similarly, before acknowledging assignments made by transferees by operation of law, the contracting officer will require the submission of a certified copy of the document evidencing the transfer by operation of law.

PART 1053—CONTRACTS; GENERAL

Subpart D—Administrative Requirements

In § 1053.404–2(b) the reference is amended. Paragraph (b) now reads as follows:

§ 1053.404–2 Definitions.

* * * * *

(b) *Contract Management District (CMD).* A component of a contract management region (CMR). It is responsible for surveillance of contractors within an assigned geographical area, excluding contractors referred to in AFP1 1053.404–6(c) * and contractors within a DCASR. The functions, under the responsibility of a CMD, include administration of contracts, industrial property, production and industrial resources analysis, product quality and reliability assurance, industrial security, and accounting and disbursing.

[AFP1 § 1053.404–6(c) filed with document]

* * * * *

PART 1054—CONTRACT ADMINISTRATION

Subpart A—Administration of AF Contracts by Contracting Officers

Section 1054.104 (h) and (n) are revised to read as follows:

§ 1054.104 Matters of contract administration to be handled by Administrative Contracting Officers.

* * * * *

(h) Take administrative action relating to variation in quantities as set forth in § 1001.325 of this subchapter.

* * * * *

(n) Report all litigation involving a CPFF contractor to the Office of the Judge Advocate General, Hq USAF, as required by Part 844, Subchapter D of this chapter. Confer with his staff judge advocate as required.

* * * * *

Subpart K—Reporting Contractors Involved in Bankruptcy, Receivership, Assignment for the Benefit of Creditors, Other Types of Insolvency Proceedings and Probate Proceedings

Section 1054.1102(b) is set forth to amend the reference, as follows:

§ 1054.1102 Reporting institution of bankruptcy, receivership, insolvency, and probate proceedings.

* * * * *

(b) If a contracting officer is informed or is aware of the institution of bankruptcy, receivership, assignment for the benefit of creditors or other type of insolvency proceedings or probate proceedings involving an AF contractor, he will immediately send notice by electrically transmitted message of such proceedings directly to the Contract Financing Division, Directorate of Accounting and Finance, Hq USAF, and to Chief, Tax and Litigation Division, Office of The Judge Advocate General, Hq USAF, Washington, D.C. The notice will include the name of the contractor, address, type of proceedings, court in which proceedings are held, and contracts held by the contractor (see Part 844, Subchapter D of this chapter). If information of such proceedings is first received by the accounting and finance office, that office will submit the information directly to the Contract Financing Division, Directorate of Accounting and Finance, and to Chief, Tax and Litigation Division, Office of The Judge Advocate General. A copy of the notice will be forwarded to the contracting officer, accounting and finance office whose funds are cited in the contract, or the accounting and finance office cited to make payment, as appropriate.

Subpart O—Preparation and Issuance of Shipping Instructions

In § 1054.1502, paragraph (b) (2) is revised to read as follows:

§ 1054.1502 Application.

* * * * *

(b) * * *

(2) Shipping instructions for base procurement as defined in § 1001.201–55 of this subchapter.

* * * * *

PART 1059—AIRCRAFT AND GFAE PROCUREMENT

Subpart B—Use of Production Aircraft in Emergency and Control of Test/Acceptance and Demonstration Flights

In § 1059.202, paragraph (d) (2) is revised to read as follows:

§ 1059.202 Control of test/acceptance and demonstration flights.

* * * * *

(d) * * *

(2) Demonstration flights will be performed according to provisions of AFR 60–6 (Participation in Goodwill Flights, Aerial Reviews and Weapons Demonstrations).

By order of the Secretary of the Air Force.

FREDERICK A. RYKER,
Lieutenant Colonel, U.S. Air Force, Chief, Special Activities Group, Office of The Judge Advocate General.

[F.R. Doc. 65–13994; Filed, Dec. 29, 1965; 8:50 a.m.]

Title 21—FOOD AND DRUGS

Chapter I—Food and Drug Administration, Department of Health, Education, and Welfare

SUBCHAPTER B—FOOD AND FOOD PRODUCTS

PART 121—FOOD ADDITIVES

Subpart D—Food Additives Permitted in Food for Human Consumption

MEDROXYPROGESTERONE ACETATE

Correction

In F.R. Doc. 65–13727, appearing at page 16063 of the issue for Friday, December 24, 1965, the equation appearing at the end of § 121.1187 should read as follows:

$$1 \text{ part per million of medroxyprogesterone acetate} = \frac{A \text{ sample solution}}{A \text{ standard solution}} \times \frac{100}{\text{weight sample}}$$

Title 33—NAVIGATION AND NAVIGABLE WATERS

Chapter II—Corps of Engineers, Department of the Army

PART 204—DANGER ZONE REGULATIONS

Gulf of Mexico, Fla.

Pursuant to the provisions of section 7 of the River and Harbor Act of August 8, 1917 (40 Stat. 266; 33 U.S.C. —), § 204.120 governing the use and navigation of danger zones in the Gulf of Mexico, Fla., is hereby amended redesignating the boundaries of Area No. 1 and

prescribing new firing periods, revising paragraphs (a)(1) and (b)(1), effective 30 days after publication in the FEDERAL REGISTER as follows:

§ 204.120 Gulf of Mexico, southeast of St. Andrew Bay East Entrance, Small Arms Firing Range, Tyndall Air Force Base, Fla.

(a) *The danger zones.*—(1) *Area No. 1.* The waters of the Gulf of Mexico, southeast of St. Andrew Bay East Entrance within a rectangular area beginning at a point on shore at latitude 30°04'32", longitude 85°37'07"; thence to latitude 30°03'47", longitude 85°37'58"; thence to latitude 30°03'19", longitude 85°37'00"; thence to a point on shore at latitude 30°04'13", longitude 85°36'47"; thence along the shoreline to the point of beginning.

* * * * *

(b) *The regulations.* (1) No vessel or other craft shall enter or remain in the areas during periods of firing. Area No. 1 will be used for firing practice between 6:30 a.m. and 5:00 p.m., as scheduled, Monday through Friday, with possibly some sporadic firings on Saturdays and Sundays. A 10' x 18' red flag will be displayed on a pole at the shoreline whenever firing is in progress.

* * * * *

(Regs., Dec. 10, 1965, 1507-32; Gulf of Mexico, Fla.-ENGCW-ON; sec. 7, 40 Stat. 266; 33 U.S.C. 1)

J. C. LAMBERT,
Major General, U.S. Army,
The Adjutant General.

[F.R. Doc. 65-13896; Filed, Dec. 29, 1965; 8:45 a.m.]

Title 45—PUBLIC WELFARE

Chapter VIII—United States Civil Service Commission

PART 801—VOTING RIGHTS PROGRAM

Appendix A

ALABAMA

Appendix A to Part 801 is amended under the heading "Dates, Times, and Places for Filing", by the addition of a second place for filing in Lowndes County, Ala., as set out below:

ALABAMA

County; Place for Filing; Beginning Date.
* * * * *
Lowndes; (1) Fort Deposit—Post Office Building; August 10, 1965; (2) Hayneville—trailer at U.S. Post Office; January 3, 1966.

(Secs. 7 and 9 of the Voting Rights Act of 1965; P.L. 89-110)

UNITED STATES CIVIL SERVICE COMMISSION,
MARY V. WENZEL,
Executive Assistant to the Commissioners.

[F.R. Doc. 65-14009; Filed, Dec. 29, 1965; 10:43 a.m.]

Title 47—TELECOMMUNICATION

Chapter I—Federal Communications Commission

[FCC 65-1136]

PART 87—AVIATION SERVICES

Exempt Radionavigation Land Test Stations From Log Requirements

At a session of the Federal Communications Commission held at its offices in Washington, D.C., on the 22d day of December 1965;

The Commission having under consideration amendment of § 87.99 to exempt licensees of radionavigation land test stations (MTF) from log keeping for this class of station; and,

It appearing, that radionavigation land test stations operate on very low power, are not used for communications and are used solely for testing of radionavigation equipment; and,

It further appearing, that from information obtained at a recent meeting of the Aerospace Flight Test Radio Coordinating Council held in Atlanta, Ga., the keeping of a log for such a station will not provide the Commission with any information that will materially assist it in administering the service; and,

It further appearing, that an exemption from this requirement will relieve licensees of an unnecessary administrative burden; and,

It further appearing, that in view of the foregoing, the public interest, convenience, and necessity would be served by amending Part 87—Aviation Services, to exempt radionavigation land test stations from the log requirements of § 87.99; and,

It further appearing, that the amendment adopted herein removes an unnecessary administrative burden from licensees of radionavigation land test stations and the public interest would be served by the expeditious removal of this requirement hence the prior notice, procedure, and effective date provisions of section 4 of the Administrative Procedure Act are impracticable; and,

It further appearing, that authority for the rules herein adopted is contained in sections 4(i), 303 (j) and (r) of the Communications Act of 1934, as amended.

It is ordered, That Part 87 of the Commission's rules is amended as set forth in the Appendix below, effective January 4, 1966.

(Sec. 4, 48 Stat. 1066, as amended; 47 U.S.C. 154. Interprets or applies sec. 303, 48 Stat. 1082, as amended; 47 U.S.C. 303)

NOTE: Rules changes herein will be covered by T.S. V(64)-9.

Released: December 27, 1965.

FEDERAL COMMUNICATIONS COMMISSION,[1]
[SEAL] BEN F. WAPLE,
Secretary.

[1] Commissioner Wadsworth absent.

1. Section 87.99(a) is amended to read as follows:

§ 87.99 Information required in station logs.

(a) Except for radionavigation land test station (MTF), all stations at fixed locations shall maintain logs showing hours of operation, frequencies used, station with which communication was held, and hours of duty and signature of the operator(s) on duty.

* * * * *

[F.R. Doc. 65-13942; Filed, Dec. 29, 1965; 8:49 a.m.]

Title 50—WILDLIFE AND FISHERIES

Chapter I—Bureau of Sport Fisheries and Wildlife, Fish and Wildlife Service, Department of the Interior

PART 32—HUNTING

Tennessee National Wildlife Refuge, Tenn.

The following special regulation is issued and is effective on date of publication in the FEDERAL REGISTER.

§ 32.22 Special regulations; upland game; for individual wildlife refuge areas.

TENNESSEE

TENNESSEE NATIONAL WILDLIFE REFUGE

Public hunting of rabbits and quail on the Tennessee National Wildlife Refuge, Tenn., is permitted only on the areas designated by signs as open to hunting. These open areas, comprising 1,500 acres, are delineated on a map available at the refuge headquarters and from the Regional Director, Bureau of Sport Fisheries and Wildlife, 809 Peachtree-Seventh Building, Atlanta, Ga., 30323. Hunting shall be in accordance with all applicable State regulations governing the hunting of rabbits and quail subject to the following special conditions:

(1) The open season on the refuge extends from January 27 through February 5, 1966.

(2) The use of dogs is not permitted.

(3) Camping on the area is not permitted.

(4) Bobcats, gray foxs, woodchucks, and crows may be taken.

(5) Hunters may enter public hunting area 1 hour before sunrise and must be out by 1 hour after sunset.

(6) Hunters shall wear red, orange, or yellow as part of their field dress.

(7) A Federal permit is not required to enter the public hunting area.

The provisions of this special regulation supplement the regulations which govern hunting on wildlife refuge areas generally which are set forth in Title 50, Code of Federal Regulations, Part 32, and are effective through February 5, 1966.

WALTER A. GRESH,
Regional Director, Bureau of Sport Fisheries and Wildlife.

[F.R. Doc. 65-13915; Filed, Dec. 29, 1965; 8:46 a.m.]

Proposed Rule Making

DEPARTMENT OF AGRICULTURE

Consumer and Marketing Service

[7 CFR Part 1006]

[Docket No. AO-356]

MILK IN NORTHEAST-CENTRAL FLORIDA MARKETING AREA

Supplemental Notice of Hearing on Proposed Marketing Agreement and Order

Pursuant to the provisions of the Agricultural Marketing Agreement Act of 1937, as amended (7 U.S.C. 601 et seq.), and the applicable rules of practice and procedure governing the formulation of marketing agreements and marketing orders (7 CFR Part 900), notice was issued December 22, 1965, giving notice of a public hearing to be held at the Thunderbird Motor Hotel, 5865 Expressway, Jacksonville, Fla., beginning at 10 a.m., e.s.t., on January 19, 1966, and at the Robert Meyer Motor Inn, 151 East Washington Street, Orlando, Fla., beginning at 10 a.m., e.s.t., on January 24, 1966, with respect to a proposed marketing agreement and order, regulating the handling of milk in the Northeast-Central Florida marketing area.

Supplemental notice is hereby given with respect to proposals to be considered at such hearing.

The proposals, set forth below, have not received the approval of the Secretary of Agriculture.

Proposed by Sunshine State Dairymen's Cooperative and Chipola Dairy Cooperative:

Proposal No. 7. The proposed order submitted for hearing by the Dairy Farmers Mutual and Northeast Florida Milk Producers Association be amended to provide that the area to be covered by said marketing order be amended so that said area is described as follows:

North and Central Florida Milk Marketing Area comprised of the following counties, all in the State of Florida: Alachua, Baker, Bay, Bradford, Brevard, Calhoun, Citrus, Clay, Columbia, Duval, Flagler, Gadsden, Gilchrist, Gulf, Hamilton, Holmes, Indian River, Jackson, Jefferson, Lafayette, Lake, Leon, Levy, Liberty, Madison, Marion, Nassau, Orange, Osceola, Putnam, St. John, Seminole, Sumter, Suwannee, Taylor, Union, Volusia, Wakulla and Washington.

Proposed by The Southland Corporation:

Proposal No. 8. We wish to propose the same counties for the tentative Northeast-Central Florida Marketing Area proposed by the proponent cooperative associations, all in the State of Florida: Alachua, Baker, Bradford, Brevard, Citrus, Clay, Columbia, Duval, Flagler, Gilchrist, Hamilton, Indian River, Lake, Levy, Marion, Nassau, Orange, Osceola, Putnam, St. John, Seminole, Sumter, Suwannee, Union, and Volusia. In addition, we wish to propose the following counties, all in the State of Florida: Bay, Calhoun, Dixie, Franklin, Gadsden, Gulf, Jackson, Jefferson, Lafayette, Leon, Liberty, Madison, Taylor, Wakulla and Washington.

Proposed by Foremost Dairies of the South, division of Home Town Foods, Inc.:

Proposal No. 9.

§ 1006.6 Northeast-Central Florida Marketing Area.

"The Northeast-Central Florida Marketing Area" hereinafter called the "Marketing Area" means all the territory geographically included within the boundaries of the following counties, all in the State of Florida, including all waterfront facilities connected therewith and all territory wholly or partly therein occupied by Government (Municipal, State, or Federal) reservations, installations, institutions, or other similar establishments.

Alachua.	Lafayette.
Baker.	Lake.
Bay.	Leon.
Bradford.	Levy.
Brevard.	Liberty.
Calhoun.	Madison.
Citrus.	Marion.
Clay.	Nassau.
Columbia.	Orange.
Dixie.	Osceola.
Duval.	Putnam.
Flagler.	St. Johns.
Franklin.	Seminole.
Gadsden.	Sumter.
Gilchrist.	Suwanee.
Gulf.	Union.
Hamilton.	Taylor.
Holmes.	Volusia.
Indian River.	Wakulla.
Jefferson.	Washington.

Copies of this notice may be procured from the Hearing Clerk, Room 112-A, Administration Building, U.S. Department of Agriculture, Washington, D.C., 20250, or may be there inspected.

Signed at Washington, D.C., on December 27, 1965.

ROY W. LENNARTSON,
Acting Administrator.

[F.R. Doc. 65-13927; Filed, Dec. 29, 1965; 8:47 a.m.]

[7 CFR Part 1102]

[Docket No. AO-237-A12]

MILK IN FORT SMITH, ARK., MARKETING AREA

Decision on Proposed Amendments to Tentative Marketing Agreement and to Order

Pursuant to the provisions of the Agricultural Marketing Agreement Act of 1937, as amended (7 U.S.C. 601 et seq.), and the applicable rules of practice and procedure, governing the formulation of marketing agreements and marketing orders (7 CFR Part 900), a public hearing was held at Fort Smith, Ark., on December 21, 1965, pursuant to notice thereof issued on December 14, 1965 (30 F.R. 15591).

The material issues on the record of the hearing related to:

1. Class I price.

2. Whether an emergency exists which warrants the omission of a recommended decision and the opportunity for interested persons to file exceptions thereto and the immediate issuance of a final decision.

Findings and conclusions. The following findings and conclusions on the material issues are based on evidence presented at the hearing and the record thereof:

1. *Class I price in the Fort Smith, Ark., marketing area.* The supply-demand adjustment in the Fort Smith, Ark., order should be plus 25 cents from the effective date of amendment and for each month through June 30, 1966.

The amount of the supply-demand adjustment should be plus 25 cents through June 1966 to provide a continuation of the usual relationship of Fort Smith order Class I prices with the Central Arkansas order Class I prices. A similar modification of the Central Arkansas order supply-demand adjustment was made effective December 17, 1965. During 1965 the amount of the adjustment has varied from plus 18 cents to plus 36 cents, the latter being the adjustment in December.

This modification of Class I pricing was requested on the record by the Central Arkansas Milk Producers Association whose membership on this market comprises the total supply for the market. The total number of producers on the market varies from about 125 to 150, and many of them from time to time also supply milk to the Central Arkansas market. There was no opposing testimony to the requested price change.

While producers in this market requested the same modification be applied to the Fort Smith supply-demand adjustment as under the Central Arkansas order and during the same period, they did not request that the prices be identical each month in the two orders. Because of the difference in the Class I price differentials, the Fort Smith Class I price, modified as proposed, would be 6 cents per hundredweight lower than the Central Arkansas prices in the months of January and February 1966, 35 cents higher in the month of March and 5 cents lower in the months of April, May and June. This, however, is the usual relationship of the Class I prices of these two markets, since price formula factors other than the Class I differentials,

namely the supply-demand adjustment and basic formula price, are the same in the two orders. Producers' representative held that such pattern of relationship to the Central Arkansas prices in these months was proper.

The Fort Smith marketing area is served by two handlers fully regulated under this order. There is route distribution in the marketing area also by handlers regulated by the Central Arkansas, Ozarks, and Oklahoma Metropolitan orders. Fort Smith handlers have route disposition in the Ozarks and Central Arkansas marketing areas. The proposed amendment would tend to stabilize intermarket price relationships with such other markets during the designated period.

In view of the close relationship of the Fort Smith market to the Central Arkansas market where a similar amendment was recently effected, it is necessary that this amendment to this order be made effective as soon as possible to forestall development of disorderly marketing conditions.

The order modification herein proposed should be made effective at the earliest possible date. If the effective date is not the first day of a month, thus resulting in different Class I prices for the two portions of the month, handlers may elect a separate accounting period for each such portion of the month, or may elect to pay for Class I milk received during the entire month at an average price calculated by prorating the two Class I prices according to the number of days of the month each price applies. There would probably be little difference in returns to producers under either option. A handler should indicate the option he selects at the time he files his report for the month.

2. *Emergency action.* The due and timely execution of the function of the Secretary under the Act imperatively and unavoidably requires the omission of a recommended decision and opportunity for exceptions thereto, on the above issue.

The conditions in this market are such that it is urgent that remedial action be taken as soon as possible. Any delay in informing interested parties of the conclusions reached will tend to make ineffective the relief sought. The time necessarily involved in the preparation, filing and publication of a recommended decision and filing of exceptions thereto would in this instance contribute to the threat of disorderly marketing conditions.

The notice of hearing stated that consideration would be given to the economic and emergency marketing conditions relating to the proposed amendments. Action under the procedure described above was requested by proponent and a handler at the hearing.

It is therefore found that good cause exists for omission of the recommended decision and the opportunity for filing exceptions thereto.

No briefs were filed by interested parties.

General findings. The findings and determinations hereinafter set forth are supplementary and in addition to the findings and determinations previously made in connection with the issuance of the aforesaid order and of the previously issued amendments thereto; and all of said previous findings and determinations are hereby ratified and affirmed, except insofar as such findings and determinations may be in conflict with the findings and determinations set forth herein.

(a) The tentative marketing agreement and the order as hereby proposed to be amended, and all of the terms and conditions thereof will tend to effectuate the declared policy of the Act;

(b) The parity prices of milk, as determined pursuant to section 2 of the Act, are not reasonable in view of the price of feeds, available supplies of feeds, and other economic conditions which affect market supply and demand for milk in the marketing area, and the minimum prices specified in the proposed marketing agreement and the order, as hereby proposed to be amended, are such prices as will reflect the aforesaid factors, insure a sufficient quantity of pure and wholesome milk, and be in the public interest; and

(c) The tentative marketing agreement and the order, as hereby proposed to be amended, will regulate the handling of milk in the same manner as, and will be applicable only to persons in the respective classes of industrial and commercial activity specified in, a marketing agreement upon which a hearing has been held.

Marketing agreement and order. Annexed hereto and made a part hereof are two documents entitled, respectively, "Marketing Agreement Regulating the Handling of Milk in the Fort Smith, Ark., Marketing Area," and "Order Amending the Order, Regulating the Handling of Milk in the Fort Smith, Ark., Marketing Area," which have been decided upon as the detailed and appropriate means of effectuating the foregoing conclusions.

It is hereby ordered, That all of this decision, except the attached marketing agreement, be published in the FEDERAL REGISTER. The regulatory provisions of said marketing agreement are identical with those contained in the order, as hereby proposed to be amended by the attached order which will be published with this decision.

Determination of representative period. The month of October 1965 is hereby determined to be the representative period for the purpose of ascertaining whether the issuance of the attached order, as amended and as hereby proposed to be amended, regulating the handling of milk in the Fort Smith, Ark., marketing area is approved or favored by producers, as defined under the terms of the order, as amended and as hereby proposed to be amended, and who, during such representative period were engaged in the production of milk for sale within the aforesaid marketing area.

Signed at Washington, D.C., on December 23, 1965.

GEORGE L. MEHREN,
Assistant Secretary.

Order[1] Amending the Order Regulating the Handling of Milk in the Fort Smith, Ark., Marketing Area

§ 1102.0 Findings and determinations.

The findings and determinations hereinafter set forth are supplementary and in addition to the findings and determinations previously made in connection with the issuance of the aforesaid order and of the previously issued amendments thereto; and all of said previous findings and determinations are hereby ratified and affirmed, except insofar as such findings and determinations may be in conflict with the findings and determinations set forth herein.

(a) *Findings upon the basis of the hearing record.* Pursuant to the provisions of the Agricultural Marketing Agreement Act of 1937, as amended (7 U.S.C. 601 et seq.), and the applicable rules of practice and procedure governing the formulation of marketing agreements and marketing orders (7 CFR Part 900), a public hearing was held upon certain proposed amendments to the tentative marketing agreement and to the order regulating the handling of milk in the Fort Smith, Ark., marketing area. Upon the basis of the evidence introduced at such hearing and the record thereof, it is found that:

(1) The said order as hereby amended, and all of the terms and conditions thereof, will tend to effectuate the declared policy of the Act;

(2) The parity prices of milk, as determined pursuant to section 2 of the Act, are not reasonable in view of the price of feeds, available supplies of feeds, and other economic conditions which affect market supply and demand for milk in the said marketing area, and the minimum prices specified in the order as hereby amended are such prices as will reflect the aforesaid factors, insure a sufficient quantity of pure and wholesome milk, and be in the public interest; and

(3) The said order as hereby amended, regulates the handling of milk in the same manner as, and is applicable only to persons in the respective classes of industrial or commercial activity specified in, a marketing agreement upon which a hearing has been held.

Order relative to handling. It is therefore ordered, that on and after the effective date hereof the handling of milk in the Fort Smith, Ark., marketing area shall be in conformity to and in compliance with the terms and conditions of the aforesaid order, as amended and as hereby further amended, as follows:

In § 1102.51(a) the introductory text of subparagraph (3) is revised to read as follows:

§ 1102.51 Class prices.

* * * * * * *

(a) *Class I milk.* * * *

(3) For a "minus deviation percentage" the Class I price shall be increased

[1] This order shall not become effective unless and until the requirements of § 900.14 of the rules of practice and procedure governing proceedings to formulate marketing agreements and marketing orders have been met.

and for a "plus deviation percentage" the Class I price shall be decreased as follows: *Provided*, That the adjustment shall be plus 25 cents for each month from the effective date of this order through June 30, 1966:

* * * * *

[F.R. Doc. 65-13928; Filed, Dec. 29, 1965; 8:48 a.m.]

POST OFFICE DEPARTMENT

[39 CFR Parts 112, 114, 168]

INTERNATIONAL MAIL

Proposed Discontinuance of Eight-Ounce Merchandise Packages to Certain Countries

Correction

In F.R. Doc. 65-13637 appearing at page 15810 in the issue for Wednesday, December 22, 1965, the third to last line of the final paragraph now reads: "* * * any time prior to the 13th day following * * *." It is corrected to read: "* * * any time prior to the 30th day following * * *."

FEDERAL COMMUNICATIONS COMMISSION

[47 CFR Part 73]

[Docket No. 14229]

UHF TELEVISION CHANNELS

Fostering Expanded Use; Order Further Extending Time for Filing Comments

1. The National Association of Educational Broadcasters (NAEB) has filed a petition requesting that the time for filing comments on the further notice of proposed rule making in the above-captioned proceeding be extended from December 15, 1965, to January 17, 1966, and for reply comments from January 5, 1966, to February 7, 1966.

2. NAEB desires additional time so that it can examine the new revised UHF assignment plan before submitting its comments with respect to the proposed new low-power community television service on Channels 70 to 83.

3. The Commission wishes to have all pertinent comments with respect to this proposal before reaching a final decision. The desire of NAEB to relate the UHF assignment table to the various aspects of the proposed new service appears reasonable. The revised UHF plan has not yet been issued.

4. *Accordingly, it is ordered*, This 22d day of December 1965, that the request of the National Association of Educational Broadcasters is granted and the time for filing comments is extended from December 15, 1965, to January 17, 1966, and the time for filing replies thereto is extended from January 5, 1966, to February 7, 1966.

5. This action is taken pursuant to the authority contained in section 4(i), 5(d)(1), and 303(r) of the Communications Act of 1934, as amended, and § 0.281(d)(8) of the Commission rules.

Released: December 27, 1965.

FEDERAL COMMUNICATIONS COMMISSION,
[SEAL] BEN F. WAPLE,
Secretary.

[F.R. Doc. 65-13943; Filed, Dec. 29, 1965; 8:49 a.m.]

[47 CFR Part 91]

[Docket No. 16386, FCC 65-1139]

FOREST PRODUCTS RADIO SERVICE

Notice of Proposed Rule Making

1. Notice is hereby given of proposed rule making in the above-entitled matter.

2. The Commission has under consideration a petition for rule making (RM-689) filed on November 27, 1964, by Forest Industries Radio Communications (FIRC). FIRC has requested certain amendments to the eligibility provisions of the Forest Products Radio Service, § 91.351. The amendments FIRC as requested are basically two in number. The first of these relates to the dual eligibility of certain persons in both the Forest Products and Manufacturers Radio Services; and the second concerns eligibility of persons who perform specialized transportation functions, such as log hauling, for licensees in the Forest Products Radio Service.

3. Many persons are engaged in activities that constitute dual eligibility, that is, eligibility in both the Forest Products and Manufacturers Radio Services. Indeed, many persons are licensed in both Services and use one set of radio facilities for their logging and other woods operations and another set of facilities for their woods products manufacturing activities. Because of the integrated operational characteristics of these raw products gathering and subsequent manufacturing activities, FIRC has requested that, any person engaged in the manufacture of lumber, plywood, etc., products, and who is also engaged in tree logging, tree farming, or related woods operations, and therefore eligible in the Forest Products Radio Service, be allowed to be authorized to operate all of his radio facilities in the Forest Products Radio Service—on frequencies available to that Service. This amendment, according to FIRC, would enable persons to employ one set of radio facilities for all of their eligible activities and conduce to more efficient and safer day-to-day operations.

4. The second amendment requested by FIRC would accommodate those persons who perform specialized transporting functions for the forest products industry. Under our present rules, persons whose primary business activity is transportation—including the transporting or hauling of logs—must look to the Motor Carrier Radio Service for eligibility and frequency selection. However, as many persons are engaged in transporting activities, on a contract basis solely for the forest products industry; and as this hauling or transporting function is integral, if not essential, to the whole woods-to-mills process, FIRC believes that an eligibility category for log, pulp, etc. haulers should be established in the Forest Products Radio Service.

5. A second category of haulers are those whose activities in association with persons in the forest products industry are on a part-time or as-available basis. These transporters, in short, do not engage in transportation activities that are confined solely or exclusively to the forest products industry. When, however, these persons' vehicles are used in connection with forest products industry activities it is essential, according to FIRC, that these vehicles be able to communicate with the Forest Products Radio Service licensee or licensees to whom their services have been contracted. To establish this necessary communications link, the FIRC requests an amendment to the Forest Products Radio Service rules which would enable a licensee to install radios in the vehicles of the person or persons employed by him.

6. The Commission is persuaded, on the basis of the information brought to its attention by FIRC, that amendments to the rules, along the lines suggested by FIRC, should be considered. In this proceeding, amendments to § 91.351 are proposed which encompass solutions to the problems discussed above in paragraph 3 relating to dual eligibility, and in paragraph 4 concerning prime eligibility for persons who are engaged in hauling activities solely for the forest products industry. With respect to those persons who perform certain specialized hauling functions on a part-time or nonexclusive basis; however, the Commission is not disposed to consider this problem in the narrow context of a simple amendment to the Forest Products Radio Service Rules. On the basis of the Commission's experience in administering other of the Land Mobile Radio Services, we have found that the problem posed by FIRC with reference to persons working under contract to a licensee—and in need of integrated mobile communications facilities—is not unique to the Forest Products Radio Service. In a collateral rule making proceeding in Docket No. 16387, adopted simultaneously with the instant one, we are proposing rules amendments which are applicable to all of the Industrial Radio Services, including the Forest Products Radio Service, which provide, in substance, that a licensee of a base station may install mobile units licensed to him in the vehicles of other persons furnishing to the licensee, under contract, a facility or service within the purview of the eligible activities that govern entry into the particular service. FIRC's attention is specifically directed to the referenced proceeding.

7. The proposed amendments of the rules are contained in the appendix; and

are issued pursuant to authority contained in sections 4(i) and 303 of the Communications Act of 1934, as amended.

8. Pursuant to applicable procedures set forth in § 1.415 of the Commission's rules, interested persons may file comments on or before February 7, 1966, and reply comments on or before March 1, 1966. All relevant and timely comments and reply comments will be considered by the Commission before final action is taken in this proceeding. In reaching its decision in this proceeding the Commission may also take into account other relevant information before it, in addition to the specific comments invited by this notice.

9. In accordance with the provisions of § 1.419 of the Commission's rules, an original and 14 copies of all statements, briefs or comments filed shall be furnished the Commission.

Adopted: December 22, 1965.

Released: December 27, 1965.

FEDERAL COMMUNICATIONS COMMISSION,[1]
[SEAL] BEN F. WAPLE,
Secretary.

Section 91.351 is amended as follows:

§ 91.351 Eligibility.

The following persons are eligible to hold authorizations to operate radio stations in the Forest Products Radio Service:

(a) A person who is engaged in tree logging, tree farming, or related woods operations including related hauling activities, if the hauling activities are performed under contract to, and exclusively for, persons engaged in woods operations.

(b) A person directly engaged in manufacturing lumber, plywood, hardboard, or pulp and paper products from wood fiber, if such person is otherwise eligible in this Service under the provisions of paragraph (a) of this section.

(c) A subsidiary corporation proposing to furnish a nonprofit radiocommunication service to its parent corporation or to another subsidiary of the same parent where the party to be served is engaged in any of the activities set forth in paragraph (a) or (b) of this section.

(d) A nonprofit corporation or association, organized for the purpose of furnishing a radiocommunication service solely to persons who are actually engaged in one or more of the activities set forth in paragraph (a) or (b) of this section. Such a corporation or association shall render service only on a nonprofit cost-sharing basis, said costs to be prorated on an equitable basis among all persons to whom service is rendered. Records which reflect this cost-sharing nonprofit basis shall be maintained and held available for inspection by Commission representatives. Each person licensed under the provisions of this paragraph shall obtain prior approval from the Commission for each person who proposes to participate in the licensee's service.

[F.R. Doc. 65-13944; Filed, Dec. 29, 1965; 8:49 a.m.]

[1] Commissioner Wadsworth absent.

[47 CFR Part 91]

[Docket No. 16387; FCC 65-1140]

PERSONS PROVIDING CERTAIN CONTRACTUAL SERVICES TO LICENSEE

Permitted To Install Mobile Units in Vehicles

1. Notice of proposed rule making in the above-entitled matter is hereby given.

2. Many licensees in the Industrial Radio Services conduct their day-to-day business activities in conjunction with subcontractors and/or persons who provide specialized services or facilities to the licensees under contract. Very often, these subcontractors and other persons do not have radio equipped vehicles, or, if their vehicles are so equipped, they may be licensed in a radio service other than the one in which the person for whom they are to work is licensed. In many cases, the need for communications, particularly with reference to dispatching and routing, between the parties, is critical to safety and timely and efficient operational or business practices.

3. The purpose of this proceeding is to amend our Industrial Radio Services Rules to the extent that, a base station licensee who employs subcontractors and other persons rendering specialized services or facilities, may be allowed to install mobile transmitters licensed to him in the vehicles of the subcontractors and/or others employed by him. The use to be made of the licensed transmitters installed in another person's vehicles would have to be strictly confined to the licensee's activities that constituted eligibility for him in the Radio Service in which he operates.

4. A licensee would be required to maintain exclusive control over the operation of the stations. A written agreement between the licensee and the persons in whose vehicles transmitters are to be installed shall verify the fact that the licensee has the sole right of control of the mobile units, that the vehicle operators shall operate the radio units subject to the orders and instructions of the base station operator and that the licensee shall at all times have such access to and control of the mobile equipment as will enable him to carry out his responsibilities under his license.

5. This proposal is responsive to certain relief requested in a petition for rule making filed by Forest Industries Radio Communications (IRC) on November 27, 1964 (RM-689).[1]

6. Authority for the adoption of the amendments proposed herein is contained in sections 4(i) and 303 of the Communications Act of 1934, as amended.

7. Pursuant to applicable procedures set out in § 1.415 of the Commission's rules, interested persons may file comments on or before February 7, 1966, and reply comments on or before March 1, 1966. All relevant and timely comments and reply comments will be considered by the Commission before final action is taken in this proceeding. In reaching its decision in this proceeding, the Commission may also take into account other relevant information before it, in addition to the specific comments invited by this notice.

8. In accordance with the provisions of § 1.419(b) of the rules, an original and 14 copies of all comments, replies, pleadings, briefs, and other documents shall be furnished the Commission.

Adopted: December 22, 1965.

Released: December 27, 1965.

FEDERAL COMMUNICATIONS COMMISSION,[2]
[SEAL] BEN F. WAPLE,
Secretary.

Section 91.6 is amended by adding a new paragraph (d) as follows:

§ 91.6 Cooperative arrangements.

* * * * *

(d) A licensee may install mobile units licensed to him in the vehicles of persons furnishing to the licensee, under contract, a facility or service directly related to the activities that constituted eligibility for the station licensee in the service in which he is authorized. The licensee shall maintain exclusive control over the operation of the units. In order to maintain such control, each person in whose vehicles the mobile units of the licensee are proposed to be installed shall enter into a written agreement verifying that the licensee has the sole right of control of the mobile radio units, that the vehicle operators shall operate the radio units subject to the orders and instructions of the base station operator and that the licensee shall at all times have such access to and control of the mobile equipment as will enable him to carry out his responsibilities under his license. A copy of the agreement with vehicle owners required hereby shall be kept with the station records.

[F.R. Doc. 65-13945; Filed, Dec. 29, 1965; 8:49 a.m.]

[1] Other relief requested by FIRC in its Nov. 27, 1964, petition is considered in Docket No. 16386, dated December 22, 1965.

[2] Commissioner Wadsworth absent.

Notices

DEPARTMENT OF THE TREASURY

Bureau of Customs

[Antidumping—AA 643.3-m]

WALL TILE FROM JAPAN

Antidumping Proceeding Notice

DECEMBER 27, 1965.

On December 9, 1965, the Commissioner of Customs received information in proper form pursuant to the provisions of § 14.6(b) of the Customs Regulations indicating a possibility that ceramic glazed wall tile imported from Japan is being, or likely to be, sold at less than fair value within the meaning of the Antidumping Act, 1921, as amended.

Ordinarily, merchandise is considered to be sold at less than fair value when the net, f.o.b. factory price for exportation to the United States is less than the net, f.o.b. factory price to purchasers in the home market, or, where appropriate, to purchasers in other countries, after due allowance is made, for differences in quantity and circumstances of sale.

A summary of the information received is as follows: Extensive information and documentation indicates that the price for exportation to the United States is less than the price of comparable tile to purchasers in the home market, after appropriate adjustment for estimated differences in the merchandise, and circumstances of sale.

In order to establish the validity of the information, the Bureau of Customs is instituting an inquiry pursuant to the provisions of § 14.6(d) (1)(ii), (2), and (3) of the Customs Regulations.

The information was submitted by Howrey, Simon, Baker & Murchison, Washington, D.C., on behalf of the Ceramic Tile Manufacturers of the United States.

This notice is published pursuant to § 14.6(d)(1)(i) of the Customs Regulations (CFR 14.6(d)(1)(i)).

[SEAL] LESTER D. JOHNSON,
Commissioner of Customs.

[F.R. Doc. 65-13993; Filed, Dec. 29, 1965; 8:50 a.m.]

Office of the Secretary

[Dept. Circ. 570, 1964 Rev. Supp. No. 11]

HOME FIRE AND MARINE INSURANCE COMPANY OF CALIFORNIA

Surety Company Acceptable on Federal Bonds

DECEMBER 23, 1965.

A Certificate of Authority as an acceptable surety on Federal bonds has been issued by the Secretary of the Treasury to the following company under the Act of Congress approved July 30, 1947, 6 U.S.C. 6–13.

An underwriting limitation of $783,000 has been established for the company. Further details as to the extent and localities with respect to which the company is acceptable as surety on Federal bonds will appear in the next revision of Department Circular 570, to be issued as of June 1, 1966. Copies of the Circular, when issued, may be obtained from the Treasury Department, Bureau of Accounts, Surety Bonds Branch, Washington, D.C., 20226.

State in which incorporated, name of company and location of principal executive office

California
Home Fire and Marine Insurance Company of California
San Francisco, Calif.

[SEAL] JOHN K. CARLOCK,
Fiscal Assistant Secretary.

[F.R. Doc. 65-13929; Filed, Dec. 29, 1965; 8:48 a.m.]

POST OFFICE DEPARTMENT

ORGANIZATION AND ADMINISTRATION

Board of Contract Appeals

The statement of the Department's Organization and Administration as published in the FEDERAL REGISTER of May 25, 1965, at pages 6988–7017, and as amended by 30 F.R. 7969, is further amended by revising § 821.52a to clarify the jurisdiction of Board of Contract Appeals. As so amended, § 821.52a reads as follows:

821.5 Judicial Officer.

* * * * *

.52 Board of Contract Appeals. a. The Board of Contract Appeals is the authorized representative of the Postmaster General to hear and decide appeals from decisions of Contracting Officers when and to the extent such appeals are expressly authorized by the terms of any contract to which the United States is a party. The chairman of the Board of Contract Appeals is authorized to promulgate rules of procedure for the Board of Contract Appeals. These duties shall be performed by the members of the Board of Contract Appeals in addition to their regular duties in the Department.

* * * * *

(R.S. 161, as amended; 5 U.S.C. 22, 39 U.S.C. 309, 501)

HARVEY H. HANNAH,
Acting General Counsel.

[F.R. Doc. 65-14008; Filed, Dec. 29, 1965; 10:37 a.m.]

DEPARTMENT OF THE INTERIOR

Bureau of Land Management

ALASKA

Notice of Filing of Plat of Survey

DECEMBER 22, 1965.

1. Plat of survey of the lands described below will be officially filed in the Anchorage District and Land Office, Anchorage, Alaska, effective at 10 a.m., January 15, 1966.

SEWARD MERIDIAN

T. 2 S., R. 13 W.,
Sec. 3, lots 1 and 2, SW¼, S½NW¼;
Sec. 4, lots 1, 2, 3, 4, S½NE¼, S½NW¼, SE¼, SW¼;
Sec. 5, lots 1, 2, 3, 4, 5, 6, S½NE¼, SE¼NW¼, S½SW¼, NE¼SW¼, SE¼;
Sec. 6, lots 1, 2, 3, 4, 5, 6, 7, 8, S½NE¼, SE¼NW¼, E½SW¼, S½SE¼;
Sec. 7, lots 1, 2, 3, 4, NE¼, E½NW¼, E½SW¼, SE¼;
Sec. 8, all;
Sec. 9, all;
Sec. 16, N½;
Sec. 17, N½.

Containing 4,709.01 acres.

2. The area surveyed is located in the Ninilchik area on the Kenai Peninsula.

3. The public lands affected by this order are hereby restored to the operation of the public land laws, subject to any valid existing rights, the provisions of existing withdrawals, and the requirements of applicable law, rules and regulations.

4. The greater part of the lands affected by this notice has been selected by the State of Alaska in accordance with and subject to the limitations and requirements of the Alaska Statehood Act of July 7, 1958 (72 Stat. 339), and the regulations in 43 CFR 2222.9–1(a) and 43 CFR Part 1840.

5. Inquiries concerning the lands should be addressed to the Manager, Anchorage District and Land Office, 555 Cordova Street, Anchorage, Alaska.

PEARL C. PETERS,
Acting Manager, Anchorage District and Land Office.

[F.R. Doc. 65-13916; Filed, Dec. 29, 1965; 8:46 a.m.]

[Sacramento 080090]

CALIFORNIA

Notice of Proposed Withdrawal and Reservation of Lands

DECEMBER 17, 1965.

On December 6, 1965, the Department of the Army, Portland District, Corps of Engineers, filed application Sacramento 080090 for the withdrawal of the lands described below in connection with the planning studies for the Applegate Reservoir Project on the upper Ap-

plegate River, a tributary of the Rogue River, in Jackson County, Oreg., including flowage which could extend into Siskiyou County, Calif.

The purpose for which the withdrawal is requested is for use of the lands in connection with construction, operation, and maintenance of the project. The withdrawal is requested from all forms of appropriation under the public land laws, subject to valid existing rights, including the mining laws and mineral leasing laws.

For a period of 30 days from the date of publication of this notice, all persons who wish to submit comments, suggestions, or objections in connection with the proposed withdrawal may present their views in writing to the undersigned officer of the Bureau of Land Management, Department of the Interior, Room 4201, U.S. Courthouse and Federal Building, 650 Capitol Mall, Sacramento, Calif., 95814.

The Department's regulation (43 CFR 2311.1–3(c)) provide that the authorized officer of the Bureau of Land Management will undertake such investigations as are necessary to determine the existing and potential demand for the lands and their resources. He will also undertake negotiations with the applicant agency with the view of adjusting the application to reduce the area to the minimum essential to meet the applicant's needs, to provide for the maximum concurrent utilization of the lands for purposes other than the applicant's, to eliminate lands needed for purposes more essential than the applicant's, and to reach agreement on the concurrent management of the lands and their resources.

The authorized officer will also prepare a report for consideration by the Secretary of the Interior who will determine whether or not the lands will be withdrawn as requested by the applicant agency.

The determination of the Secretary on the application will be published in the FEDERAL REGISTER. A separate notice will be sent to each interested party of record.

If circumstances warrant, a public hearing will be held at a convenient time and place, which will be announced.

MOUNT DIABLO MERIDIAN

ROGUE RIVER NATIONAL FOREST

T. 48 N., R. 11 W.,
Sec. 17, lots 2, 3, and 4, S½SW¼ and SW¼SE¼;
Sec. 18, lot 1 and SE¼SE¼;
Sec. 20, NW¼NE¼ and NE¼NW¼.

The area described above aggregates approximately 373.52 acres.

R. J. LITTEN,
Chief, Lands Adjudication Section, Sacramento Land Office.

[F.R. Doc. 65-13918; Filed, Dec. 29, 1965; 8:47 a.m.]

IDAHO

Notice of Filing of Idaho Protraction Diagrams

DECEMBER 21, 1965.

Notice is hereby given that effective at and after 10:00 a.m., on January 25, 1966, the following protraction diagrams are officially filed of record in the Idaho Land Office, Room 327, Federal Building, Boise, Idaho, 83701, and are available to the public as a matter of information only. In accordance with Title 43, Code of Federal Regulations, these protractions will become the basic record for describing the land for all authorized uses. Until this date and time the diagrams have been placed in open file and are available to the public for information only.

IDAHO PROTRACTION DIAGRAMS

Nos. 85, 93, 94

BOISE MERIDIAN

Approved November 8, 1965

No. 93

Ts. 5 and 6 N., Rs. 20, 21 and 22 E.

BOISE MERIDIAN

Approved November 15, 1965

No. 85

T. 7 N., Rs. 17, 18 and 19 E.
T. 8 N., Rs. 18 and 19 E.

No. 94

T. 5 N., Rs. 17 and 19 E.
T. 6 N., Rs. 17, 18 and 19 E.

Copies of these diagrams are for sale at one dollar ($1.00) each by the Cadastral Engineering Office, Bureau of Land Management, Post Office Box 2237, Boise, Idaho, 83701.

EUGENE E. BABIN,
Acting Manager, Land Office, Boise, Idaho.

[F.R. Doc. 65-13919; Filed, Dec. 29, 1965; 8:47 a.m.]

IDAHO

Notice of Filing of Plat of Survey

DECEMBER 21, 1965.

1. Plats of survey of the following described land, accepted December 9, 1965, will be officially filed in the Land Office, Boise, Idaho, effective at 10 a.m., on January 25, 1966.

BOISE MERIDIAN, IDAHO

T. 2 N., R. 37 E.,
Sec. 12, lots 9 to 15 inclusive;
Sec. 13, lots 9 to 213 inclusive;
Sec. 24, lot 8;
Sec. 25, lots 8 to 19 inclusive;
Sec. 35, lots 8 and 9.

The areas described aggregate 187.94 acres.

2. The lands include an island in the Snake River and other lands along the river which were omitted from the previous survey.

3. The lands are subject to the provisions of the Act of May 31, 1962 (76 Stat. 89). Before sale of any of the lands described herein can be made, a notice in accordance with the regulations in 43 CFR 2214.6–1 must be published in the FEDERAL REGISTER. Inquiries concerning the lands should be addressed to the Manager, Idaho Land Office, Post Office Box 2237, Boise, Idaho, 83701.

EUGENE E. BABIN,
Acting Manager, Land Office, Boise, Idaho.

[F.R. Doc. 65-13920; Filed, Dec. 29, 1965; 8:47 a.m.]

[Oregon 017362]

OREGON

Notice of Proposed Withdrawal and Reservation of Land

DECEMBER 21, 1965.

The Forest Service, U.S. Department of Agriculture, has filed an application, Serial Number Oregon 017362 for the withdrawal of the lands described below, from all forms of appropriation under the mining laws (Chap. 2, 30 U.S.C.) but not from leasing under the mineral leasing laws.

The applicant desires to use the land for an existing recreation area complex.

For a period of 30 days from the date of publication of this notice, all persons who wish to submit comments, suggestions, or objections in connection with the proposed withdrawal may present their views in writing to the undersigned officer of the Bureau of Land Management, Department of the Interior, 710 Northeast Holladay, Portland, Oreg., 97232.

The authorized officer of the Bureau of Land Management will undertake such investigations as are necessary to determine the existing and potential demand for the lands and their resources. He will also undertake negotiations with the applicant agency with the view of adjusting the application to reduce the area to the minimum essential to meet the applicant's needs, to provide for the maximum concurrent utilization of the lands for purposes other than the applicant's, to eliminate lands needed for purposes more essential than the applicant's, and to reach agreement on the concurrent management of the lands and their resources.

He will also prepare a report for consideration by the Secretary of the Interior who will determine whether or not the lands will be withdrawn as requested by the Forest Service.

The determination of the Secretary on the application will be published in the FEDERAL REGISTER. A separate notice will be sent to each interested party of record.

If circumstances warrant it, a public hearing will be held at a convenient time and place, which will be announced.

The lands involved in the application are:

OREGON

WILLAMETTE MERIDIAN

WILLAMETTE NATIONAL FOREST

Breitenbush Hot Springs Recreation Area

T. 9 S., R. 7 E.,
Sec. 19, Unsurveyed, S½NE¼NE¼, NE¼SW¼NE¼, S½SW¼NE¼, SE¼NE¼, SE¼SE¼NW¼, NE¼NE¼SW¼, N½NW¼SE¼;
Sec. 20, S½NE¼NW¼, NW¼NW¼, N½SW¼NW¼, SE¼NW¼, NE¼SE¼, E½SE¼SE¼;

Sec. 21, Unsurveyed, S½NW¼NW¼, SW¼NW¼, W½NE¼SW¼, NW¼SW¼, N½SW¼SW¼, SW¼SW¼SW¼, N½SE¼SW¼.

The areas described aggregate 480 acres.

D. B. LEIGHTNER,
Acting Land Office Manager.

[F.R. Doc. 65-13921; Filed, Dec. 29, 1965; 8:47 a.m.]

[Oregon 017358]

OREGON

Notice of Proposed Withdrawal and Reservation of Land

DECEMBER 22, 1965.

The Bureau of Land Management, U.S. Department of the Interior, has filed an application, Serial No. Oregon 017358 for the withdrawal of the lands described below, from all forms of appropriation under the public land laws, including the mining but not the mineral leasing laws, or disposal of materials under the Act of July 31, 1947 (61 Stat. 681; 30 U.S.C. 601-604), as amended, or forest products under the Act of August 28, 1937 (50 Stat. 874; 43 U.S.C. 1181a), subject to valid existing rights.

The applicant desires the land for protection of a site containing hard rock deposits to be used for repair and construction of Governmental and private roads.

For a period of 30 days from the date of publication of this notice, all persons who wish to submit comments, suggestions, or objections in connection with the proposed withdrawal, may present their views in writing to the undersigned officer of the Bureau of Land Management, Department of the Interior, 710 Northeast Holladay, Portland, Oreg., 97232.

The authorized officer of the Bureau of Land Management will prepare a report for consideration by the Secretary of the Interior who will determine whether or not the lands will be withdrawn as requested by the Bureau of Land Management.

The determination of the Secretary on the application will be published in the FEDERAL REGISTER. A separate notice will be sent to each interested party of record.

If circumstances warrant it, a public hearing will be held at a convenient time and place, which will be announced.

The lands involved in the application are:

OREGON

WILLAMETTE MERIDIAN

T. 27 S., R. 12 W.,
Sec. 3, lots 1 and 2, S½NE¼ and SE¼.

The area described contains 321.45 acres.

D. B. LEIGHTNER,
Acting Land Office Manager.

[F.R. Doc. 65-13922; Filed, Dec. 29, 1965; 8:47 a.m.]

[Oregon 017357]

OREGON

Notice of Proposed Withdrawal and Reservation of Land

DECEMBER 21, 1965.

The Bureau of Land Management, U.S. Department of the Interior, has filed an application, Serial Number Oregon 017357 for the withdrawal of the lands described below, from all forms of appropriation under the public land laws, including the mining laws (Chap. 2, 30 U.S.C.) but not including the mineral leasing laws or disposal of materials under the Act of July 31, 1947 (61 Stat. 681; 30 U.S.C. 601-604), as amended.

The applicant desires the land for preservation of antiquity values, and after exploration is completed, the land will be developed and used for public outdoor recreation.

For a period of 30 days from the date of publication of this notice, all persons who wish to submit comments, suggestions, or objections in connection with the proposed withdrawal may present their views in writing to the undersigned officer of the Bureau of Land Management, Department of the Interior, 710 Northeast Holladay, Portland, Oreg., 97232.

The authorized officer of the Bureau of Land Management will prepare a report for consideration by the Secretary of the Interior who will determine whether or not the lands will be withdrawn as requested by the Bureau of Land Management.

The determination of the Secretary on the application will be published in the FEDERAL REGISTER. A separate notice will be sent to each interested party of record.

If circumstances warrant it, a public hearing will be held at a convenient time and place, which will be announced.

The lands involved in the application are:

OREGON

WILLAMETTE MERIDIAN

T. 2 S., R. 15 E.,
Sec. 13, S½SW¼ and SW¼SE¼;
Sec. 24, NW¼NE¼ and N½NW¼.

The area described contains 240 acres.

D. B. LEIGHTNER,
Acting Land Office Manager.

[F.R. Doc. 65-13923; Filed, Dec. 29, 1965; 8:47 a.m.]

[Riverside 0126]

CALIFORNIA

Notice of Termination of Proposed Withdrawal and Reservation of Lands

DECEMBER 22, 1965.

The Forest Service, U.S. Department of Agriculture filed an application for withdrawal and reservation of lands, serial number Riverside 0126, on January 2, 1962 (27 F.R. 1783-1784). The applicant agency has canceled its application insofar as it involved the lands described below. Therefore, pursuant to the regulations contained in 43 CFR Part 2310, such lands will be at 10 a.m., on Monday, January 24, 1966, relieved of the segregative effect of the above-mentioned application.

The lands involved in this notice of termination are:

SAN BERNARDINO MERIDIAN, CALIFORNIA

T. 3 S., R. 1 E.,
Sec. 30, SE¼SE¼SW¼NE¼, S½SW¼SE¼NE¼, NE¼SW¼SE¼NE¼, S½NE¼SE¼NE¼, SE¼SE¼NE¼, E½SW¼, SE¼;
Sec. 34, S½NW¼NW¼.
T. 4 S., R. 1 E.,
Sec. 20, SE¼SW¼;
Sec. 33, S½;
Sec. 34, W½, W½E½, SE¼SE¼.
T. 3 S., R. 1 W.,
Sec. 32, E½SE¼.

HALL H. MCCLAIN,
Manager.

[F.R. Doc. 65-13917; Filed, Dec. 29, 1965; 8:47 a.m.]

Office of the Secretary

CLOVERDALE RANCHERIA, CALIF.

Termination of Federal Supervision Over Property and Individual Members Thereof

Notice is hereby given that the Indians and the dependent members of their immediate families named below are no longer entitled to any of the services performed by the United States for Indians because of their status as Indians; that all statutes of the United States which affect Indians because of their status as Indians shall be inapplicable to them, and the laws of the several States shall apply to them in the same manner as they apply to other citizens within their jurisdiction. Title to the land on the Cloverdale Rancheria has passed from the U.S. Government under the distribution plan approved August 13, 1959, for the rancheria.

Cloverdale Rancheria, described as follows: All these certain lots, pieces or parcels of land, situate, lying and being in the township of Cloverdale, county of Sonoma, State of California, and bounded and particularly described as follows; to with: Beginning at a point in the center of the main public road leading from Cloverdale to Healdsburg and at the northwesterly corner of the land formerly owned by Louis Bee, which is an iron pipe two (2) inches in diameter, two (2) feet long, driven below the surface of the ground, from which a fir tree five (5) feet in diameter marked "R.M.," and known as station 8 on the Musalacon Grant line bears south 47° W., 39.38 chains distant; thence N. 47°40' E., along the northerly line of the land formerly owned by Louis Bee, 49.25 chains; thence north 59°15' W., 6.07½ chains to the southerly line of the land of Helena M. Woolsey, thence S. 47°28' W., along the southerly line of the land of Helena M. Woolsey, 46.68 chains to the center line of the hereinbefore mentioned public road; thence S. 34°15' E., along the center line of said road 5.71 chains to the place of beginning, containing 27.50 acres.

Name	Birth date	Address
Ernest Buck	5- 9-1909	28640 Redwood Highway, 101 South, Cloverdale, Calif.
Virginia Buck	7- 6-1909	Same.
Cari Buck	9-19-1944	Same.
Stephanie Stanley	4-10-1949	Same.
Blanche Hermosillo	6- 7-1915	General Delivery, Cloverdale, Calif.
Karen Hermosillo	6-21-1953	Same.
Carmelita Hermosillo	8-30-1954	Same.
Ricardo Hermosillo	3- 5-1958	Same.
Elaine Willits	9- 4-1945	Same.
John Santana	2-17-1916	Post Office Box 425, Cloverdale, Calif.
Carmen Santana	2-28-1923	Same.
Gerald Santana	10-11-1944	Same.
Linda Santana	11-27-1945	Same.
Antoinette Santana	10-31-1948	Same.
Patty Santana	4- 9-1957	Same.
Agnes Santana	1877	Same.
Patrick Dollar	3-17-1940	Same.
Lillian Jack	5-10-1909	General Delivery, Cloverdale, Calif.
Eugene Jack	3-11-1943	Same.
Alvin Jack	6-26-1949	Same.

This notice is issued pursuant to the Act of August 18, 1958 (72 Stat. 619), amended August 11, 1964 (78 Stat. 390), including the provisions in the 1964 Act that this notice affects only those Indians who are not members of any other tribe or band of Indians, and that all restrictions and tax exemptions applicable to trust or restricted lands or interests therein owned by the Indians who are affected by this notice are terminated.

This notice becomes effective as of the date of publication in the FEDERAL REGISTER.

STEWART L. UDALL,
Secretary of the Interior.

DECEMBER 23, 1965.

[F.R. Doc. 65-13925; Filed, Dec. 29, 1965; 8:47 a.m.]

DEPARTMENT OF AGRICULTURE

Office of the Secretary

MEAT IMPORT LIMITATIONS

1966 Estimates

P.L. 88-482, approved August 22, 1964 (hereinafter referred to as the Act), provides for limiting the quantity of fresh, chilled, or frozen cattle meat (TSUS 106.10) and fresh, chilled, or frozen meat of goats and sheep, except lamb (TSUS 106.20), which may be imported into the United States in any calendar year. Such limitations are to be imposed when it is estimated by the Secretary of Agriculture that imports of such articles, in the absence of limitations during such calendar year, would equal or exceed 110 percent of the estimated quantity of such articles prescribed by section 2(a) of the Act.

In accordance with the requirements of the Act, the following calendar year 1966 estimates are published:

1. The estimated aggregate quantity of such articles which would, in the absence of limitations under the Act, be imported during calendar year 1966 is 700 million pounds.

2. The estimated quantity of such articles prescribed by section 2(a) of the Act during the calendar year 1966 is 890.1 million pounds.

Since the estimated quantity of imports does not equal or exceed 110 percent of the estimated quantity prescribed by section 2(a) of the Act, no limitations for the calendar year 1966 on the importation of fresh, chilled, or frozen cattle meat (TSUS 106.10) and fresh, chilled, or frozen meat of goats and sheep, except lamb (TSUS 106.20), are authorized to be imposed pursuant to P.L. 88-482 at this time.

Done at Washington, D.C., this 27th day of December 1965.

ORVILLE L. FREEMAN,
Secretary.

[F.R. Doc. 65-13941; Filed, Dec. 29, 1965; 8:49 a.m.]

ATOMIC ENERGY COMMISSION

[Docket No. 27-40]

ATOMIC DISPOSAL CO., INC.

Notice of Issuance of Byproduct and Source Material License

Please take notice that no request for a hearing or petition for leave to intervene has been filed following publication of the notice of proposed issuance of byproduct and source material license. The Atomic Energy Commission has this date issued license No. 12-11286-1. The license is in the form set forth in the notice of proposed issuance published in the FEDERAL REGISTER on October 20, 1965, 30 F.R. 13335.

Dated at Bethesda, Md., December 22, 1965.

For the Atomic Energy Commission.

J. A. MCBRIDE,
Director,
Division of Materials Licensing.

[License No. 12-11286-1]

The Atomic Energy Commission having found that:

A. The applicant's equipment, facilities, and procedures are adequate to protect health and minimize danger to life or property.

B. The applicant is qualified by training and experience to conduct the proposed operations in such manner as to protect health and minimize danger to life or property.

C. The application, dated December 23, 1964, and amendments thereto, dated February 18, 1965; April 20, 1965; July 15, 1965; August 16, 1965; and undated document, received August 30, 1965, comply with the requirements of the Atomic Energy Act of 1954, as amended, and Title 10, Code of Federal Regulations, Chapter I, and is for a purpose authorized by that act, and

D. The issuance of the license will not be inimical to the common defense and security or to the health and safety of the public.

License No. 12-11286-1 is hereby issued to read as follows:

Pursuant to the Atomic Energy Act of 1954, as amended, 10 CFR Part 30, "Rules of General Applicability to Licensing of Byproduct Material," 10 CFR Part 40, "Licensing of Source Material," and in reliance upon the statements and representations contained in the application, dated December 23, 1964, and amendments thereto, dated February 18, 1965; April 20, 1965; July 15, 1965; August 16, 1965; and undated document, received August 30, 1965, a license is hereby issued to receive at customers' facilities or at a facility located at 21621 Oak Street, Matteson, Ill., transport to and store at a facility located at 21621 Oak Street, Matteson, Ill., waste byproduct and source material, and to dispose of these materials by transfer to authorized land burial sites.

This license shall be deemed to contain the conditions specified in section 183 of the Atomic Energy Act of 1954, as amended, and is subject to the provisions of 10 CFR Part 20, "Standards for Protection Against Radiation," all other applicable rules, regulations, orders of the Atomic Energy Commission now or hereafter in effect, and to the following conditions:

1. The licensee shall not possess at any one time more than:

A. 1,000 curies of Hydrogen 3;

B. 1,000 curies of other byproduct material;

C. 15,000 pounds of source material.

2. Operations shall be conducted by Carl J. Collica. Operations may be conducted by Thomas Philip, James Winans, and/or Frank Pastorelle upon completion of the training program described in the application.

3. The transportation of AEC-licensed material shall be subject to the applicable regulations of the Interstate Commerce Commission, U.S. Coast Guard and other agencies of the United States having appropriate jurisdiction, and where such regulations are not applicable shall be in accordance with the following requirements except as specifically provided by the Atomic Energy Commission:

A. *Outside shipping containers.* (1) The containers shall meet any one of the following specifications described in Appendix A attached hereto:

a. Specification 15A, 15B, 12B, 6A, 6B, 17C, 17H, 19A, or 19B for the containment of radioactivity in amounts not in excess of 2.7 curies; except polonium, 2 curies; or

b. Specification 55 for containment of solid cobalt 60, cesium 137, iridium 192, or gold 198 in amounts not in excess of 300 curies.

(2) There shall be no radioactive contamination on any exterior surface of the container in excess of 500 d/m/100 sq. cm. alpha and 0.1 mrem/hr beta-gamma radiation.

(3) The smallest dimension of the container shall not be less than 4 inches.

(4) The radiation level at any accessible surface of the container shall not exceed 200 mrem/hr.

(5) At one meter from any point on the radioactive source the radiation level shall not exceed 10 mrem/hr.

(6) Containers which contain radioactive material emitting only alpha and/or beta radiation shall contain sufficient shielding to prevent the escape of primary corpuscular radiation to the exterior surface so that it does not exceed 10 mrem/24 hours at any time during transportation.

B. *Inside containers.* (1) Solid and gaseous radioactive materials shall be packed in suitable inside containers designed to prevent rupture and leakage under conditions incident to transportation.

(2) Liquid radioactive materials must be packed in sealed glass, earthenware, or other suitable containers. The container must be surrounded on all sides by an absorbent material sufficient to absorb the entire liquid contents and be of such nature that its efficiency will not be impaired by chemical reactions with the contents. Where shielding is required the absorbent material must be placed within the shield. If the inside container meets the Specification 2R in Appendix A the absorbent material is not required.

(3) Materials containing radioisotopes of plutonium, americium, polonium, or curium, or the isotope strontium 90, in quantities in excess of 100 microcuries, must be packed in containers which meet Specification 2R in Appendix A.

C. *Shielding.* Inside containers must be completely surrounded with sufficient shielding to meet the requirements of subparagraphs A(4), A(5), and A(6) of this condition. The shield must be so designed that it will not open or break under conditions incident to transportation.

D. *Labeling.* Each outside container label required under § 20.203(f) of 10 CFR Part 20 shall bear the following information:

(1) Total activity in millicuries, or in the case of source and special nuclear material, the total weight;

(2) principal radioisotope;

(3) radiation level at the surface of the container and at one meter from the source; and

(4) the name and address of the licensee.

E. Each vehicle in which licensed material is transported shall be marked or placarded on each side and the rear with lettering at least 3 inches high as follows: "DANGEROUS—RADIOACTIVE MATERIAL."

F. *Accidents.* In the event of an accident involving any vehicle transporting licensed material, immediate steps shall be taken to prevent radioactive exposure of persons and to control contamination.

G. *Exemptions.* Specific approval must be obtained from the Atomic Energy Commission for modification of, or exemption from, the requirements of this license condition. Requests for such approval should be directed to the Chief, Isotopes Branch, Division of Materials Licensing, Atomic Energy Commission, and should contain sufficient information to support such a request.

4. The licensee shall store byproduct and source material only at its facility located at 21621 Oak Street, Matteson, Ill.

5. The licensee shall not open packages containing byproduct and source material.

6. Except as specifically provided otherwise by this license, the licensee shall receive, transport, store, and dispose of byproduct and source material in accordance with the procedures and limitations contained in the application, dated December 23, 1964, and amendments thereto, dated February 18, 1965; April 20, 1965; July 15, 1965; August 16, 1965; and undated document, received August 30, 1965.

This license shall be effective on the date issued and shall expire 2 years from the last day of the month in which this license is issued.

Dated at Bethesda, Md., December 22, 1965.

For the Atomic Energy Commission.

J. A. McBride,
Director,
Division of Materials Licensing.

[F.R. Doc. 65-13893; Filed, Dec. 29, 1965; 8:45 a.m.]

[Docket No. 50-227]

GENERAL DYNAMICS CORP.

Notice of Issuance of Construction Permit Amendment

Please take notice that the Atomic Energy Commission has issued, effective as of the date of issuance, Amendment No. 1 to Construction Permit No. CPRR-89 which authorizes General Dynamics Corp. to construct the Torrey Pines TRIGA Mark III nuclear reactor located at Torrey Pines Mesa, Calif. The amendment authorizes the insertion into the reactor for testing purposes of four control rods having fueled followers and one instrumented fuel element as described in the application amendment dated December 17, 1965.

Within fifteen (15) days from the date of publication of this notice in the Federal Register, the applicant may file a request for a hearing and any person whose interest may be affected by this proceeding may file a petition for leave to intervene. Requests for a hearing and petitions to intervene shall be filed in accordance with the Commission's regulation (10 CFR Part 2). If a request for a hearing or a petition for leave to intervene is filed within the time prescribed in this notice, the Commission will issue a notice of hearing or an appropriate order.

For further details with respect to this amendment, see (1) the licensee's application for amendment dated December 17, 1965, and (2) the Safety Evaluation prepared by the Test and Power Reactor Safety Branch of the Division of Reactor Licensing, all of which are available for public inspection at the Commission's Public Document Room, 1717 H Street NW., Washington, D.C. A copy of item (2) above may be obtained at the Commission's Public Document Room or upon request addressed to the Atomic Energy Commission, Washington, D.C., 20545, Attention: Director, Division of Reactor Licensing.

Dated at Bethesda, Md., this 21st day of December 1965.

For the Atomic Energy Commission.

R. L. Doan,
Director,
Division of Reactor Licensing.

Amendment to Construction Permit

[Construction Permit No. CPRR-89; Amdt. 1]

The Commission has found that:

(1) The application for amendment complies with the requirements of the Atomic Energy Act of 1954, as amended, and the Commission's regulations set forth in Title 10, Chapter I, CFR;

(2) Testing of the reactor components in accordance with the permit, as amended, will not be inimical to the common defense and security or to the health and safety of the public.

(3) Prior public notice of proposed issuance of the amendment is not required since the amendment does not involve significant hazards considerations different from those previously evaluated.

Construction Permit No. CPRR-89, issued to General Dynamics Corp., is amended by adding a new subparagraph C. to paragraph 3. as follows:

"C. General Dynamics Corp. is authorized in the construction of the facility to insert into the reactor for testing purposes four control rods having fueled followers and one instrumented fuel element."

This amendment is effective as of the date of issuance.

Date of issuance: December 21, 1965.

For the Atomic Energy Commission.

Director,
Division of Reactor Licensing.

[F.R. Doc. 65-13894; Filed, Dec. 29, 1965; 8:45 a.m.]

CIVIL AERONAUTICS BOARD

[Docket No. 16236; Order E-23023]

INTERNATIONAL AIR TRANSPORT ASSOCIATION

Order Relating to Specific Commodity Rates

Adopted by the Civil Aeronautics Board at its office in Washington, D.C., on the 22d day of December 1965.

Agreements have been filed with the Board, pursuant to section 412(a) of the Federal Aviation Act of 1958 (the Act) and Part 261 of the Board's Economic Regulations, between various air carriers, foreign air carriers, and other carriers, embodied in the resolutions of Traffic Conference 1 and Joint Conferences 3-1 and 1-2-3 of the International Air Transport Association (IATA), and adopted pursuant to the provisions of Resolution 590 dealing with specific commodity rates.

The agreements, adopted pursuant to unprotested notices to the carriers and promulgated in IATA letters, dated December 9 and 10, 1965,[1] as set forth in the attachment hereto name additional specific commodity rates for existing commodity descriptions. The agreements reflect reductions in rates ranging from 25.0 to 58.9 percent of the otherwise applicable rates and are consistent with the present specific commodity rates within the applicable areas.

The Board, acting pursuant to sections 102, 204(a), and 412 of the Act, does not find the subject agreements to be adverse to the public interest or in violation of the Act, provided that approval thereof is conditioned as hereinafter ordered.

Accordingly, it is ordered, That Agreement CAB 18169, R-38 and Agreement CAB 18504, R-7 and R-8, be approved, provided that approval shall not constitute approval of the specific commodity descriptions contained therein for purposes of tariff publication.

Any air carrier party to the agreement, or any interested person, may, within 15 days from the date of service of this order, submit statements in writing containing reasons deemed appropriate, together with supporting data, in support of or in opposition to the Board's action herein. An original and 19 copies of the statements should be filed with the Board's Docket Section. The Board may, upon consideration of any such statements filed, modify or rescind its action herein by subsequent order.

This order will be published in the Federal Register.

By the Civil Aeronautics Board.

[SEAL] Harold R. Sanderson,
Secretary.

[1] Received in the Board Dec. 13, 1965.

Agreement CAB 18169, R-38, IATA Letter, dated December 10, 1965, Commodity Item 9008—Costume Jewelry, Articles de Paris, Ornaments, and parts thereof, N.E.S., excluding Original Works of Art, Antiques, Watches and Clocks, 183 cents per kg., minimum weight 300 kgs. Bombay to New York.

Agreement CAB 18504, R-7, IATA Letter, dated December 9, 1965, Commodity Item 0300—Fish and Seafood, N.E.S., 22 cents per kg., minimum weight 500 kgs. Port au Prince to New York.

Agreement CAB 18504, R-8, IATA Letter, dated December 9, 1965, Commodity Item 1421—Cut Flowers, including Mimosa, 30 cents per kg., minimum weight 100 kgs. Bogota to San Juan.

[F.R. Doc. 65-13933; Filed, Dec. 29, 1965; 8:48 a.m.]

FEDERAL COMMUNICATIONS COMMISSION

[Docket No. 15752 etc.; FCC 65-1154]

CHARLES W. JOBBINS ET AL.

Memorandum Opinion and Order Amending Issues

In re applications of Charles W. Jobbins, Costa Mesa-Newport Beach, Calif., Docket No. 15752, File No. BP-16157; et al.; Docket Nos. 15754, 15755, 15756, 15757, 15758, 15759, 15760, 15762, 15763, 15764, 15765, 15766; for construction permits.

1. This proceeding now involves 13 applications for new standard broadcast stations to operate on 1110 kilocycles, which is the frequency formerly used by Station KRLA in Pasadena, Calif. Seven of these applications, Goodson-Todman Broadcasting, Bible Institute of Los Angeles, Crown City Broadcasting, Pasadena Community Station, Voice in Pasadena, Western Broadcasting, and Pasadena Broadcasting Co., propose to operate a class II station with 50,000 watts until local sunset and 10,000 watts thereafter, using directional antennas, at Pasadena. Two other applicants, California Regional Broadcasting and Storer Broadcasting, propose fulltime operation with 50,000 watts and directional antennas at Pasadena. Orange Radio and Pacific Fine Music, applicants for Fullerton and Whittier, Calif., respectively, also propose directional operation with 50,000 watts until sunset and with 10,000 watts at night. Charles W. Jobbins proposes daytime only, nondirectional operation with 1,000 watts at Costa Mesa-Newport Beach, Calif., and Topanga Malibu Broadcasting proposes fulltime, directional operation with 500 watts at Topanga, Calif. Each of the specified station locations is within, or very near, the Los Angeles-Long Beach urbanized area as delineated by the Bureau of the Census in the 1960 census of population.

2. In considering a petition to enlarge the issues in this proceeding, the Review Board concluded (FCC 65R-185, released May 24, 1965) that separate community and 10 percent rule issues should be added to determine whether the Orange Radio and Pacific Fine Music proposals are intended to serve their specified communities or the surrounding area. Orange Radio thereafter filed an application for review of the Board's action. Because this proceeding involved important policy questions similar to those in two other proceedings, the Commission by order (FCC 65-592, released July 9, 1965), granted the application for review and the parties were permitted to file briefs and to present arguments before the Commission, en banc, on October 8, 1965. The briefs and arguments of the parties in this proceeding have provided valuable assistance in clarifying the standards that should be applied to determine which application would better serve the public interest when one or more of the proposed stations is to be located in a suburban community and would serve adjacent metropolitan areas.

3. Our examination of these applications reveals that each of the applicants proposes 5 mv/m daytime service within the geographic boundaries of at least one other community of over 50,000 persons and with a population at least twice as large as that of the applicant's specified location. Accordingly, we are persuaded, for the reasons stated in our policy statement (FCC 65-1153), adopted December 22, 1965, that a determination should be made in this proceeding whether each of these suburban proposals will realistically serve its own specified station location or some other larger community. We shall therefore revise the issues in this proceeding so that, in addition to the usual 307(b) evidence concerning the independence of a suburban community from its central city, the parties may fully explore all matters relating to the need for each of these proposals. Thus, each of the applicants will be expected to show the extent to which he has ascertained that his specified station location has separate and distinct programming needs, the extent to which these needs are not being met by existing standard broadcast stations, and the extent to which his program proposals will meet these needs. Additionally, each of the applicants will be expected to adduce evidence as to whether the projected sources of advertising revenues from within his specified station location are adequate to support his proposal as compared with his projected sources from all other areas.

4. An applicant who fails to establish that he will realistically serve his specified station location under the programming and revenues issue will be deemed to propose to serve the most populous community whose geographic boundaries are penetrated by his 5 mv/m daytime contour, unless the evidence establishes that he will realistically serve a third community whose boundaries are also penetrated by his 5 mv/m daytime contour.[1] Accordingly, an issue will also be added to determine whether those applicants meet all of the technical provisions of our rules for a station assigned to the appropriate larger community. Insofar as the "10 percent rule" applies to the applications in this proceeding and to others filed prior to the revision of our AM rules on August 13, 1964, we are persuaded that the applicants should also be required to show either that their proposals will comply with the "10 percent rule" or that they are entitled to a waiver of the "10 percent rule." Thus, an applicant who would comply with the "10 percent rule" if his proposal is deemed to be one for his specified station location, but whose proposal is determined to be one for some other community, will also be required to establish that his proposal for that latter community complies with the "10 percent rule" or that he is entitled to waiver of the "10 percent rule." Finally, the burden of proof with respect to these additional issues will be upon the individual applicants in each instance.

Accordingly, it is ordered, This 22d day of December 1965, that the first three issues added to this proceeding by the Review Board's Memorandum Opinion and Order, FCC 65R-185, released May 24, 1965, are hereby revised, and that the issues in this proceeding are hereby enlarged as follows:

(a) To determine whether each of the proposals will realistically provide a local transmission facility for its specified station location or for another larger community, in light of all of the relevant evidence, including, but not necessarily limited to, the showing with respect to:

(1) The extent to which each specified station location has been ascertained by each applicant to have separate and distinct programming needs;

(2) The extent to which the needs of each specified station location are being met by existing standard broadcast stations;

(3) The extent to which each applicant's program proposal will meet the specific unsatisfied programming needs of his specified station location; and

(4) The extent to which the projected sources of each applicant's advertising revenues within his specified station location are adequate to support his proposal, as compared with his projected sources from all other areas.

(b) To determine, in the event that it is concluded pursuant to the foregoing issue (a) that one or more of the proposals will not realistically provide a local transmission service for its specified station location, whether each such proposal meets all of the technical provisions of the rules, including §§ 73.30, 73.31 and 73.188(b) (1) and (2), for standard broadcast stations assigned to the most populous community for which it is determined that the proposal will realistically provide a local transmission service.

(c) To determine, in the event that it is concluded pursuant to the foregoing issue (a) that Orange Radio, Inc., Pacific Fine Music, Inc., or Topanga Malibu Broadcasting Co. will not realistically provide a local transmission service for its specified station location, whether the most populous community for which

[1] See paragraph 11 and especially footnote 1 appended thereto of our policy statement, supra, for the effect of such service to a third community.

it is determined that each of these three applicants will provide a realistic local transmission service, has any standard broadcast nighttime facility, or whether the interference which would be received by each of these three applicants would affect more than 10 percent of the population within its normally protected primary service area in contravention of § 73.28(d)(3) of the rules, and, if so, whether circumstances exist which would warrant a waiver of that section of the rules.

Released: December 27, 1965.

FEDERAL COMMUNICATIONS COMMISSION,
[SEAL] BEN F. WAPLE,
Secretary.

[F.R. Doc. 65-13946; Filed, Dec. 29, 1965; 8:49 a.m.]

[Docket Nos. 14755-14757; FCC 65-1156]

JUPITER ASSOCIATES, INC., ET AL.

Memorandum Opinion and Order Amending Issues

In re applications of Jupiter Associates, Inc., Matawan, N.J., Docket No. 14755, File No. BP-14178; William S. Halpern and Louis N. Seltzer d/b as Somerset County Broadcasting Co., Somerville, N.J., Docket No. 14756, File No. BP-14234; Radio Elizabeth, Inc., Elizabeth, N.J., Docket No. 14757, File No. BP-14812; for construction permits.

1. This proceeding involves the mutually exclusive applications for construction permits to operate new class II standard broadcast stations, daytime only, on 1530 kilocycles, of (a) Jupiter Associates, Inc. (hereinafter Jupiter), which proposes directional operation with 500 watts of power at Matawan, N.J.; (b) William S. Halpern and Louis N. Seltzer, d/b as Somerset County Broadcasting Company (hereinafter Somerset), which proposes directional operation with 1000 watts of power at Somerville, N.J.; and (c) Radio Elizabeth, Inc. (hereinafter Radio), which proposes nondirectional operation with 500 watts of power at Elizabeth, N.J. Each of the specified station locations is within, or very near, the New York-Northeastern New Jersey urbanized area as delineated by the Bureau of the Census in the 1960 census of population.

2. Both the Hearing Examiner's Initial Decision and the Review Board's Decision would have granted Radio's application. Applications for review of the Board's Decision were filed by Jupiter and Somerset. Because this proceeding involved important policy questions similar to those in two other proceedings, by our Order (FCC 65-591), released July 9, 1965, we granted the applications for review and permitted the parties to file briefs and to present arguments before the Commission, en banc, on October 8, 1965. The briefs and arguments of the parties in this proceeding have provided valuable assistance in clarifying the standards that should be applied to determine which application would better serve the public interest when one or more of the proposed stations is to be located in a suburban community and would serve adjacent metropolitan areas.

3. Our examination of these applications reveals that Jupiter and Radio propose 5 mv/m daytime service within the geographic boundaries of at least one other community of over 50,000 persons and with a population at least twice as large as that of the applicants' specified station locations. Accordingly, we are persuaded for the reasons stated in our Policy Statement (FCC 65-1153), adopted December 22, 1965, that a determination should be made in this proceeding whether each of these two suburban proposals will realistically serve its own specified station location or some other larger community. We shall therefore revise the issues in this proceeding so that, in addition to the usual 307(b) evidence concerning the independence of a suburban community from its central city (much of which has already been adduced), the parties may fully explore all matters relating to the need for each of these proposals. Thus, each of these two applicants will be expected to show the extent to which it has ascertained that its specified station location has separate and distinct programming needs, the extent to which these needs are not being met by existing standard broadcast stations, and the extent to which its program proposals will meet those needs. Additionally, each of these two applicants will be expected to adduce evidence as to whether the projected sources of advertising revenues from within its specified station location are adequate to support its proposal as compared with its projected sources from all other areas. Since Somerset's proposal does not fall within our test, we will not enlarge the issues in this proceeding with respect to its application.

4. An applicant who fails to establish that it will realistically serve its specified station location under the programming and revenues issue will be deemed to propose to serve the most populous community whose geographic boundaries are penetrated by its 5 mv/m daytime contour, unless the evidence establishes that it will realistically serve a third community which also receives the requisite coverage.[1] Accordingly, an issue will also be added to determine whether these two applicants meet all of the technical provisions of our rules, including §§ 73.30, 73.31, and 73.188(b) (1) and (2), for a station assigned to the appropriate larger community. Finally, the burden of proof with respect to these additional issues will be upon the individual applicants in each instance.

Accordingly, It Is Ordered, This 22d day of December 1965, that this proceeding is remanded to Hearing Examiner Jay A. Kyle for further hearing and for preparation of a Supplemental Initial Decision consistent with this Memorandum Opinion and Order; and

It Is Further Ordered, That the issues in this proceeding are hereby enlarged as follows:

(a) To determine whether each of the proposals of Jupiter Associates, Inc., and Radio Elizabeth, Inc., will realistically provide a local transmission facility for its specified station location or for another larger community, in light of all of the relevant evidence, including, but not necessarily limited to, the showing with respect to:

(1) The extent to which each specified station location has been ascertained by each of the two applicants to have separate and distinct programming needs;

(2) The extent to which the needs of each specified station location are being met by existing standard broadcast stations;

(3) The extent to which each applicant's program proposal will meet the specific, unsatisfied programming needs of its specified station location; and

(4) The extent to which the projected sources of each applicant's advertising revenues within its specified station location are adequate to support its proposal, as compared with its projected sources from all other areas.

(b) To determine, in the event that it is concluded pursuant to the foregoing issue (a) that one or both of the proposals will not realistically provide a local transmission service for its specified station location, whether each such proposal meets all of the technical provisions of the rules, including §§ 73.30, 73.31 and 73.188(b) (1) and (2), for standard broadcast stations assigned to the most populous community for which it is determined that the proposal will realistically provide a local transmission service.

Released: December 27, 1965.

FEDERAL COMMUNICATIONS COMMISSION,[2]
[SEAL] BEN F. WAPLE,
Secretary.

[F.R. Doc. 65-13947; Filed, Dec. 29, 1965; 8:49 a.m.]

[Docket Nos. 14082, 14088; FCC 65-1155]

MONROEVILLE BROADCASTING CO. AND MINERS BROADCASTING SERVICE, INC. (WMBA)

Memorandum Opinion and Order Amending Issues

In re applications of Monroeville Broadcasting Co., Monroeville, Pa., Docket No. 14082, File No. BP-13840; Miners Broadcasting Service, Inc. (WMBA), Ambridge-Aliquippa, Pa., Docket No. 14088, File No. BP-13855; for construction permits.

1. This proceeding involves the mutually exclusive applications of: (a) Monroeville Broadcasting Co. (hereinafter Monroeville) for a construction permit

[1] See paragraph 11 and especially footnote 1 appended thereto of our policy statement, supra, for the effect of such service to a third community.

[2] Commissioner Cox not participating.

to operate a new class II standard broadcast station on 1510 kilocycles with 250 watts of power, daytime only, utilizing a nondirectional antenna at Monroeville, Pa.; and (b) Miners Broadcasting Service, Inc. (hereinafter WMBA), which presently operates a class III standard broadcast station, daytime only, on 1460 kilocycles, with 500 watts of power, utilizing a directional antenna at Ambridge, Pa., for a construction permit to operate a class II standard broadcast station, daytime only, on 1510 kilocycles, with 10,000 watts of power, utilizing a directional antenna, with dual-city identification at Ambridge-Aliquippa, Pa. Each of the specified station locations is within the Pittsburgh urbanized area as delineated by the Bureau of the Census in the 1960 census of population. After our decision, in which we granted Monroeville's application and denied the competing application of Miners, the U.S. Court of Appeals for the District of Columbia Circuit remanded this case for further proceedings, Miners Broadcasting Service, Inc. v. Federal Communications Commission, 349 F. 2d 199, 5 R.R. 2d 2086 (1965).

2. The decision of the Court of Appeals stated that we should establish or clarify the standards used to distinguish between two suburban applicants, both of which propose to serve some parts of their central city and urbanized area. In accordance with that opinion, by our Memorandum Opinion and Order, 1 F.C.C. 2d 319, 5 R.R. 2d 547 (1965), the parties in this proceeding were permitted to file briefs and to present arguments before the Commission, en banc, on October 8, 1965. The briefs and arguments by these parties have provided valuable assistance in clarifying the standards that should be applied to determine which application would better serve the public interest when one or more of the proposed stations is to be located in a suburban community and would serve adjacent metropolitan areas.

3. Our examination of these applications reveals that each of the applicants proposes 5 mv/m daytime service within the geographic boundaries of at least one other community of over 50,000 persons and with a population at least twice as large as that of the applicant's specified station location. Accordingly, we are persuaded for the reasons stated in our Policy Statement (FCC 65–1153), adopted December 22, 1965, that a determination should be made in this proceeding whether each of these suburban proposals will realistically serve its own specified station location or some other larger community. We shall therefore revise the issues in this proceeding so that, in addition to the usual 307(b) evidence concerning the independence of a suburban community from its central city (much of which has already been adduced), the parties may fully explore all matters relating to the need for each of these proposals. Thus, each of the applicants will be expected to show the extent to which it has ascertained that its specified station location has separate and distinct programing needs, the extent to which these needs are not being met by existing standard broadcast stations, and the extent to which its program proposals will meet these needs. Additionally, each of the applicants will be expected to adduce evidence as to whether the projected sources of advertising revenues from within its specified station location are adequate to support its proposal as compared with its projected sources from all other areas.

4. An applicant who fails to establish that it will realistically serve its specified station location under the programing and revenues issue will be deemed to propose to serve the most populous community whose geographic boundaries are penetrated by its 5 mv/m daytime contour, unless the evidence establishes that it will realistically serve a third community whose boundaries are also penetrated by its 5 mv/m daytime contour.[1] Accordingly, an issue will also be added to determine whether those applicants meet all of the technical provisions of our rules, including §§ 73.30, 73.31, and 73.188(b) (1) and (2), for a station assigned to the appropriate larger community. Finally, the burden of proof with respect to these additional issues will be upon the individual applicants in each instance.

Accordingly, it is ordered, This 22d day of December 1965, that this proceeding is remanded to Hearing Examiner Charles J. Frederick for further hearing and for preparation of a Supplemental Initial Decision consistent with this Memorandum Opinion and Order; and

It is further ordered, That the issues in this proceeding are hereby enlarged as follows:

(a) To determine whether each of the proposals will realistically provide a local transmission facility for its specified station location or for another larger community, in light of all of the relevant evidence, including, but not necessarily limited to, the showing with respect to:

(1) The extent to which each specified station location has been ascertained by each applicant to have separate and distinct programing needs;

(2) The extent to which the needs of each specified station location are being met by existing standard broadcast stations;

(3) The extent to which each applicant's program proposal will meet the specific, unsatisfied programing needs of its specified station location; and

(4) The extent to which the projected sources of each applicant's advertising revenues within its specified station location are adequate to support its proposal, as compared with his projected sources from all other areas.

(b) To determine, in the event that it is concluded pursuant to the foregoing issue (a) that one or both of the proposals will not realistically provide a local transmission service for its specified station location, whether each such proposal meets all of the technical provisions of the rules, including §§ 73.30, 73.31, and 73.188(b) (1) and (2), for standard broadcast stations assigned to the most populous community for which it is determined that the proposal will realistically provide a local transmission service.

Released: December 27, 1965.

FEDERAL COMMUNICATIONS COMMISSION,[2]
[SEAL] BEN F. WAPLE,
Secretary.

[F.R. Doc. 65–13948; Filed, Dec. 29, 1965; 8:49 a.m.]

[1] See paragraph 11 and especially footnote 1 appended thereto of our policy statement, supra, for the effect of such service to a third community.

[2] Commissioner Cox not participating.

FEDERAL MARITIME COMMISSION

[Docket No. 65–52]

JAPAN-ATLANTIC AND GULF FREIGHT CONFERENCE AND TRANS-PACIFIC FREIGHT CONFERENCE OF JAPAN

Modification of Dual Rate Contract; Order of Investigation and Hearing

The Commission has before it the application of the Japan-Atlantic and Gulf Freight Conference and the Trans-Pacific Freight Conference of Japan for permission to change certain provisions of its form of dual rate contract as approved under Dockets 1078 and 1080.

In order to determine whether the contract as changed should be approved, disapproved, or modified in accordance with the general standards of section 14(b) and the express requirements of section 14(b) (1) through (9):

It is ordered, That pursuant to sections 14(b) and 22 of the Shipping Act, 1916, as amended, an investigation and hearing be instituted to determine whether conditions in these trades are now such as to necessitate a departure from the contract language which was approved under Dockets 1078 and 1080; and, if so, as to whether the use of the contracts as modified will be detrimental to the commerce of the United States, contrary to the public interest, or unjustly discriminatory or unfair as between shippers, exporters, importers or ports or between exporters from the United States and their foreign competitors, and as to whether this contract should be approved, disapproved or modified pursuant to section 14(b) of the Shipping Act, 1916;

It is further ordered, That the Japan-Atlantic and Gulf Freight Conference, and the Trans-Pacific Freight Conference of Japan, and their member lines, listed in appendixes A and B, respectively, set forth below, be made respondents in this proceeding;

It is further ordered, That this matter be assigned for hearing before an Examiner of the Commission's Office of Hearing Examiners at a date and place to be hereafter determined and announced by the Presiding Examiner;

It is further ordered, That any persons, other than respondents, having any interest in this proceeding, shall file a petition for leave to intervene with the Secretary, Federal Maritime Commission, Washington, D.C., 20573, on or before January 13, 1966, with copy to respondents.

It is further ordered, That this order and notice of hearing be published in the FEDERAL REGISTER, that a copy of such order be served upon respondents and that all future notices, orders and decisions issued in this proceeding, including the time and place of hearing and prehearing conference, be mailed directly to each party of record.

By the Commission.

[SEAL] THOMAS LISI, *Secretary.*

APPENDIX A

JAPAN-ATLANTIC AND GULF FREIGHT CONFERENCE (3103)

American President Lines, Ltd., 29 Broadway, New York, N.Y., 10006.
Barber-Wilhelmsen Line—Joint Service, % Barber Steamship Lines, Inc., 17 Battery Place, New York, N.Y., 10004.
Japan Line, Ltd., % A. Burbank & Co., Ltd., General Agents, 120 Wall Street, New York, N.Y., 10005.
Kawasaki Kisen Kaisha, Ltd., % Kerr Steamship Co., Inc., General Agents, Clegg Building, 51 Broad Street, New York, N.Y., 10004.
Lykes Bros. Steamship Co., Inc., 821 Gravier Street, New Orleans 12, La.
Marchessini Lines—Joint Service, 26 Broadway, New York, N.Y., 10004.
Maritime Company of the Philippines, % North American Maritime Agencies, General Agents, 26 Broadway, New York, N.Y., 10004.
Moller-Maersk Line, A.P.—Joint Service, Moller Steamship Co., Inc., 67 Broad Street, New York, N.Y., 10004.
Mitsui O.S.K. Line, Ltd., 17 Battery Place, New York, N.Y., 10004.
Nippon Yusen Kaisha, Ltd., 25 Broadway, New York, N.Y., 10004.
States Marine Lines—Joint Service, % States Marine-Isthmian Agency, Inc., 90 Broad Street, New York, N.Y., 10004.
United Philippine Lines, Inc., % Stockard Shipping Co., Inc., 17 Battery Place, New York, N.Y., 10004.
United States Lines Co. (American Pioneer Line), 1 Broadway, New York, N.Y., 10004.
Yamashita-Shinnihon Steamship Co., Ltd., % Texas Transport & Terminal Co., Inc., 52 Broadway, New York, N.Y., 10004.
Blue Sea Line—Joint Service, Funch Edye & Co., Inc., 21 Broadway, New York, N.Y., 10004.
Chester Cole, Chairman, Japan-Atlantic and Gulf Freight Conference, Kindai Building, 11,3-chome, Kyobashi Chuo Ku, Tokyo, Japan.

APPENDIX B-150

TRANS-PACIFIC FREIGHT CONFERENCE OF JAPAN

American Mail Line, Ltd., 17 Battery Place, New York, N.Y., 10004.
American President Lines, Ltd., 29 Broadway, New York, N.Y., 10006.
Barber-Wilhelmsen Line—Joint Service, % Barber Steamship Lines, Inc., 17 Battery Place, New York, N.Y., 10004.
Fern-Ville Lines, % Fearnley & Eger and A. F. Klaveness & Co., A/S—Joint Service, 39 Broadway, New York, N.Y., 10006.
Japan Line, Ltd., 120 Wall Street, New York, N.Y., 10005.
Kawasaki Kisen Kaisha, Ltd., % Kerr Steamship Co., Inc., General Agents, Clegg Building, 51 Broad Street, New York, N.Y., 10004.
Knutsen Line—Joint Service, % Boyd, Weir & Sewell, Inc., 17 Battery Place, New York, N.Y., 10004.
Maritime Company of the Philippines, Inc., % North American Maritime Agencies, General Agents, 26 Broadway, New York, N.Y., 10004.
Mitusi O.S.K. Line, Ltd., 17 Battery Place, New York, N.Y., 10004.
Nippon Yusen Kaisha, Ltd., 25 Broadway, New York, N.Y., 10004.
Pacific Far East Line, Inc., 141 Battery Street, San Francisco, Calif.
States Steamship Co., 2 Broadway, New York, N.Y., 10004.
United Philippine Lines, Inc., % Stockard Shipping Co., Inc., 17 Battery Place, New York, N.Y., 10004.
United States Lines Co. (American Pioneer Line), 1 Broadway, New York, N.Y., 10004.
Waterman Steamship Corp., 19 Rector Street, New York, N.Y., 10006.
Showa Shipping Co., Ltd., % Olympic Steamship Co., General Agents, 120 Wall Street, New York, N.Y., 10005.
States Marine Lines—Joint Service, % States Marine-Isthmian Agency, Inc., 90 Broad Street, New York, N.Y., 10004.
Yamashita-Shinnihon Steamship Co., Ltd., % Texas Transport & Terminal Co., Inc., 52 Broadway, New York, N.Y., 10004.
D. P. Gillette, Chairman, Trans-Pacific Freight Conference of Japan, Kindai Building, 11,3-chome, Kyobashi Chuo Ku, Tokyo, Japan.

[F.R. Doc. 65-13934; Filed, Dec. 29, 1965; 8:48 a.m.]

FEDERAL POWER COMMISSION

[Docket No. RI66-211]

ASHLAND OIL & REFINING CO.

Order Providing for Hearing on and Suspension of Proposed Change in Rate

DECEMBER 23, 1965.

On November 26, 1965, Ashland Oil & Refining Co. (Ashland),[1] tendered for filing a proposed change in its presently effective rate schedule for sales of natural gas subject to the jurisdiction of the Commission. The proposed change, which constitutes an increased rate and charge, is contained in the following designated filing:

Description: Notice of change, dated November 22, 1965.[2]
Purchaser and producing area: Consolidated Gas Supply Corp. (Virginia Field; Buchanan, Russell, and Tazewell Counties, Va., and McDowell County, W. Va.; and Logan-Wyoming Field, Logan and Wyoming Counties, W. Va.).
Rate schedule designation: Supplement No. 20 to Ashland's FPC Gas Rate Schedule No. 113.
Effective date: December 27, 1965.[3]
Amount of annual increase: $328,800.
Pressure Base: 15.325 p.s.i.a.
Effective Rate: 27.74 cents per Mcf.[4]
Proposed Rate: 31.85 cents per Mcf.[5][6]

The contract for Ashland's sale provides for a base rate of 25.0 cents per Mcf plus an adjustment equal to one-half of any increase in average rate received by Consolidated Gas Supply Corp. (Consolidated) for all sales during the 1-year period following the effective dates of any rate increases filed by Consolidated with the Federal Power Commission or the West Virginia Public Service Commission. Ashland's proposed increase is based on four rate increases filed with this Commission by Consolidated in Docket Nos. G-5474, G-12454, G-17220, and RP61-14. A rate settlement of these proceedings was approved by the Commission's order issued December 7, 1962. The present net effect of these settled rates of Consolidated raises its overall average rate a total of 13.7 cents per Mcf.

Ashland's proposed rate of 31.85 cents per Mcf exceeds the West Virginia area ceilings of 25.0 cents per Mcf for increased rates and 28.0 cents per Mcf for initial service, which are also used as informal ceiling rates for Virginia. The latter area is not covered by the Commission's Statement of General Policy No. 61-1, as amended. Since the proposed rate of 31.85 cents per Mcf is the highest increased rate filed in West Virginia and Virginia, and exceeds the above-mentioned ceilings, we believe it should be suspended for 5 months as hereinafter ordered.

The proposed changed rate and charge may be unjust, unreasonable, unduly discriminatory, or preferential, or otherwise unlawful.

The Commission finds:

It is necessary and proper in the public interest and to aid in the enforcement of the provisions of the Natural Gas Act that the Commission enter upon a hearing concerning the lawfulness of the proposed change, and that Supplement No. 20 to Ashland's FPC Gas Rate Schedule No. 113 be suspended and the use thereof deferred as hereinafter ordered.

The Commission orders:

(A) Pursuant to the authority of the Natural Gas Act, particularly sections 4 and 15 thereof, the Commission's rules of practice and procedure, and the regulations under the Natural Gas Act (18 CFR Ch. I), a public hearing shall be held upon a date to be fixed by notice from the Secretary concerning the lawfulness of the proposed increased rate and charge

[1] Address is: Post Office Box 1503, Houston, Tex., 77001, Attention: J. Paul Fly, Esquire.
[2] Includes letter dated May 17, 1965, showing the dates of Consolidated's rate increases, and letter dated Oct. 25, 1965, in which Consolidated sets out the rate which Ashland is currently entitled to collect under the terms of its contract.
[3] The stated effective date is the effective date proposed by Respondent.
[4] June 7, 1954, rate.
[5] Revenue-sharing rate increase.
[6] Base rate of 25.0 cents per Mcf plus 50 percent of increases in rate received by Consolidated for all gas it sold during year ending Apr. 30, 1965.

contained in Supplement No. 20 to Ashland's FPC Gas Rate Schedule No. 113.

(B) Pending such hearing and decision thereon, Supplement No. 20 to Ashland's FPC Gas Rate Schedule No. 113 is hereby suspended and the use thereof deferred until May 27, 1966, and thereafter until such further time as it is made effective in the manner prescribed by the Natural Gas Act.

(C) Neither the supplement hereby suspended, nor the rate schedule sought to be altered thereby, shall be changed until this proceeding has been disposed of or until the period of suspension has expired, unless otherwise ordered by the Commission.

(D) Notices of intervention or petitions to intervene may be filed with the Federal Power Commission, Washington, D.C., 20426, in accordance with the rules of practice and procedure (18 CFR 1.8 and 1.37(f)) on or before February 9, 1966.

By the Commission.

[SEAL] JOSEPH H. GUTRIDE, *Secretary.*

[F.R. Doc. 65-13897; Filed, Dec. 29, 1965; 8:45 a.m.]

[Docket No. RI66-206 etc.]

ASSOCIATED OIL & GAS CO. ET AL.

Order Providing for Hearings on and Suspension of Proposed Changes in Rates [1]

DECEMBER 21, 1965.

Associated Oil & Gas Co. (Operator), et al., and other respondents listed herein, Docket Nos. RI66-206, et al.

The Respondents named herein have filed proposed increased rates and charges of currently effective rate schedules for sales of natural gas under Commission jurisdiction, as set forth in Appendix A below.

The proposed changed rates and charges may be unjust, unreasonable, unduly discriminatory, or preferential, or otherwise unlawful.

The Commission finds: It is in the public interest and consistent with the Natural Gas Act that the Commission enter upon hearings regarding the lawfulness of the proposed changes, and that the supplements herein be suspended and their use be deferred as ordered below.

The Commission orders: (A) Under the Natural Gas Act, particularly sections 4 and 15, the Regulations pertaining thereto (18 CFR Ch. I), and the Commission's rules of practice and procedure, public hearings shall be held concerning the lawfulness of the proposed changes.

(B) Pending hearings and decisions thereon, the rate supplements herein are suspended and their use deferred until date shown in the "Date Suspended Until" column, and thereafter until made effective as prescribed by the Natural Gas Act.

(C) Until otherwise ordered by the Commission, neither the suspended supplements, nor the rate schedules sought to be altered, shall be changed until disposition of these proceedings or expiration of the suspension period.

(D) Notices of intervention or petitions to intervene may be filed with the Federal Power Commission, Washington, D.C., 20426, in accordance with the rules of practice and procedure (18 CFR 1.8 and 1.37(f)) on or before February 10, 1966.

By the Commission.

JOSEPH H. GUTRIDE, *Secretary.*

APPENDIX A

Docket No.	Respondent	Rate schedule No.	Supplement No.	Purchaser and producing area	Amount of annual increase	Date filing tendered	Effective date unless suspended	Date suspended until—	Cents per Mcf: Rate in effect	Cents per Mcf: Proposed increased rate	Rate in effect subject to refund in docket Nos.
RI66-206	Associated Oil & Gas Co. (Operator), et al., 3703 Yoakum Blvd., Houston, Tex., 77006.	9	2	Tennessee Gas Transmission Co. (New Taiton Field, Wharton County, Tex.) (R.R. District No. 3).	$1,200	11-26-65	[2] 1-1-66	6-1-66	13.5	[3] [4] 14.5	
RI66-207	Helmerich & Payne, Inc. (Operator), et al., Utica at 21st, Tulsa, Okla., 74114.	34	3	Michigan Wisconsin Pipe Line Co. (Laverne Field, Beaver County, Okla.) (Panhandle Area).	[5] 2,657	11-24-65	[6] 12-25-65	5-25-66	[5] 17.0	[3] [5] [7] 20.43	
RI66-208	The Shamrock Oil & Gas Corp., Post Office Box 631, Amarillo, Tex., 79105.	32	4	Panhandle Eastern Pipe Line Co. (McKee Plant, Moore County, Tex.) (R.R. District No. 10).	364,500	11-29-65	[2] 1-1-66	6-1-66	[8] [10] 12.0	[3] [4] [10] 13.5	RI64-342.

[1] The stated effective date is the effective date requested by Respondent.
[2] Periodic rate increase.
[3] Pressure base is 14.65 p.s.i.a.
[4] Includes amount attributable to upward B.t.u. adjustment.
[5] Subject to upward B.t.u. adjustment based on 1/100 cent per Mcf for each additional B.t.u. per cubic foot in excess of 1,000 B.t.u. to a maximum of 1,200 B.t.u. per cubic foot.
[6] Includes base rate of 19.5 cents per Mcf plus upward B.t.u. adjustment for gas containing 1093 B.t.u.'s per cubic foot as shown in filing.
[7] Filing erroneously shows present effective rate of 17.0 cents per Mcf subject to upward B.t.u. adjustment. However, the present effective rate under the rate schedule is the permanently certificated rate, which is 17.0 cents per Mcf.
[8] Includes 1.0 cent per Mcf compression charge paid by buyer to seller.
[10] Subject to downward B.t.u. adjustment.

All of the producers' proposed increased rates and charges exceed the applicable area price levels for increased rates as set forth in the Commission's Statement of General Policy No. 61-1, as amended (18 CFR, Chapter I, Part 2, Section 2.56).

[F.R. Doc. 65-13898; Filed, Dec. 29, 1965; 8:45 a.m.]

[Docket No. CP66-190]

CITY OF CORYDON, KY., AND TEXAS GAS TRANSMISSION CORP.

Notice of Application

DECEMBER 22, 1965.

Take notice that on December 13, 1965, the City of Corydon, Ky. (Applicant), 215 First Street, Henderson, Ky., filed in Docket No. CP66-190 an application pursuant to section 7(a) of the National Gas Act for an order of the Commission directing Texas Gas Transmission Corp. (Respondent) to establish physical connection of its transportation facilities with the facilities proposed to be constructed by Applicant and to sell and deliver to Applicant volumes of natural gas for resale and distribution in Applicant, all as more fully set forth in the application which is on file with the Commission and open to public inspection.

The application states that Applicant is located approximately seven miles from Henderson, the county seat of Henderson County, Ky., and that Henderson is on the southern bank of the Ohio River approximately 8 miles south of Evansville, Ind. Applicant's present population is stated to be 800 and the county is stated to have an estimated 35,000 inhabitants.

The total estimated volumes of natural gas necessary to meet Applicant's annual and peak day requirements for the initial three year period of proposed operations are stated to be:

	First year	Second year	Third year
Annual (Mcf)	28,825	35,421	39,390
Peak day (Mcf)	369	455	512

Applicant proposes to construct and operate a natural gas distribution system consisting of approximately 38,480 feet of 4-inch steel pipe and 33,200 feet of 2-inch pipe together with appurtenant measuring and regulating facilities at a total estimated cost of $215,000, which cost will be financed through the issuance by Applicant of gas revenue bonds.

[1] Does not consolidate for hearing or dispose of the several matters herein.

Protests or petitions to intervene may be filed with the Federal Power Commission, Washington, D.C., 20426, in accordance with the rules of practice and procedure (18 CFR 1.8 or 1.10) on or before January 7, 1966.

JOSEPH H. GUTRIDE,
Secretary.

[F.R. Doc. 65-13899; Filed, Dec. 29, 1965; 8:45 a.m.]

[Docket No. RI66-209]

KERR-McGEE CORP. ET AL.

Order Providing for Hearing on and Suspension of Proposed Change in Rate, and Allowing Rate Change To Become Effective Subject to Refund

DECEMBER 21, 1965.

Respondent named herein has filed a proposed change in rate and charge of a currently effective rate schedule for the sale of natural gas under Commission jurisdiction, as set forth in Appendix A hereof.

The proposed changed rate and charge may be unjust, unreasonable, unduly discriminatory, or preferential, or otherwise unlawful.

The Commission finds: It is in the public interest and consistent with the Natural Gas Act that the Commission enter upon a hearing regarding the lawfulness of the proposed change, and that the supplement herein be suspended and its use be deferred as ordered below.

The Commission orders: (A) Under the Natural Gas Act, particularly sections 4 and 15, the regulations pertaining thereto (18 CFR ch. I), and the Commission's rules of practice and procedure, a public hearing shall be held concerning the lawfulness of the proposed change.

(B) Pending hearing and decision thereon, the rate supplement herein is suspended and its use deferred until date shown in the "Date Suspended Until" column, and thereafter until made effective as prescribed by the Natural Gas Act: *Provided, however,* That the supplement to the rate schedule filed by Respondent shall become effective subject to refund on the date and in the manner herein prescribed if within 20 days from the date of the issuance of this order Respondent shall execute and file under its above-designated docket number with the Secretary of the Commission its agreement and undertaking to comply with the refunding and reporting procedure required by the Natural Gas Act and § 154.102 of the regulations thereunder, accompanied by a certificate showing service of a copy thereof upon the purchaser under the rate schedule involved. Unless Respondent is advised to the contrary within 15 days after the filing of its agreement and undertaking, such agreement and undertaking shall be deemed to have been accepted.

(C) Until otherwise ordered by the Commission, neither the suspended supplement, nor the rate schedule sought to be altered, shall be changed until disposition of this proceeding or expiration of the suspension period.

(D) Notices of intervention or petitions to intervene may be filed with the Federal Power Commission, Washington, D.C., 20426, in accordance with the rules of practice and procedure (18 CFR 1.8 and 1.37 (f)) on or before February 10, 1966.

By the Commission.

[SEAL] JOSEPH H. GUTRIDE,
Secretary.

APPENDIX A

Docket No.	Respondent	Rate schedule No.	Supplement No.	Purchaser and producing area	Amount of annual increase	Date filing tendered	Effective date unless suspended	Date suspended until—	Cents per Mcf: Rate in effect	Cents per Mcf: Proposed increased rate	Rate in effect subject to refund in docket Nos.
RI66-209	Kerr-McGee Corp. (Operator), et al., Kerr-McGee Bldg., Oklahoma City, Okla., 73102.	[1] 78	2	Southern Natural Gas Co. (Lake La Rose Field, St. Martin Parish, La.) (South Louisiana).	$98,531	11-29-65	[2] 1-1-66	[3] 1-2-66	[4] 13.3	[5] [6] 21.25	

[1] Contract executed after Sept. 28, 1960, the date of issuance of General Policy Statement No. 61-1.
[2] The stated effective date is the effective date requested by Respondent.
[3] The suspension period is limited to 1 day.
[4] Periodic rate increase.
[5] Pressure base is 15.025 psia.
[6] Subject to a downward B.t.u. price adjustment.

Kerr-McGee Corp. (Operator), et al., (Kerr-McGee) claims that their proposed 21.25 cents per Mcf rate is in reality an initial rate and should be accepted without suspension. It is also claimed that the presently effective rate of 13.3 cents per Mcf was an interim price to hold until January 1, 1966, and that such price was agreed to because of the distress nature of this sale at the time the contract was executed on February 28, 1963. Since the contract was executed subsequent to February 28, 1960, the date of issuance of the General Policy Statement No. 61-1, as amended, and the proposed increased rate is above the applicable area ceiling for increased rates but below the initial service ceiling for the area involved, we are suspending Kerr-McGee's proposed rate increase for 1 day from January 1, 1966, the proposed effective date.

[F.R. Doc. 65-13900; Filed, Dec. 29, 1965; 8:45 a.m.]

[Docket No. E-7262]

OTTER TAIL POWER CO.

Order Providing for Hearing and Suspension of Notice of Cancellation of Filed Rate Schedules

DECEMBER 22, 1965.

This order directs a hearing to determine the lawfulness of a notice of cancellation by Otter Tail Power Co. (Otter Tail), of certain filed rate schedules of the Company pursuant to which Otter Tail provides electric service to the Minnesota Valley Cooperative Light & Power Association (Cooperative). Pending conclusion of that hearing and the Commission's decision, this order suspends the operation and effectiveness of the proffered notice of cancellation until May 23, 1966.

Otter Tail's notice of cancellation, tendered for filing with the Commission on November 22, 1965, pursuant to Part 35.15 of the Commission's Regulations under the Federal Power Act, has been designated in the files of the Commission as Supplement No. 2 to Otter Tail's Rate Schedule FPC No. 104. Rate Schedule FPC No. 104 and Supplement No. 1 thereto embody the terms and provisions of a transmission agreement between Otter Tail and Cooperative pursuant to which the Cooperative receives power as a preference customer of the Bureau of Reclamation; and they provide that Otter Tail shall furnish standby or firming services. Additionally, the agreements provide for the use by Otter Tail of certain of Cooperative's 69 kv transmission facilities used by the Company in providing electric service to the city of Madison, Minn. During the calendar year 1964, Otter Tail delivered a total of 15,303,672 kilowatt hours to the Cooperative at two delivery points, 69 kv at Madison, Minn., and 41.6 kv at Canby, Minn.

Otter Tail, incorporated under the laws of the State of Minnesota, is engaged in the generation, transmission, distribution, and sale of electric energy in the States of Minnesota, North Dakota, and South Dakota. Its principal business office is at Fergus Falls, Minn. Cooperative, incorporated under the laws of the State of Minnesota, is engaged in the transmission, distribution, and sale of electric energy in the State of Minnesota and maintains its principal place of business at Montevideo, Minn.

Otter Tail, a participant in certain interchange or wheeling arrangements with the Bureau of Reclamation, U.S. Department of the Interior, and Northern States Power Co. (Northern States), delivers power and energy to Cooperative at the aforementioned delivery points essentially for the account of Northern States Power Co. Northern States serves six other delivery points of the Cooperative as a preference customer of the Bureau of Reclamation, but is without direct connections with the Cooperative at Madison and Canby. The underly-

ing contractual arrangements between Northern States and Otter Tail for such services are reflected in the former Company's Rate Schedule FPC No. 95 as supplemented, and the latter Company's Rate Schedule FPC No. 94, as supplemented.

Otter Tail receives 2 mills per kilowatt hour from Northern States for power and energy supplied to Cooperative. Additionally, the Company receives 1½ mills per kilowatt hour delivered to Cooperative for standby or firming service to the latter.

Under Rate Schedule FPC No. 104, Otter Tail undertakes to compensate Cooperative at the rate of $7,000 annually, effective November 1, 1965, for use of the latter's facilities in providing service to the city of Madison, the first payment to be made November 1, 1966.

Information available to the Commission indicates that Cooperative will become a direct service customer of the Bureau of Reclamation at the Madison and Canby points effective June 30, 1966, upon completion of certain facilities. However, until then, those portions of Cooperative's electric system are dependent for electric supply upon service from Otter Tail.

On December 16, 1965, Otter Tail advised the Commission of its undertaking to continue service to Cooperative on a month-to-month basis, upon certain terms and conditions which apparently were not communicated to the Cooperative. By letter dated December 10, 1965, Cooperative, through its counsel, objected to Otter Tail's proposed notice of cancellation and cessation of service.

The Commission finds:

In view of the foregoing, it is necessary and appropriate for purposes of the Federal Power Act, that the Commission pursuant to authority under the Act, particularly sections 205, 206, 308, and 309 thereof, enter upon a hearing concerning the lawfulness of Otter Tail's Rate Schedule FPC No. 104 and Supplement Nos. 1 and 2 thereto; and that the operation or effectiveness of Supplement No. 2 to Otter Tail's Rate Schedule FPC No. 104 be suspended, and the use thereof deferred all as hereafter provided.

The Commission orders:

(A) A public hearing shall be held concerning the lawfulness of Otter Tail's rate schedules as referred to in the finding above; that hearing to be convened January 24, 1966, e.s.t., in a hearing room of the Federal Power Commission, 441 G Street NW., Washington, D.C.

(B) Pending such hearing and decision thereon, the operation or effectiveness under the Federal Power Act of Supplement No. 2 to Otter Tail's Rate Schedule FPC No. 104 is suspended and the use thereof deferred until May 23, 1966. On that date, the proffered rate schedule shall take effect in the manner prescribed by the Federal Power Act, unless this proceeding has been disposed of prior thereto.

(C) During the period of suspension, Otter Tail's Rate Schedule FPC No. 104 and Supplement No. 1 thereto, now on file with the Commission, shall remain and continue in effect.

(D) Unless otherwise ordered by the Commission, Otter Tail shall not change the terms and provisions of its supplemental rate schedule as referred to in paragraph (B) above or those of its rate schedule and supplement thereto on file with the Commission as referred to in paragraph (C) above, until this proceeding has been disposed of or until the period of suspension has expired.

(E) Notices of intervention or petitions to intervene may be filed with the Federal Power Commission, Washington, D.C., 20426, in accordance with the Commission's rules of practice and procedure (18 CFR 1.8 and 1.37) on or before January 13, 1966.

By the Commission.

[SEAL] JOSEPH H. GUTRIDE, *Secretary.*

[F.R. Doc. 65-13902; Filed, Dec. 29, 1965; 8:45 a.m.]

[Docket No. RI66-205]

PANO TECH EXPLORATION CORP.

Order Providing for Hearing on and Suspension of Proposed Change in Rate, and Allowing Rate Change To Become Effective Subject to Refund

DECEMBER 21, 1965.

Respondent named herein has filed a proposed change in rate and charge of a currently effective rate schedule for the sale of natural gas under Commission jurisdiction, as set forth in Appendix A hereof.

The proposed changed rate and charge may be unjust, unreasonable, unduly discriminatory, or preferential, or otherwise unlawful.

The Commission finds: It is in the public interest and consistent with the Natural Gas Act that the Commission enter upon a hearing regarding the lawfulness of the proposed change, and that the supplement herein be suspended and its use be deferred as ordered below.

The Commission orders: (A) Under the Natural Gas Act, particularly sections 4 and 15, the regulations pertaining thereto (18 CFR Ch. I), and the Commission's rules of practice and procedure, a public hearing shall be held concerning the lawfulness of the proposed change.

(B) Pending hearing and decision thereon, the rate supplement herein is suspended and its use deferred until date shown in the "Date Suspended Until" column, and thereafter until made effective as prescribed by the Natural Gas Act: *Provided, however,* That the supplement to the rate schedule filed by Respondent shall become effective subject to refund on the date and in the manner herein prescribed if within 20 days from the date of the issuance of this order Respondent shall execute and file under its above-designated docket number with the Secretary of the Commission its agreement and undertaking to comply with the refunding and reporting procedure required by the Natural Gas Act and section 154.102 of the regulations thereunder, accompanied by a certificate showing service of a copy thereof upon the purchaser under the rate schedule involved. Unless Respondent is advised to the contrary within 15 days after the filing of its agreement and undertaking, such agreement and undertaking shall be deemed to have been accepted.

(C) Until otherwise ordered by the Commission, neither the suspended supplement, nor the rate schedule sought to be altered, shall be changed until disposition of this proceeding or expiration of the suspension period.

(D) Notices of intervention or petitions to intervene may be filed with the Federal Power Commission, Washington, D.C., 20426, in accordance with the rules of practice and procedure (18 CFR 1.8 and 1.37(f)) on or before February 10, 1966.

By the Commission.

[SEAL] JOSEPH H. GUTRIDE, *Secretary.*

APPENDIX A

Docket No.	Respondent	Rate schedule No.	Supplement No.	Purchaser and producing area	Amount of annual increase	Date filing tendered	Effective date unless suspended	Date suspended until—	Cents per Mcf: Rate in effect	Cents per Mcf: Proposed increased rate	Rate in effect subject to refund in docket Nos.
RI66-205	Pano Tech Exploration Corp., 906 C & I Bldg., Houston, Tex.	[1] 1	1	Southern Natural Gas Co. (La Rose Area, St. Martin Parish, La.) (South Louisiana).	$286,200	11-22-65	[2] 1-1-66	[3] 1-2-66	13.3	[4] [5] 21.25	

[1] Contract dated after Sept. 28, 1960, the date of issuance of General Policy Statement No. 61-1.
[2] The stated effective date is the effective date requested by Respondent.
[3] The suspension period is limited to 1 day.
[4] Periodic rate increase.
[5] Pressure base is 15.025 p.s.i.a.

Pano Tech Exploration Corp. (Pano Tech) claims that its proposed rate increase, while technically a "stated periodic increase", is in reality an "initial rate". It claims Southern Natural Gas Co. was oversupplied and in a "take-or-pay" situation at the date of the contract (February 21, 1963) and did not need Pano Tech's gas, but to accommodate Pano Tech, Southern Natural Gas Co. agreed to take for the interim period (date of initial delivery on July 5, 1963 to January 1, 1966) this gas at a distress price of 13.3 cents per Mcf. Since the contract was executed subsequent to September 28, 1960, the date of issuance of the General Policy Statement No. 61-1, as amended, and the proposed increased rate is above the applicable area ceiling for increased rates but below the initial service ceiling for the area involved, we are suspending Pano Tech's proposed rate increase for one day from January 1, 1966, the proposed effective date.

[F.R. Doc. 65-13903; Filed, Dec. 29, 1965; 8:45 a.m.]

[Docket No. RI66-210]

SHELL OIL CO.

Order Providing for Hearing on and Suspension of Proposed Change in Rate, and Allowing Rate Change To Become Effective Subject to Refund

DECEMBER 21, 1965.

Respondent named herein has filed a proposed change in rate and charge of a currently effective rate schedule for the sale of natural gas under Commission jurisdiction, as set forth in Appendix A hereof.

The proposed changed rate and charge may be unjust, unreasonable, unduly discriminatory, or preferential, or otherwise unlawful.

The Commission finds: It is in the public interest and consistent with the Natural Gas Act that the Commission enter upon a hearing regarding the lawfulness of the proposed change, and that the supplement herein be suspended and its use be deferred as ordered below.

The Commission orders: (A) Under the Natural Gas Act, particularly sections 4 and 15, the regulations pertaining thereto (18 CFR Ch. I), and the Commission's rules of practice and procedure, a public hearing shall be held concerning the lawfulness of the proposed change.

(B) Pending hearing and decision thereon, the rate supplement herein is suspended and its use deferred until date shown in the "Date Suspended Until" column, and thereafter until made effective as prescribed by the Natural Gas Act: *Provided, however,* That the supplement to the rate schedule filed by Respondent shall become effective subject to refund on the date and in the manner herein prescribed if within 20 days from the date of the issuance of this order Respondent shall execute and file under its above-designated docket number with the Secretary of the Commission its agreement and undertaking to comply with the refunding and reporting procedure required by the Natural Gas Act and section 154.102 of the regulations thereunder, accompanied by a certificate showing service of a copy thereof upon the purchaser under the rate schedule involved. Unless Respondent is advised to the contrary within 15 days after the filing of its agreement and undertaking, such agreement and undertaking shall be deemed to have been accepted.

(C) Until otherwise ordered by the Commission, neither the suspended supplement, nor the rate schedule sought to be altered, shall be changed until disposition of this proceeding or expiration of the suspension period.

(D) Notices of intervention or petitions to intervene may be filed with the Federal Power Commission, Washington, D.C., 20426, in accordance with the rules of practice and procedure (18 CFR 1.8 and 1.37(f)) on or before February 10, 1966.

By the Commission.

[SEAL] JOSEPH H. GUTRIDE, *Secretary.*

APPENDIX A

Docket No.	Respondent	Rate schedule No.	Supplement No.	Purchaser and producing area	Amount of annual increase	Date filing tendered	Effective date unless suspended	Date suspended until—	Cents per Mcf: Rate in effect	Cents per Mcf: Proposed increased rate	Rate in effect subject to refund in docket Nos.
RI66-210	Shell Oil Co., 50 West 50th St., New York, N.Y., 10020, Attn.: Mr. F. C. Sweat.	319	2	El Paso Natural Gas Co. (Brown-Bassett Field, Crockett County, Tex.) (R.R. District No. 7-C) (Permian Basin Area).	$2,190	11-30-65	[1] 1-1-66	[2] 1-2-66	[3] [4] 16.0	[3] [4] 16.5	

[1] Contractually provided effective date.
[2] The suspension period is limited to 1 day.
[3] "Fractured" rate increase.
[4] Pressure base is 14.65 p.s.i.a.
[5] Less processing cost of 3.3 cents per Mcf for gas remaining after processing for removal of carbon dioxide diluent (processing cost shall not exceed 4.5 cents per Mcf in any event).
[6] Initial rate.

Shell Oil Co. (Shell) a producer-respondent in the Permian Basin Opinion No. 468, proposes a "fractured" rate increase from 16.0 cents to 16.5 cents per Mcf, amounting to $2,190 annually, for a sale of gas-well gas to El Paso Natural Gas Co. in the Permian Basin Area of Texas. Payment is based upon residue volumes remaining after processing and the proposed rate is equal to the applicable ceiling prescribed by Commission Opinion No. 468.

The contract covering the subject sale contains quality standards which do not conform to the standards prescribed in Opinion No. 468, as amended. The contract provides for a maximum diluent content (nitrogen, hydrogen sulphide, organic sulphur, and carbon dioxide) not in excess of 60 percent by volume. The principal impurity is carbon dioxide and the contract provides for a maximum deduction of 4.5 cents per Mcf from the contract rate for removal of the diluent content. The producer indicates in its rate increase filing that the processing cost for the removal of the CO_2 is 3.3 cents per Mcf. As for delivery pressure, the contract provides for delivery at the natural well flowing pressure, with the buyer having the right to operate its gathering system at pressures not to exceed 1000 p.s.i.g. Opinion No. 468, as modified by Opinion No. 468-A, prescribes a minimum delivery pressure of 500 p.s.i.g. The contract contains no B.t.u. adjustment provisions.

Although Shell's increased rate of 16.5 cents per Mcf is equal to the area base rate prescribed in Opinion Nos. 468 and 468-A, it may require adjustment for less than pipeline quality gas. Under the circumstances, we believe that Shell's proposed increase from 16.0 cents to 16.5 cents per Mcf should be suspended for 1 day from January 1, 1966, the proposed effective date.

Shell shall file with the Commission as a condition of this order within 60 days of the date of issuance of this order a statement setting forth either that the residue gas sold under the subject rate schedule accords with all pipeline quality standards established in Opinion Nos. 468 and 468-A, or in which respects the residue gas deviates from such standards; the agreed cost to the purchaser to bring it to the pipeline quality standards established there with respect to each quality deviation; any upward or downward B.t.u. adjustment; and the resulting applicable area rate for the gas. Such statement shall be signed by both the seller and the purchaser. If the seller and the purchaser are unable to agree upon any or all of the particulars entering into the computation of the applicable area rate, the seller shall file the statement herein required which shall indicate the absence of agreement and supply the information required to compute the applicable area rate as well as the contentions of the parties with respect to the quality and amount of the adjustment for any item in dispute. The purchaser may file a separate statement setting forth its views within the period herein provided.

[F.R. Doc. 65-13904; Filed, Dec. 29, 1965; 8:46 a.m.]

[Docket No. RI66-196]

SOUTHDOWN, INC.

Order Permitting Rate Filing, Providing for Hearing on and Suspension of Proposed Change in Rate

DECEMBER 21, 1965.

On October 18, 1965,[1] Southdown, Inc. (Southdown)[2] tendered for filing a proposed change in its presently effective

[1] Filing completed Nov. 10, 1965.
[2] Address is Post Office Box 52378, New Orleans, La.

rate schedule for sales of natural gas subject to the jurisdiction of the Commission. The proposed change, which constitutes an increased rate and charge, is contained in the following designated filing:

Description: Notice of change, dated October 14, 1965.[2]
Purchaser and producing area: United Gas Pipe Line Co. (Hollywood Field, Terrebonne Parish, La.) (South Louisiana).
Rate schedule designation: Supplement No. 5 to Southdown's FPC Gas Rate Schedule No. 1.
Effective date: January 1, 1966.[4]
Amount of annual increase: $3,300.
Effective rate: 21.25 cents per Mcf.[5][6]
Proposed rate: 22.8917 cents per Mcf.[5][7]
Pressure base: 15.025 p.s.i.a.

Southdown has submitted a notice of change in rate proposing an increase from 21.25 cents to 22.8917 cents per Mcf, for gas sold under its FPC Gas Rate Schedule No. 1 to United Gas Pipe Line Co. from the Hollywood Field, Terrebonne Parish, South Louisiana. The proposed 1.6417 cents per Mcf increase, amounting to $3,300 annually, is from a conditioned initial rate, being the initial service ceiling for the area, to a redetermined rate which was attained by averaging the highest prices paid by three different purchasers for gas for resale in interstate commerce, other than United, for gas produced from the area specified in the contract involved.[8]

The proposed rate of 22.8917 cents per Mcf exceeds the area increased ceiling level of 14.0 cents per Mcf as set forth in the Commission's Statement of General Policy No. 61–1, as amended, and should be suspended as hereinafter ordered.

The proposed changed rate and charge may be just, unreasonable, unduly discriminatory, or preferential, or otherwise unlawful.

The Commission finds:

It is necessary and proper in the public interest and to aid in the enforcement of the provisions of the Natural Gas Act that the Commission enter upon a hearing concerning the lawfulness of the proposed change, and that Supplement No. 5 to Southdown's FPC Gas Rate Schedule No. 1 be suspended and the use thereof deferred as hereinafter ordered.

The Commission orders:

(A) Pursuant to the authority of the Natural Gas Act, particularly sections 4 and 15 thereof, the Commission's rules of practice and procedure, and the regulations under the Natural Gas Act (18 CFR Ch. 1) a public hearing shall be held upon a date to be fixed by notice from the Secretary concerning the lawfulness of the proposed increased rate and charge contained in supplement No. 5 to Southdown's FPC Gas Rate Schedule No. 1.

(B) Pending such hearing and decision thereon, Supplement No. 5 to Southdown's FPC Gas Rate Schedule No. 1 is hereby suspended and the use thereof deferred until June 1, 1966, and thereafter until such further time as it is made effective in the manner prescribed by the natural Gas Act.

(C) Neither the supplement hereby suspended, nor the rate schedule sought to be altered thereby, shall be changed until this proceeding has been disposed of or until the period of suspension has expired, unless otherwise ordered by the Commission.

(D) Notices of intervention or petitions to intervene may be filed with the Federal Power Commission, Washington, D.C., 20426, in accordance with the rules of practice and procedure (18 CFR 1.8 and 1.37 (f)) on or before February 10, 1966.

By the Commission.

[SEAL] JOSEPH H. GUTRIDE, *Secretary.*

[F.R. Doc. 65–13905; Filed, Dec. 29, 1965; 8:46 a.m.]

[2] Includes Letter Agreement dated Sept. 7, 1965, providing for the redetermined rate for 5-year period commencing Jan. 1, 1966.
[4] The stated effective date is the effective date proposed by Respondent.
[5] Includes 1.75 cents per Mcf tax reimbursement.
[6] Conditioned initial rate provided in the temporary certificate issued in Docket No. CI62–551 in lieu of contractually provided initial price of 22.25 cents per Mcf.
[7] Redetermined rate increase.
[8] The prices utilized are not in issue in suspension or certificate proceedings.

[Docket No. CP66–192]

TRUNKLINE GAS CO.

Notice of Application

DECEMBER 22, 1965.

Take notice that on December 15, 1965, Trunkline Gas Co. (Applicant), Post Office Box 1642, Houston, Tex., 77001, filed in Docket No. CP66–192 a "budget-type" application pursuant to section 7 (c) of the Natural Gas Act, as implemented by § 157.7(b) of the regulations under the Act, for a certificate of public convenience and necessity authorizing the construction and operation of certain natural gas facilities, all as more fully set forth in the application which is on file with the Commission and open to public inspection.

Applicant seeks authorization to construct during the calendar year 1966 and operate miscellaneous field facilities including field compressors, dehydration units, meter and regulator equipment and gathering lines to facilitate the taking by Applicant of natural gas into its certificated main pipeline system which is or may become available from time to time in the general area of its system or which is or may become available due to expansion, development or production of existing sources of supply during the calendar year 1966.

Total estimated cost of Applicant's proposed construction is not to exceed $2,500,000, with no single project expenditure to exceed $500,000, which cost will be financed with current working funds.

Protests or petitions to intervene may be filed with the Federal Power Commission, Washington, D.C., 20426, in accordance with the rules of practice and procedure (18 CFR 1.8 or 1.10) and the regulations under the Natural Gas Act (157.10) on or before January 12, 1966.

Take further notice that, pursuant to the authority contained in and subject to the jurisdiction conferred upon the Federal Power Commission by sections 7 and 15 of the Natural Gas Act and the Commission's rules of practice and procedure, a hearing will be held without further notice before the Commission on this application if no protest or petition to intervene is filed within the time required herein, if the Commission on its own review of the matter finds that a grant of the certificate is required by the public convenience and necessity. If a protest or petition for leave to intervene is timely filed, or if the Commission on its own motion believes that a formal hearing is required, further notice of such hearing will be duly given.

Under the procedure herein provided for, unless otherwise advised, it will be unnecessary for Applicant to appear or be represented at the hearing.

JOSEPH H. GUTRIDE, *Secretary.*

[F.R. Doc. 65–13906; Filed, Dec. 29, 1965; 8:46 a.m.]

[Docket No. CP66–193]

UNION GAS SYSTEM, INC., AND CITIES SERVICE GAS CO.

Notice of Application

DECEMBER 23, 1965.

Take notice that on December 16, 1965, Union Gas System, Inc. (Applicant), P.O. Box 347, Independence, Kans., 67301, filed in Docket No. CP66–193 an application pursuant to section 7(a) of the Natural Gas Act for an order of the Commission directing Cities Service Gas Co. (Respondent) to establish physical connection of its transportation facilities with the facilities proposed to be constructed by Applicant and to sell and deliver to Applicant volumes of natural gas for resale and distribution in the Smith-North Area, Leavenworth County, Kans., all as more fully set forth in the application which is on file with the Commission and open to public inspection.

By the instant application, Applicant seeks the sale and delivery by Respondent to Applicant of up to 64 Mcf of natural gas per day at an interconnection of Applicant's proposed lateral pipeline with Respondent's 26-inch transmission line in eastern Leavenworth County, Kans. Specifically, Applicant proposes to construct, own, and operate a natural gas distribution system in the community known as the Smith-North Area in Leavenworth County, Kans. Applicant also proposes to construct, own, and operate pipeline facilities consisting of 1.66 miles of 2-inch I.D. pipeline and 0.40 mile of 1¼-inch I.D. pipeline extending south and east from the proposed point of interconnection. The community proposed to be served has an estimated population of approximately 65 with 20 residences and 1 public school.

The total estimated volumes of natural gas necessary to meet Applicant's annual and peak day requirements for the initial

3-year period of proposed operations are stated to be:

	First year	Second year	Third year
Annual (Mcf)	4,538	5,206	5,540
Peak day (Mcf)	51	60	64

Total estimated cost of Applicant's proposed distribution system and lateral pipeline facilities is $14,690, which cost will be financed from funds on hand.

Protests or petitions to intervene may be filed with the Federal Power Commission, Washington, D.C., 20426, in accordance with the rules of practice and procedure (18 CFR 1.8 or 1.10) on or before January 18, 1966.

JOSEPH H. GUTRIDE,
Secretary.

[F.R. Doc. 65-13907; Filed, Dec. 29, 1965; 8:46 a.m.]

[Docket No. CP66-191]

UNITED GAS PIPE LINE CO.

Notice of Application

DECEMBER 21, 1965.

Take notice that on December 13, 1965, United Gas Pipe Line Co. (Applicant), Post Office Box 1407, Shreveport, La., 71102, filed in Docket No. CP66-191 an application pursuant to sections 7(b) and 7(c) of the Natural Gas Act for permission and approval to abandon certain natural gas transportation service now being rendered to Tennessee Gas Transmission Co. (Tennessee) and for a certificate of public convenience and necessity authorizing the construction and operation of certain natural gas facilities, all as more fully set forth in the application which is on file with the Commission and open to public inspection.

The application states that the transportation service provided by Applicant for Tennessee between the Carthage Field, Panola County, Tex., and West Monroe, La., was commenced on January 22, 1946, and that by letter dated January 20, 1965, Tennessee has advised Applicant that it does not elect to extend the term of the existing transportation agreement between the parties dated January 15, 1945, but would allow same to expire on January 22, 1966, by its own terms.

The facilities and service involved in the instant application were authorized by orders of the Commission issued on July 5, 1945, in Docket No. G-622 (as modified and amended on November 9, 1945, and June 23, 1948), and December 22, 1949, in Docket No. G-1252, 4 FPC 307 and 8 FPC 584, respectively.

Applicant proposes, after the termination of the aforementioned transportation agreement, to utilize its 20-inch Carthage-Longview and 18-inch Champlin Oil & Refining Co. lines by the operation of tie-over facilities between said lines. Specifically, Applicant proposes to construct a tie-over line 20 feet long and 10 inches in diameter with appurtenant facilities from the 20-inch Carthage-Longview line to the 18-inch Champlin Oil & Refining Co. line located in Panola County, Tex.

Total estimated cost of Applicant's proposed construction is $5,668, which cost will be financed from current working funds.

Protests or petitions to intervene may be filed with the Federal Power Commission, Washington, D.C., 20426, in accordance with the rules of practice and procedure (18 CFR 1.8 or 1.10) and the regulations under the Natural Gas Act (157.10) on or before January 10, 1966.

Take further notice that, pursuant to the authority contained in and subject to the jurisdiction conferred upon the Federal Power Commission by sections 7 and 15 of the Natural Gas Act and the Commission's rules of practice and procedure, a hearing will be held without further notice before the Commission on this application if no protest or petition to intervene is filed within the time required herein, if the Commission on its own review of the matter finds that a grant of the certificate and permission and approval for the proposed abandonment are required by the public convenience and necessity. If a protest or petition for leave to intervene is timely filed, or if the Commission on its own motion believes that a formal hearing is required, further notice of such hearing will be duly given.

Under the procedure herein provided for, unless otherwise advised, it will be unnecessary for Applicant to appear or be represented at the hearing.

JOSEPH H. GUTRIDE,
Secretary.

[F.R. Doc. 65-13908; Filed, Dec. 29, 1965; 8:46 a.m.]

NATURAL GAS ADVISORY COUNCIL

Determination for Continued Existence

DECEMBER 21, 1965.

Pursuant to paragraph 9 of the Commission's Order establishing the Natural Gas Advisory Council, issued February 8, 1962, the Commission hereby determines that the continued existence of the Natural Gas Advisory Council for an additional period of 2 years is in the public interest.

By the Commission.

[SEAL] JOSEPH H. GUTRIDE,
Secretary.

[F.R. Doc. 65-13901; Filed, Dec. 29, 1965; 8:45 a.m.]

FEDERAL RESERVE SYSTEM

FIDELITY BANK

Order Approving Merger of Banks

In the matter of the application of Fidelity Bank for approval of merger with South Bay Bank.

There has come before the Board of Governors, pursuant to the Bank Merger Act of 1960 (12 U.S.C. 1828(c)), an application by Fidelity Bank, Beverly Hills, Calif., a State member bank of the Federal Reserve System, for the Board's prior approval of the merger of that bank and South Bay Bank, Manhattan Beach, Calif., under the charter and title of the former. As an incident to the merger, the sole office of South Bay Bank would become a branch of the resulting bank. Notice of the proposed merger, in form approved by the Board, has been published pursuant to said Act.

Upon consideration of all relevant material in the light of the factors set forth in said Act, including reports furnished by the Comptroller of the Currency, the Federal Deposit Insurance Corporation, and the Attorney General on the competitive factors involved in the proposed merger,

It is hereby ordered, For the reasons set forth in the Board's Statement[1] of this date, that said application be and hereby is approved.

It is further ordered, That the said merger may be consummated at any time within, but not later than, 3 months after the date of this order, the Board having determined, pursuant to its rules of procedure (12 CFR 262.2(f)(5)), that the public interest would be served by waiver of the requirement that the transaction not be consummated with 7 calendar days after the date of this order.

Dated at Washington, D.C., this 22d day of December 1965.

By order of the Board of Governors.[2]

[SEAL] MERRITT SHERMAN,
Secretary.

[F.R. Doc. 65-13912; Filed, Dec. 29, 1965; 8:46 a.m.]

OTTO BREMER CO.

Notice of Request for Determination and Order for Hearing

Notice is hereby given that request has been made to the Board of Governors of the Federal Reserve System, pursuant to section 4(c)(6) of the Bank Holding Company Act of 1956 (12 U.S.C. 1843(c)(6)) and § 222.5(b) of the Board's Regulation Y (12 CFR 222.5(b)), by The Otto Bremer Co., St. Paul, Minn., a bank holding company, for a determination that the activities planned to be undertaken by its proposed subsidiaries, The Farmers Agricultural Credit Co., Inc., The Farmers Insurance Agency, Inc., American Insurance Agency, Inc., and The International State Agency, are of the kind described in the aforementioned sections of the Act and the Regulation so as to make it unnecessary

[1] Filed as part of the original document. Copies available upon request to the Board of Governors of the Federal Reserve System, Washington, D.C., 20551, or to the Federal Reserve Bank of San Francisco.

[2] Voting for this action: Vice Chairman Balderston, and Governors Robertson, Shepardson, Mitchell, Daane, and Maisel. Absent and not voting: Chairman Martin.

for the prohibitions of section 4 of the Act with respect to shares in nonbanking organizations to apply in order to carry out the purposes of the Act.

Inasmuch as section 4(c)(6) of the Act requires that any determination pursuant thereto be made by the Board after due notice and hearing and on the basis of the record made at such hearing.

It is hereby ordered, That pursuant to section 4(c)(6) of the Bank Holding Company Act and in accordance with §§ 222.5(b) and 222.7(a) of the Board's Regulation Y (12 CFR 222.5(b), 222.7(a)), promulgated under the Bank Holding Company Act, a hearing with respect to this matter be held commencing on January 20, 1966, at 10 a.m. at the offices of the Federal Reserve Bank of Minneapolis, Minneapolis, Minn., before a hearing examiner selected by the Civil Service Commission, pursuant to section 11 of the Administrative Procedure Act, such hearing to be conducted according to the rules of practice for formal hearings of the Board of Governors of the Federal Reserve System (12 CFR Part 263). The right is reserved to the Board or such hearing examiner to designate any other date or place for such hearing or any part thereof which may be determined to be necessary or appropriate for the convenience of the parties. The Board's rules of practice for formal hearings provide, in part, that "All such hearings shall be private and shall be attended only by parties and their representatives or counsel, representatives of the Board, witnesses, and other persons having an official interest in the proceedings: *Provided, however*, That, on written request by a party or representatives of the Board, or on the Board's own motion, the Board, unless prohibited by law, may permit other persons to attend or may order the hearing to be public."

Any person desiring to give testimony in this proceeding should file with the Secretary of the Board, directly or through the Federal Reserve Bank of Minneapolis, on or before January 14, 1966, a written request containing a statement of the nature of the petitioner's interest in the proceeding, and a summary of the matters concerning which said petitioner wishes to give testimony. Such request will be presented to the designated hearing examiner for his determination. Persons submitting timely request will be notified of the hearing examiner's decision.

Dated at Washington, D.C., this 22d day of December 1965.

By order of the Board of Governors.

[SEAL] MERRITT SHERMAN, *Secretary.*

[F.R. Doc. 65-13913; Filed, Dec. 29, 1965; 8:46 a.m.]

VIRGINIA COMMONWEALTH CORP.

Order Approving Application Under Bank Holding Company Act

In the matter of the application of Virginia Commonwealth Corp., Richmond, Va., for approval of the acquisition of voting shares of the Peoples Bank of Stafford, Falmouth, Va.

There has come before the Board of Governors, pursuant to section 3(a)(2) of the Bank Holding Company Act of 1956 (12 U.S.C. 1842(a)(2)) and § 222.4(a)(2) of Federal Reserve Regulation Y (12 CFR 222.4(a)(2)), an application by Virginia Commonwealth Corp., Richmond, Va., a registered bank holding company, for the Board's prior approval of the acquisition of more than 80 percent of the outstanding voting shares of the Peoples Bank of Stafford, Falmouth, Va.

As required by section 3(b) of the Act, notice of receipt of the application was given to, and views and recommendation requested of, the Commissioner of Banking of the Commonwealth of Virginia. The Commissioner expressed no objection to approval of the application.

Notice of receipt of the application was published in the FEDERAL REGISTER on July 7, 1965 (30 F.R. 8599), providing an opportunity for interested persons to submit comments and views with respect to the proposed acquisition. The time for filing such comments and views has expired, and all those received have been considered by the Board.

It is hereby ordered, For the reasons set forth in the Board's Statement[1] of this date, that said application be and hereby is approved, provided that the acquisition so approved shall not be consummated (a) within 7 calendar days after the date of this order or (b) later than 3 months after said date.

Dated at Washington, D.C., this 22d day of December 1965.

By order of the Board of Governors.[2]

[SEAL] MERRITT SHERMAN, *Secretary.*

[F.R. Doc. 65-13914; Filed, Dec. 29, 1965; 8:46 a.m.]

SECURITIES AND EXCHANGE COMMISSION

[812-1860]

EATON & HOWARD BALANCED FUND

Filing of Application for Order Exempting Sale by Open-End Company of Its Shares

DECEMBER 23, 1965.

Notice is hereby given that Eaton & Howard Balanced Fund ("applicant"), 24 Federal Street, Boston, Mass., 02110, which is registered under the Investment Company Act of 1940 ("Act") as an open-end diversified investment company, has filed an application pursuant to section 6(c) of the Act for an order of the Commission exempting from the provisions of section 22(d) of the Act the proposed issuance of its shares at net asset value to Algonquin Investment Co. ("Algonquin") in exchange for substantially all of the assets of Algonquin. An exemptive order is requested since the proposed sale of applicant's shares is to be made at a price other than at the public offering price, which normally includes a sales charge in addition to the net asset value which applicant receives from the principal underwriter through whom such public offering is made. All interested persons are referred to the application on file with the Commission for a statement of the representations therein which are summarized below.

Algonquin, a corporation organized under the laws of Missouri, is a personal holding company whose shares are owned by two individuals and two trusts. Pursuant to an Agreement and Plan of Reorganization, applicant will acquire substantially all of the assets of Algonquin in exchange for stock of applicant which will thereafter be distributed to shareholders of Algonquin in liquidation. Neither Algonquin nor any of the shareholders thereof has any present intention of redeeming the shares of applicant which they will acquire.

The application and the exhibits annexed thereto indicate that the number of shares of applicant's stock to be delivered to Algonquin will be determined by dividing the net asset value per share of applicant into the aggregate value of the net assets of Algonquin, as adjusted. The proposed adjustment, which is described in the application, is designed to compensate applicant for potential federal income taxes which would become payable upon realization of the appreciation in the value of the securities of Algonquin to the extent that any such appreciation may proportionately exceed the appreciation in the value of the securities of applicant.

As of September 30, 1965, the net assets of applicant amounted to $228,177,893, of which $96,824,194 or 42.4 percent represented unrealized appreciation, and the net assets of Algonquin amounted to $4,618,294, of which $2,061,447 or 44.6 percent represented unrealized appreciation. Applicant presently intends to sell, subsequent to acquisition, approximately 10 percent of the assets of Algonquin to be acquired. Applicant's per share asset value as of September 30, 1965, was equal to $13.27 and if the exchange had been consummated that day, 347,824 shares would have been delivered to Algonquin after the adjustment in the valuation of Algonquin's net assets.

Notice is further given that any interested person may, not later than January 12, 1966, at 5:30 p.m., submit to the Commission in writing a request for a hearing on the matter accompanied by a statement as to the nature of his interest, the reason for such request and the issues of fact or law proposed to be controverted, or he may request that he be notified if the Commission shall order a hearing thereon. Any such communication should be addressed: Secretary,

[1] Filed as part of the original document. Copies available upon request to the Board of Governors of the Federal Reserve System, Washington, D.C., 20551, or to the Federal Reserve Bank of Richmond.

[2] Voting for this action: Unanimous, with all members present.

Securities and Exchange Commission, Washington, D.C., 20549. A copy of such request shall be served personally or by mail (airmail if the person being served is located more than 500 miles from the point of mailing) upon applicant at the address stated above. Proof of such service (by affidavit or in case of an attorney at law by certificate) shall be filed contemporaneously with the request. At any time after said date, as provided by Rule 0-5 of the rules and regulations promulgated under the Act, an order disposing of the application herein may be issued by the Commission upon the basis of the information stated in said application, unless an order for hearing upon said application shall be issued upon request or upon the Commission's own motion.

For the Commission (pursuant to delegated authority).

[SEAL] NELLYE A. THORSEN, *Assistant Secretary.*

[F.R. Doc. 65-13926; Filed, Dec. 29, 1965; 8:47 a.m.]

DEPARTMENT OF LABOR

Wage and Hour Division

CERTIFICATES AUTHORIZING EMPLOYMENT OF LEARNERS AT SPECIAL MINIMUM RATES

Notice is hereby given that pursuant to section 14 of the Fair Labor Standards Act of 1938 (52 Stat. 1060, as amended, 29 U.S.C. 201 et seq.), and Administrative Order 579 (28 F.R. 11524) the firms listed in this notice have been issued special certificates authorizing the employment of learners at hourly wage rates lower than the minimum wage rates otherwise applicable under section 6 of the act. The effective and expiration dates, occupations, wage rates, number or proportion of learners and learning periods, for certificates issued under general learner regulations (29 CFR 522.1 to 522.9), and the principal product manufactured by the employer are as indicated below. Conditions provided in certificates issued under the supplemental industry regulations cited in the captions below are as established in those regulations.

Apparel Industry Learner Regulations (29 CFR 522.1 to 522.9, as amended, and 29 CFR 522.20 to 522.25, as amended).

The following learner certificates were issued authorizing the employment of 10 percent of the total number of factory production workers for normal labor turnover purposes. The effective and expiration dates are indicated.

Alabama Textile Products Corp., Andalusia, Ala.; effective 12-1-65 to 11-30-66 (men's dress shirts and work pants).

Alabama Textile Products Corp., Troy, Ala.; effective 12-1-65 to 11-30-66 (men's dress shirts).

The Andala Co., Andalusia, Ala.; effective 12-1-65 to 11-30-66 (men's work shirts and work pants).

Bestform Foundations of Windber, Inc., Stockholm Avenue, Windber, Pa.; effective 12-9-65 to 12-8-66 (brassieres and girdles).

Byrds Manufacturing Corp., Albany, Ky.; effective 11-29-65 to 11-28-66 (ladies' shirts).

Byrds Manufacturing Corp., Byrdstown, Tenn.; effective 11-29-65 to 11-28-66 (ladies' shirts).

Cowden-Lancaster Co., 112 Hamilton Avenue, Lancaster, Ky.; effective 11-28-65 to 11-27-66 (overalls and dungarees).

Duti-Duds, Inc., 300 Monticello Avenue, Lynchburg, Va.; effective 12-2-65 to 12-1-66 (women's cotton uniforms).

Frisco Sportswear Co., Inc., Frisco City, Ala.; effective 12-4-65 to 12-3-66 (ladies' woven slacks).

Garan, Inc., Corinth Division, Corinth, Miss.; effective 11-26-65 to 11-25-66 (boys' sport shirts).

Gattman Sportswear, Inc., Gattman, Miss.; effective 12-8-65 to 12-7-66 (men's dress slacks).

Glen of Michigan, Division of Glen Manufacturing, Inc., 77 Hancock Street, Manistee, Mich.; effective 12-6-65 to 12-5-66; Learners may not be employed at special minimum wage rates in the production of skirts (misses' dresses and blouses).

Hartsville Manufacturing Co., Inc., Hartsville, S.C.; effective 11-26-65 to 11-25-66 (ladies' dresses).

Hercules Trouser Co., Hillsboro, Ohio; effective 12-1-65 to 11-30-66 (men's and boys' pants).

Hercules Trouser Co., Manchester, Ohio; effective 12-1-65 to 11-30-66 (men's and boys' pants).

Lamar Manufacturing Co., Millport, Ala.; effective 11-23-65 to 11-22-66 (men's and boys' pants).

Lismore Manufacturing Corp., 460 Globe Street, Fall River, Mass.; effective 12-1-65 to 11-30-66 (women's and children's underwear (woven)).

The Manhattan Shirt Co., 461 West Cherry Street, Jesup, Ga.; effective 12-3-65 to 12-2-66 (men's sport shirts).

McAdoo Manufacturing Co., Inc., South Hancock Street, McAdoo, Pa.; effective 12-6-65 to 12-5-66 (children's polo shirts).

Phillips-Van Heusen Corp., Brinkley, Ark.; effective 12-2-65 to 12-1-66 (men's dress shirts).

Pittston Apparel Co., East and Tompkins Streets, Pittston, Pa.; effective 12-8-65 to 12-7-66 (girdles and brassieres).

Salant & Salant, Inc., Trumann, Ark.; effective 12-8-65 to 12-7-66 (men's and boys' pants and slacks).

Scott Co., Inc., Route 6, Anderson, S.C.; effective 11-26-65 to 11-25-66 (men's dress and sport shirts).

Seminole Manufacturing Co., Aberdeen, Miss.; effective 11-23-65 to 11-22-66 (men's and boys' pants).

Seminole Manufacturing Co., Columbus, Miss.; effective 11-23-65 to 11-22-66 (men's and boys' pants).

Smith & Co., 102 West Kaskaskia, Paola, Kans.; effective 11-29-65 to 11-28-66 (loungewear).

Troy Textiles, Inc., Troy, Ala.; effective 11-24-65 to 11-23-66 (men's sport shirts).

Whiteville Manufacturing Co., Wilmington Road; Whiteville, N.C.; effective 11-7-65 to 11-6-66 (children's pants, outerwear jackets, shirts and jeans).

The following learner certificates were issued for normal labor turnover purposes. The effective and expiration dates and the number of learners authorized are indicated.

Allee-Berry, Inc., Columbus, Kans.; effective 12-8-65 to 12-7-66; 10 learners (men's and boys' pants).

Blue Bell, Inc., Shenandoah, Va.; effective 11-29-65 to 11-28-66; 10 learners (men's, boys', ladies' and girls' dungarees).

Elpern Manufacturing Inc., 113 Summit Avenue, Hagerstown, Md.; effective 11-24-65 to 11-23-66; 10 learners (children's dresses).

Marcus Manufacturing Co., 215 North Maple, Nowata, Okla.; effective 11-18-65 to 11-17-66; 10 learners (men's and boys' slacks).

Meyers & Son Manufacturing Co., Inc., New Castle, Ky.; effective 11-16-65 to 11-15-66; 10 learners (men's work suits).

Safford Manufacturing Corp., Safford, Ariz.; effective 11-15-65 to 11-14-66; 10 learners in the production of women's woven garments (women's and misses' underwear, nightwear and negligees).

Sorbeau, Inc., 821 Central Avenue, Dubuque, Iowa; effective 12-1-65 to 11-30-66; 10 learners (infants' and children's pajamas and playwear).

Sue Frocks, Inc., Broad and Pine Streets, Tamaqua, Pa.; effective 11-24-65 to 11-23-66; 5 learners (children's dresses).

The following learner certificate was issued for plant expansion purposes. The effective and expiration dates and the number of learners authorized are indicated.

Marcus Manufacturing Co., 215 North Maple, Nowata, Okla.; effective 11-18-65 to 5-17-66; 15 learners (men's and boys' slacks).

Glove Industry Learner Regulations (29 CFR 522.1 to 522.9, as amended, and 29 CFR 522.60 to 522.65, as amended).

Warren Industries, Inc., 9 Broad Street, Glens Falls, N.Y.; effective 11-29-65 to 11-28-66; 10 learners for normal labor turnover purposes (dress gloves).

Hosiery Industry Learner Regulations (29 CFR 522.1 to 522.9, as amended, and 29 CFR 522.40 to 522.43, as amended).

Francis Louise Full Fashion Mills, Inc., West Connelly Street, Valdese, N.C.; effective 11-28-65 to 11-27-66; 5 percent of the total number of factory production workers for normal labor turnover purposes (full-fashioned, seamless).

Maguet Mills, Inc., Cullom Street, Clinton, Tenn.; effective 11-29-65 to 11-28-66; 5 percent of the total number of factory production workers for normal labor turnover purposes (seamless).

Wigwam Mills, Inc., 1321 North 14th Street, Sheboygan, Wis.; effective 12-5-65 to 12-4-66; 5 percent of the total number of factory production workers for normal labor turnover purposes and in the manufacture of knitted outerwear (seamless).

Knitted Wear Industry Learner Regulations (29 CFR 522.1 to 522.9, as amended and 29 CFR 522.30 to 522.35, as amended).

The H. W. Gossard Co., Huntingburg, Ind.; effective 11-29-65 to 5-28-66; 95 learners for plant expansion purposes (brassieres, girdles, lingerie, sleepwear, slips and pants).

The H. W Gossard Co., Huntingburg, Ind.; effective 11-29-65 to 11-28-66; 5 learners for normal labor turnover purposes (brassieres, girdles, lingerie, sleepwear, slips and pants).

Ilena Mills, Inc., Manufacturers' Road, Chattanooga, Tenn.; effective 11-14-65 to 11-13-66; 5 percent of the total number of factory production workers for normal labor turnover purposes (men's and boys' tee shirts).

Kain-Murphey Corp., Manufacturers' Road, Chattanooga, Tenn.; effective 11-14-65 to 11-13-66; 5 percent of the total number of factory production workers for normal labor turnover purposes (men's and boys' briefs, children's sleepers).

Lismore Manufacturing Corp., 460 Globe Street, Fall River, Mass.; effective 12-1-65 to 11-30-66; 5 percent of the total number of factory production workers engaged in the production of women's and children's knitted underwear and sleepwear for normal labor turnover purposes (women's and children's knit underwear).

Rocky Mount Undergarment Co., Inc., 1536 Boone Street, Rocky Mount, N.C.; effective 11-18-65 to 5-17-66; 20 learners for plant expansion purposes (ladies' and children's panties).

Safford Manufacturing Corp., Safford, Ariz.; effective 11-15-65 to 11-14-66; 5 learners for normal labor turnover purposes in the production of women's knitted garments (women's, and misses' underwear, nightwear and negligees).

Signal Knitting Mills, Manufacturers' Road; Chattanooga, Tenn.; effective 11-14-65 to 11-13-66; 5 percent of the total number of factory production workers for normal labor turnover purposes (children's knitted sleeping garments).

Van Raalte Co., Inc., High Rock Avenue, Saratoga Springs, N.Y.; effective 11-19-65 to 11-18-66; 5 percent of the total number of factory production workers for normal labor turnover purposes (underwear and sleepwear).

Regulations Applicable to the Employment of Learners (29 CFR 522.1 to 522.9, as amended).

The following learner certificates were issued in Puerto Rico to the companies hereinafter named. The effective and expiration dates, learner rates, occupations, learning periods, and the number of learners authorized to be employed, are indicated.

Eleven Eleven Corp., Km. 2, Carretera No. 174, Apartado 817, Bayamon, P.R.; effective 11-1-65 to 10-31-66; 10 learners for normal labor turnover purposes in the occupations of: (1) Looping, for a learning period of 960 hours at the rates of 69 cents an hour for the first 480 hours and 76 cents an hour for the remaining 480 hours; (2) pairing, for a learning period of 360 hours at the rate of 69 cents an hour; and (3) knitting, seaming, examining, preboarding and boarding, each for a learning period of 240 hours at the rate of 69 cents an hour (men's and children's hosiery).

Four Stars Industries, Inc., Road, No. 132, Km. 12.1, Post Office Box 98, Penuelas, P.R.; effective 11-1-65 to 4-30-66; 37 learners for plant expansion purposes in the occupations of: (1) Sewing machine operating, final pressing, each for a learning period of 320 hours at the rate of 75 cents an hour; and (2) turners, for a learning period of 160 hours at the rate of 75 cents an hour (ties).

Juncos Sport Co., Inc., Avenida Munoz Rivera, Apartado A, Juncos, P.R.; effective 11-8-65 to 5-7-66; 20 learners for plant expansion purposes in the occupation of handsewing of baseballs and softballs, for a learning period of 320 hours at the rate of 68 cents an hour for the first 160 hours and 78 cents an hour for the remaining 160 hours (baseballs and soft balls).

Each learner certificate has been issued upon the representations of the employer which, among other things, were that employment of learners at special minimum rates is necessary in order to prevent curtailment of opportunities for employment, and that experienced workers for the learner occupations are not available. Any person aggrieved by the issuance of any of these certificates may seek a review or reconsideration thereof within 15 days after publication of this notice in the FEDERAL REGISTER pursuant to the provisions of 29 CFR 522.9. The certificates may be annulled or withdrawn, as indicated therein, in the manner provided in 29 CFR Part 528.

Signed at Washington, D.C., this 10th day of December 1965.

ROBERT G. GRONEWALD,
Authorized Representative of the Administrator.

[F.R. Doc. 65-13935; Filed, Dec. 29, 1965; 8:48 a.m.]

INTERSTATE COMMERCE COMMISSION

FOURTH SECTION APPLICATIONS FOR RELIEF

DECEMBER 27, 1965.

Protests to the granting of an application must be prepared in accordance with Rule 1.40 of the general rules of practice (49 CFR 1.40) and filed within 15 days from the date of publication of this notice in the FEDERAL REGISTER.

LONG-AND-SHORT HAUL

FSA 40207—*Clay from Ochlocknee, Ga.*—Filed by O. W. South, Jr., agent (No. A4819), for interested carriers. Rates on clay, kaolin, or pyrophyllite, in carloads, from Ochlocknee, Ga., to points in southwestern territory.

Grounds for relief—Market competition.

Tariff—Supplement 11 to Southern Freight Association, agent, tariff ICC S-438.

FSA 40208—*Cinders from Erwinville, La.*—Filed by Southwestern Freight Bureau, agent (No. B-8802), for interested carriers. Rates on coal, clay, shale, or slate cinders, in carloads, from Erwinville, La., to points in Mississippi.

Grounds for relief—Market competition.

Tariff—Supplement 86 to Southwestern Freight Bureau, agent, tariff ICC 4565.

By the Commission.

[SEAL] H. NEIL GARSON,
Secretary.

[F.R. Doc. 65-13931; Filed, Dec. 29, 1965; 8:48 a.m.]

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PART II
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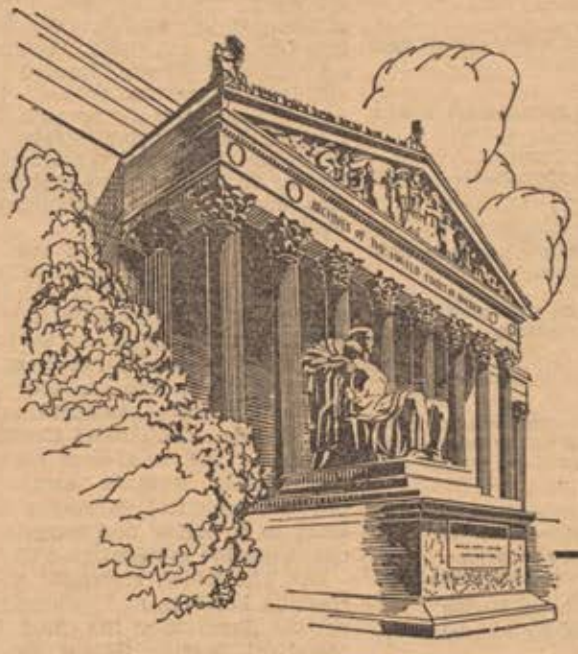
Department of the Treasury

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Coast Guard

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Shipping



Title 46—SHIPPING

Chapter I—Coast Guard, Department of the Treasury

[CGFR 65-50]

REPUBLICATION OF VESSEL INSPECTION REGULATIONS

The Vessel Inspection Regulations in 46 CFR Parts 1 through 145 are republished in their entirety in order to permit an editing of material for the purpose of obtaining uniformity in spelling of words; correction of names, addresses, and cross references; updating of procedures, etc. This republication of the regulations does not alter or change the requirements previously published in the FEDERAL REGISTER. This publication will permit the use of a single source for these regulations rather than numerous sources to show the amendments and changes made since 1938.

The changes in procedures, which are not subject to rulemaking procedures under the Administrative Procedure Act, which have been included in this document are as follows:

a. Penalty processing procedure, 46 CFR 2.50-20 (b) through (f).

b. Mailing of notices or decisions and orders by certified mail in suspension and revocation of proceedings, 46 CFR 137.05-25(b), 137.15-15(a), 137.15-20(b), and 137.20-175(c).

c. Editorial corrections of text previously published were made in 46 CFR 2.20-5(c), 10.20-1, 12.02-15, 12.15-9(c), 25.30-10(e), 30.10-22, 31.10-5(a)(1), 31.10-25, 31.30-1(b), Table 31.10-18(b), 32.25-1(b), 35.20-1(b), 66.01-1, Table 71.25-20(a)(1), 76.50-5(e), 78.05-1, Table 91.25-20(a)(1) and 95.50-5(e).

It is ordered, That the rules and regulations in 46 CFR Parts 1 through 145, reprinted as set forth below, shall be deemed to be the requirements which have a future force and effect on and after January 1, 1966.

Dated: December 20, 1965.

W. D. SHIELDS,
Vice Admiral, U.S. Coast Guard,
Acting Commandant.

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SUBCHAPTER A—PROCEDURES APPLICABLE TO THE PUBLIC

PART 1—ORGANIZATION, GENERAL COURSE AND METHODS GOVERNING MARINE SAFETY FUNCTIONS

Sec.
1.01 Organization.
1.05 Organization; districts.
1.10 Suspension and revocation proceedings.
1.15 Field examiners.
1.20 General flow of functions.
1.25 Judicial review.

AUTHORITY: The provisions of this Part 1 issued under sec. 633, 63 Stat. 545, R.S. 4405, as amended, and 4462, as amended, 14 U.S.C. 633, 46 U.S.C. 375, 416. Interpret or apply R.S. 4450, as amended, secs. 1, 2, 49 Stat. 1544, 1545, as amended, sec. 1-12, 60 Stat. 237-244, secs. 1, 2, 68 Stat. 484, sec. 3, 68 Stat. 675, sec. 3, 70 Stat. 152; 46 U.S.C. 239, 367, 239a, 239b, 390b, 5 U.S.C. 1001-1011, 50 U.S.C. 198. Treasury Department Orders 120, July 31, 1950, 15 F.R. 6521; 167-9, August 3, 1954, 19 F.R. 5195; 167-14, November 26, 1954, 19 F.R. 8026; 167-17, June 29, 1955, 20 F.R. 4976; 167-20, June 18, 1956, 21 F.R. 4894.

§ 1.01 Organization.

(a) The Commandant is the head of the agency and exercises overall direction over the policy and administration of the Coast Guard.

(b) To carry out the regulatory and enforcement aspects of marine safety, the staff officers designated in this paragraph are assigned to the Commandant. The chain of military command is from the Commandant directly to the District Commanders. The staff officers at Headquarters act only on the basis of the Commandant's authority and by his direction.

(1) The Chief, Office of Merchant Marine Safety, under the general direction of the Commandant directs, supervises, and coordinates the activities of the Chief, Merchant Marine Technical Division, Chief, Merchant Vessel Inspection Division, and Chief, Merchant Vessel Personnel Division, located at Headquarters; supervises through the District Commanders the administration of the Merchant Marine Safety Divisions of District Offices and Officers in Charge, Marine Inspection; and exercises technical control over the Merchant Marine Details in foreign ports.

(i) The Chief, Merchant Marine Technical Division, at Headquarters, under the direction of the Chief, Office of Merchant Marine Safety, passes on plans and specifications for the construction or alteration of merchant vessels, conducts or reviews stability tests on merchant vessels, examines equipment and devices submitted to Headquarters, supervises the load lines assigned by classification societies, and otherwise provides technical assistance with respect to enforcing and improving merchant marine materiel standards.

(ii) The Chief, Merchant Vessel Inspection Division, at Headquarters, under the direction of the Chief, Office of Merchant Marine Safety, administers

the inspection program for merchant vessels and the program of enforcing and improving merchant marine materiél and operational safety standards, and reviews and maintains records of marine casualties other than recreational boating accidents.

(iii) The Chief, Merchant Vessel Personnel Division, at Headquarters, under the direction of the Chief, Office of Merchant Marine Safety, administers the program for the enforcement and development of prescribed merchant marine personnel standards, including but not limited to the licensing, certificating, shipment and discharge of seamen, and the investigation and institution of proceedings looking to suspension and revocation under Title 46, U.S. Code, sections 239 and 239b, of licenses, certificates, and documents held by persons.

(2) The Chief, Office of Operations, under the general direction of the Commandant, directs, supervises, and coordinates the activities of the Chief, Recreational Boating Safety Division, located at Headquarters; and supervises through the District Commanders the administration of the recreational boating safety program.

(i) The Chief, Recreational Boating Safety Division, at Headquarters, under the direction of the Chief, Office of Operations, administers the enforcement program applicable to uninspected vessels used for recreational purposes and the imposition and collection of penalties in connection therewith; supervises the Federal numbering of undocumented vessels; reviews applications for approval of State numbering systems as required by Title 46, U.S. Code, section 527a; maintains liaison with Federal and State agencies having related interest; develops and coordinates arrangements with State Governments for cooperation in the enforcement of State and Federal laws relating to recreational boating; administers the boating accident report program and compiles, analyzes and publishes the data thus obtained, together with recommendations for the enhancement of boating safety; and reviews and maintains records of recreational boating accidents.

(3) The Chief Counsel of the Coast Guard at Headquarters, under the general direction and supervision of the General Counsel, Department of the Treasury, and the Commandant, considers cases involving alleged violations of navigation and vessel inspection laws or regulations prescribed thereunder and published in this chapter or in 33 CFR Chapter I, and reviews appeals to the Commandant from statutory monetary penalties assessed therefor. Upon completion of such a review, the Chief Counsel prepares a proposed action for the Commandant's consideration or, in appropriate cases, he takes final action on behalf of, and as directed by, the Commandant.

§ 1.05 Organization; districts.

(a) To assist the District Commander in carrying out the regulatory and enforcement aspects of marine safety in the Coast Guard Districts, there is assigned to each District Commander a staff officer designated as Chief, Merchant Marine Safety Division. The chain of military command is from the District Commander to each Officer in Charge, Marine Inspection, in his district. The Chief, Merchant Marine Safety Division, is a staff officer assigned to the District Commander and acts only on the basis of the authority of the District Commander and by his direction.

(1) The Chiefs, Merchant Marine Safety Division, in the District Offices, under the supervision of their respective District Commanders, direct the activities in their districts relative to vessel, factory and shipyard inspections; reports and investigations of marine casualties and accidents; processing of violations of navigation and vessel inspection laws; the licensing, certificating, shipment and discharge of seamen; the investigation and institution of proceedings looking to suspension and revocation under Title 46, U.S. Code, sections 239 and 239b, of licenses, certificates, and documents held by persons; and all other marine safety regulatory activities except those functions related to recreational boating when under the supervision of the Chiefs, Operations Division, in the District Offices.

(2) Unless otherwise provided for, the Chiefs, Operations Division, in the District Offices, under the supervision of their respective District Commanders, direct the activities in their districts relative to administration of the law enforcement program applicable to uninspected vessels used for recreational purposes and the imposition and collection of penalties in connection therewith; maintain liaison with Federal and State agencies having related interests; develop and coordinate agreements and arrangements with Federal and State agencies for cooperation in the enforcement of State and Federal laws related to recreational boating; and review investigative reports of recreational boating accidents.

(b) The Officers in Charge, Marine Inspection, in the Coast Guard districts, under the supervision of their respective District Commanders, are in charge of marine inspection offices located in various ports and have command responsibility within assigned marine inspection zones for the performance of duties with respect to the inspection, enforcement, and administration of navigation and vessel inspection laws, rules, and regulations governing marine safety. The Officer in Charge, Marine Inspection, has been designated and delegated to give immediate direction to Coast Guard activities relating to marine safety functions consisting of inspection of vessels in order to determine that they comply with the applicable laws, rules, and regulations relating to construction, equipment, manning, and operation, and to be satisfied that such vessels are in seaworthy condition for the services in which such vessels are to be operated; shipyard inspections; factory inspections of materials and equipment for vessels; the licensing, certificating, shipment and discharge of seamen; investigations of marine casualties and accidents; investigations of violations of law; negligence, misconduct, unskillfulness, incompetence or misbehavior of persons holding licenses, certificates, or documents issued by the Coast Guard; initiations of actions seeking suspension or revocation under Title 46, U.S. Code, sections 239 and 239b of licenses, certificates and documents held by persons, and presentation of cases at hearings before examiners; and the enforcement of navigation, vessel inspection and seamen laws in general.

(c) For descriptions of Coast Guard districts and marine inspection zones see 33 CFR Part 3.

§ 1.10 Suspension and revocation proceedings.

(a) The Commandant is the final and sole authority for action on appeals or reviews of suspension and revocation proceedings. The Commandant has not delegated the authority to make final decisions on appeals.

(b) To assist the Commandant in the general supervision of the hearing, appeal, and review functions with respect to proceedings looking to suspension and revocation of licenses, certificates, and documents (held by persons) under Title 46, U.S. Code, sections 239 and 239b, there is assigned to the Commandant's Staff a Chief Examiner who is an examiner appointed under the Administrative Procedure Act (5 U.S.C. 1001–1011).

(1) The Chief Examiner at Headquarters, under the general direction and supervision of the Commandant, is assigned the following duties:

(i) Acts as an adviser and as a special assistant to the Commandant in matters concerning hearings conducted pursuant to Title 46, U.S. Code, sections 239 and 239b;

(ii) Trains new examiners and coordinates the activities of all examiners;

(iii) Conducts hearings under Title 46, U.S. Code, sections 239 and 239b; and

(iv) Makes appropriate recommendations to the Chief Counsel for the latter's consideration in the preparation of the final actions by the Commandant with respect to appeals or in cases reviewed on the Commandant's motion under Subpart 137.35 in Part 137 of this chapter.

(c) The Chief Counsel of the Coast Guard at Headquarters, under the general direction and supervision of the General Counsel, Department of the Treasury, and of the Commandant, acts as an adviser and as a special assistant to the Commandant in all matters having legal implications.

(1) The Chief Counsel prepares a proposed decision for the Commandant's consideration in cases of appeal or review in suspension and revocation proceedings.

§ 1.15 Field examiners.

(a) The hearings conducted under Title 46, U.S. Code, sections 239 and 239b, are presided over by examiners. These examiners are located in various ports and are under the exclusive ad-

ministrative control of the Commandant.

(b) The examiners are appointed under the provisions of the Administrative Procedure Act (5 U.S.C. 1001–1011) and are civilian employees of the Coast Guard.

§ 1.20 General flow of functions.

(a) As indicated in 33 CFR 1.01–20, the Officer in Charge, Marine Inspection, is deemed to have final authority subject to the rights of appeal set forth in § 2.01–70 of this subchapter with respect to the functions described in § 1.05(b).

(b) The general course and method by which the functions (other than those dealing with suspension or revocation of licenses, certificates, or documents described in paragraph (c) of this section) concerning marine safety activities are channeled begins with the Officer in Charge, Marine Inspection, at the local Marine Inspection Office. From this officer the course is to the Chief, Merchant Marine Safety Division, on the staff of the District Commander and then to the District Commander. From the District Commander the course is to the Chief of one of the three divisions within the Office of Merchant Marine Safety at Headquarters. In most administrative cases the channel ends at this point. However, on matters of policy or appeals the course is through one of these divisions to the Chief, Office of Merchant Marine Safety, and then to the Commandant, whose decisions are final.

(c) In proceedings involving the suspension or revocation of a Coast Guard license, certificate or document issued to an individual, the course and method by which such proceedings are channeled are as follows:

(1) In the United States, the Commonwealth of Puerto Rico, Territory of Guam, the Virgin Islands, and other possessions, the proceedings are initiated by the preferment of charges and specifications against the holder of the Coast Guard license, certificate or document. A Coast Guard Investigating Officer under the supervision of an Officer in Charge, Marine Inspection, or an Officer in Charge, Marine Inspection, causes the charges and specifications to be served on the person described therein (person charged) who is a holder of a Coast Guard license, certificate or document. At a hearing the Coast Guard submits evidence to support the charges and specifications, while the person charged may submit evidence in rebuttal or mitigation. The examiner renders a decision on the basis of the evidence adduced at the hearing and the law. The examiner's decision is given to the person charged.

(i) In every case the file containing the charges and specifications and examiner's decision is forwarded by the Officer in Charge, Marine Inspection, to the District Commander, and thence to the Commandant.

(ii) In a case where an appeal is made by the person charged, the notice of appeal is filed with the District Commander of the Coast Guard District in which the hearing was held. The District Commander submits a complete transcript of the record with the notice of appeal to the Commandant.

(2) In the event an examiner is assigned to a foreign port, proceedings are initiated by the preferment of charges and specifications against the holder of a Coast Guard license certificate or document. This is usually initiated by a merchant marine detail officer (investigating officer) who causes the charges and specifications to be served on the person described therein (person charged) who is the holder of a Coast Guard license, certificate or document. At a hearing, the Coast Guard presents evidence to prove the charges and specifications, while the person charged submits evidence of denial or mitigation. The examiner then renders a decision on the basis of the evidence adduced at the hearing and the law. In each case the examiner's decision is given to the person charged. The file containing the charges and specifications and examiner's decision is forwarded by the merchant marine detail officer to the Commandant. An appeal from such an examiner's decision is filed with the District Commander in the District in which such person first arrives in the United States. The District Commander transmits the notice of appeal to the Commandant.

(3) In a foreign port where no examiner has been assigned, no proceedings are initiated by the Coast Guard. In a case originating in a foreign port where a merchant marine detail officer is assigned, such officer investigates the matter to the extent possible and then refers the case to the Officer in Charge, Marine Inspection, having jurisdiction over the vessel's first port of arrival in the United States, or its Territories, or if the person leaves the vessel, then to the Officer in Charge, Marine Inspection, having jurisdiction at such person's first port of arrival in the United States, or its Territories or to the Commandant. The Officer in Charge, Marine Inspection, investigates the case and determines whether or not proceedings are to be initiated against the holder of a Coast Guard license, certificate, or document.

(d) In the performance of their duties, all Coast Guard examiners are bound by law and the regulations in this chapter or in 33 CFR Chapter I. For publicizing statements of policy, clarification of points or procedure, and general administrative instructions, the Commandant may, from time to time, issue instructions via a series designated as "Hearing Examiners' Circulars." A complete file of these instructions is available for reading purposes during normal working hours at Headquarters, each district office, and each Marine Inspection Office.

§ 1.25 Judicial review.

(a) Nothing in this chapter shall be construed to prohibit any party from seeking judicial review of any Commandant's decision or action taken pursuant to the regulations in this part or Part 137 of this chapter with respect to suspension and revocation proceedings arising under Title 46, U.S. Code, sections 239 and 239b.

(b) In the absence of an appeal to, or review by, the Commandant from the decision of the examiner in a suspension and revocation proceeding, such decision of the examiner shall be final and binding on the person charged for all purposes as of the effective date of the decision.

PART 2—VESSEL INSPECTIONS

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AUTHORITY: The provisions of this Part 2 issued under R.S. 4405, as amended, 4462, as amended; 46 U.S.C. 375, 416. Interpret sec. 3, 60 Stat. 238, 5 U.S.C. 1002. Treasury Department Order 120, July 31, 1950, 15 F.R. 6521, unless otherwise noted.

Subpart 2.01—Inspecting and Certificating of Vessels

AUTHORITY: The provisions of this Subpart 2.01 interpret or apply under R.S. 4421, as amended, 4453, as amended; 46 U.S.C. 399, 435; E.O. 11239, July 31, 1965, 30 F.R. 9671, 3 CFR, 1965 Supp. Treasury Department Orders 167-14, November 26, 1954, 19 F.R. 8026; 167-20, June 18, 1956, 21 F.R. 4894; CGFR 56-28, July 24, 1956, 21 F.R. 5659; 167-38, October 26, 1959, 24 F.R. 8857, unless otherwise noted.

§ 2.01-1 Applications for inspections.

(a) *Application forms.* (1) Applications for the inspections of vessels required to be inspected by the Coast Guard by 46 U.S.C. 362, 363, 367, 390a, 391, 391a, 392, 395, 404, 405, 526, 1333, or 50 U.S.C. 198, shall be made by the master, owner or agent on the following Coast Guard forms which are obtainable from the Officer in Charge, Marine Inspection, at any local Marine Inspection Office, U.S. Coast Guard.

(i) CG-3752—Application for Inspection of U.S. Vessel.

(ii) CG-986—Application for Inspection of Foreign Vessel.

(2) These applications require information on name and type of vessel, nature of employment and route in which to be operated, and place where and date when the vessel may be inspected.

(b) *To whom submitted.* The completed form shall be submitted to the Officer in Charge, Marine Inspection, in the Marine Inspection Office located in, or nearest, the port at which the inspection is to be made. The applicant will be advised in writing of the time when the inspection will be made.

(c) *New vessels.* Applications for inspection of new vessels shall be preceded by the submission of applicable drawings or prints in accordance with the specific requirements in Subchapters D (Tank Vessels), E (Load Lines), F (Marine Engineering), H (Passenger Vessels), I (Cargo and Miscellaneous Vessels), J (Electrical Engineering), and/or T (Small Passenger Vessels) of this chapter applicable to that particular type of vessel and/or type of service in which the vessel is proposed to be operated.

(d) *Foreign-built vessels.* (1) Those foreign-built vessels which are specifically authorized by public or private laws to engage in the coastwise trade, and those foreign-built vessels which are documented to engage in the foreign trade shall be inspected and certificated as required by law and/or the regulations in this chapter which are applicable to their class and employment.

(2) Under certain circumstances as described in law (see 46 U.S.C. 11, 13, 289, 292, 316, 808, 883, or other laws), certain foreign-built vessels are not permitted to engage in the United States coastwise trade (domestic trade) unless specifically authorized by law. Therefore, when foreign-built vessels are intended for use in the coastwise trade as defined by the Bureau of Customs, such vessels will not be inspected and certificated unless specifically authorized by law to engage in the coastwise trade.

§ 2.01-5 Certificate of inspection.

(a) *Issuance of certificates.* Upon completion of the inspection of a vessel and on condition that the vessel and her equipment are approved by the inspectors, a certificate on one or more of the following Coast Guard forms will be issued by the Officer in Charge, Marine Inspection:

(1) CG-841—Certificate of Inspection.

(2) CG-854—Temporary Certificate of Inspection.

(3) CG-989—Certificate of Examination for Foreign Passenger Vessel.

(4) CG-3463—Certificate for Foreign Vessel to Carry Persons in Addition to Crew.

(5) CG-3753—Certificate of Inspection (for small passenger vessel).

(b) *Vessels issued certificates.* (1) All domestic vessels shall be issued a Temporary Certificate of Inspection (CG-854) and a Certificate of Inspection (CG-841) or Certificate of Inspection (for small passenger vessel) (CG-3753).

(2) Foreign passenger vessels of countries signatory to the International Convention for the Safety of Life at Sea, 1948, shall be issued a Certificate of Examination for Foreign Passenger Vessel (CG-989).

(3) Foreign passenger vessels of countries which are nonsignatory to the International Convention for the Safety of Life at Sea, 1960, shall be issued a Temporary Certificate of Inspection (CG-854) and a Certificate of Inspection (CG-841).

(4) All foreign freight vessels carrying 12 or less passengers shall be issued a Certificate for Foreign Vessels to Carry Persons In Addition to Crew (CG-3463).

(c) *Description of certificates.* The certificate of inspection issued to a vessel will describe the vessel, the route which she may travel, the minimum manning requirements, the safety equipment and appliances required to be carried on board, the total number of persons which may be carried, and the names of the operators and the owners. The period for which a certificate of inspection is valid is stated on the certificate. The certificate may be renewed by making application for inspection as provided for in § 2.01-1.

(d) *Amending certificates.* Where by reason of a change in the character of a vessel or in her route, equipment, etc., the vessel will not comply with the requirements of the certificate of inspection previously issued, a certificate amending such certificate may be issued at the discretion of the Officer in Charge, Marine Inspection, to whom request is made, on Coast Guard Form CG-858—Certificate of Inspection Amendment.

§ 2.01-7 Classes of vessels (including motorboats) examined or inspected and certificated.

(a) The regulations in this chapter concerning inspecting and certificating vessels are applicable to vessels (including motorboats) as indicated in the following table 2.01-7(a):

TABLE 2.01-7(a)

Method of propulsion	Size or other limitations [1]	Classes of vessels (including motorboats) examined or inspected under various Coast Guard regulations [1]			
		Vessels inspected and certificated under Subchapter D—Tank Vessels [2]	Vessels inspected and certificated under either Subchapter H—Passenger Vessels [2 3 4] or Subchapter T—Small Passenger Vessels [2 3 4]	Vessels inspected and certificated under Subchapter I—Cargo and Miscellaneous Vessels [2 4]	Vessels subject to provisions of Subchapter C—Uninspected Vessels [2 4 6]
Column 1	Column 2	Column 3	Column 4	Column 5	Column 6
Steam	Vessels not over 65 feet in length.	All vessels carrying combustible or flammable liquid cargo in bulk.	All vessels carrying more than 6 passengers.[7]	All tugboats and towboats.	All vessels except those covered by columns 3, 4, and 5.[8]
	Vessels over 65 feet in length.	All vessels carrying combustible or flammable liquid cargo in bulk.[8]	1. All vessels carrying more than 12 passengers on an international voyage, except yachts. 2. All vessels of not over 15 gross tons which carry more than 6 passengers.[7] 3. All other vessels carrying passengers, except: a. Yachts. b. Documented cargo or tank vessels issued a permit to carry not more than 16 persons in addition to the crew. c. Towing and fishing vessels, in other than ocean and coastwise service, may carry persons on the legitimate business of the vessel, in addition to crew, but not to exceed one for each net ton of the vessel.	All vessels except those covered by columns 3 and 4.	None.
Motor	Vessels of not over 15 gross tons.	All vessels carrying combustible or flammable liquid cargo in bulk.	All vessels carrying more than 6 passengers.[7]	Those vessels carrying dangerous cargoes when required by 46 CFR Part 98 or 146.	All vessels except those covered by columns 3, 4, and 5.
	Vessels over 15 gross tons except seagoing motor vessels of 300 gross tons and over.	All vessels carrying combustible or flammable liquid cargo in bulk.[8]	1. All vessels carrying more than 12 passengers on an international voyage, except yachts. 2. All vessels not over 65 feet in length which carry more than 6 passengers.[7] 3. All other vessels of over 65 feet in length carrying passengers for hire except documented cargo or tank vessels issued a permit to carry not more than 16 persons in addition to the crew.	All vessels carrying freight for hire except those covered by columns 3 and 4.	All vessels except those covered by columns 3, 4, and 5.
	Seagoing motor vessels of 300 gross tons and over.	All vessels carrying combustible or flammable liquid cargo in bulk.[8]	1. All vessels carrying more than 12 passengers on an international voyage, except yachts. 2. All other vessels carrying passengers, except: a. Yachts. b. Documented cargo or tank vessels issued a permit to carry not more than 16 persons in addition to the crew.	All vessels except those covered by columns 3 and 4, and those engaged in the fishing, oystering, clamming, crabbing, or any other branch of the fishery, kelp, or sponge industry.	All vessels except those covered by columns 3, 4, and 5.
Sail	Vessels not over 700 gross tons.	All vessels carrying combustible or flammable liquid cargo in bulk.	All vessels carrying more than 6 passengers.[7]	Those vessels carrying dangerous cargoes when required by 46 CFR Part 98 or 146.	None.
	Vessels over 700 gross tons.	All vessels carrying combustible or flammable liquid cargo in bulk.	All vessels carrying passengers for hire...	Those vessels carrying dangerous cargoes when required by 46 CFR Part 98 or 146.	None.
Nonself-propelled	Vessels not over 100 gross tons.	All vessels carrying combustible or flammable liquid cargo in bulk.	All vessels carrying more than 6 passengers.[7]	Those vessels carrying dangerous cargoes when required by 46 CFR Part 98 or 146.	All barges carrying passengers except those covered by column 4.
	Vessels over 100 gross tons.	All vessels carrying combustible or flammable liquid cargo in bulk.	All vessels carrying passengers for hire...	All seagoing barges except those covered by columns 3 and 4; and those inland barges carrying dangerous cargoes when required by 46 CFR Part 98 or 146.	All barges carrying passengers except those covered by column 4.

[1] Where length is used in this table it means the length measured from end to end over the deck, excluding sheer. This expression "means a straight line measurement of the overall length from the foremost part of the vessel to the aftermost part of the vessel, measured parallel to the centerline."

[2] Subchapters E (Load Lines), F (Marine Engineering), J (Electrical Engineering), and N (Dangerous Cargoes) of this chapter may also be applicable under certain conditions.

[3] Public nautical schoolships, other than vessels of the Navy and Coast Guard, shall meet the requirements of Part 167 of Subchapter R (Nautical Schools) of this chapter. Civilian nautical schoolships, as defined by 46 U.S.C. 1331, shall meet the requirements of Subchapter H (Passenger Vessels) and Part 168 of Subchapter R (Nautical Schools) of this chapter.

[4] Subchapter H (Passenger Vessels) of this chapter covers only those vessels of 100 gross tons or more. Subchapter T (Small Passenger Vessels) of this chapter covers only those vessels of less than 100 gross tons.

[5] Vessels covered by Subchapters H (Passenger Vessels) or I (Cargo and Miscellaneous Vessels) of this chapter, where the principal purpose or use of the vessel is not for the carriage of liquid cargo, may be granted a permit to carry a limited amount of flammable or combustible liquid cargo in bulk. The portion of the vessel used for the carriage of the flammable or combustible liquid cargo shall meet the requirements of Subchapter D (Tank Vessels) in addition to the requirements of Subchapter H (Passenger Vessels) or I (Cargo and Miscellaneous Vessels) of this chapter.

[6] Any vessel on an international voyage is subject to the requirements of the International Convention for Safety of Life at Sea, 1960.

[7] The meaning of the term "passenger" is as defined in the Act of May 10, 1956 (sec. 1, 70 Stat. 151; 46 U.S.C. 390).

[8] Boilers and machinery are subject to examination on vessels over 40 feet in length.

(b) The specific application of regulations concerning inspecting and certificating vessels is set forth in the specific subchapter governing a particular class of vessels.

(1) For passenger vessels see Part 70 of Subchapter H (Passenger Vessels) of this chapter.

(2) For cargo and miscellaneous vessels see Part 90 of Subchapter I (Cargo and Miscellaneous Vessels) of this chapter.

(3) For tank vessels see Part 30 of Subchapter D (Tank Vessels) of this chapter.

(4) For small passenger vessels see Part 175 of Subchapter T (Small Passenger Vessels) of this chapter.

(5) For uninspected vessels see Part 24 of Subchapter C (Uninspected Vessels) of this chapter.

§ 2.01–8 Application of regulations to vessels or tankships on an international voyage.

(a) Where, in various places or portions of this chapter, requirements are stipulated specifically for "vessels on an international voyage" or "tankships on an international voyage," it is intended that these requirements apply only to vessels or tankships, as applicable, which are subject to the International Convention for Safety of Life at Sea, 1960.

(b) For details regarding application of Convention requirements to tankships, see § 30.01–6 of this chapter; to passenger vessels, see § 70.05–10 of this chapter; to cargo ships other than tankships, see § 90.05–10 of this chapter; and to small passenger vessels, see § 176.35–1 of this chapter. (E.O. 11239, 30 F.R. 9671, 3 CFR, 1965 Supp.).

§ 2.01–10 Inspection requirements—domestic vessels.

(a) If during the inspection of a vessel made at the request of the master, owner, or agent, the vessel or her equipment is found not to conform to the requirements of law or regulations in this chapter, the requirements which must be met will be listed on Form CG–835, Notice of Merchant Marine Inspection Requirements, and given to the master of the vessel.

(b) The Coast Guard on its own initiative may examine or inspect or reinspect at anytime any vessel subject to Title 52 of the Revised Statutes (R.S. 4399–4500; 46 U.S.C. 170, 214–240, 361–498), and acts amendatory thereof or supplemental thereto. If during such examination, inspection, or reinspection, any failure to comply with any applicable requirement of law and/or applicable regulations in this chapter, or any defects or imperfections become apparent tending to render the navigation of the vessel unsafe, or that repairs have become necessary, the Coast Guard will so notify the master and state what is required.

§ 2.01–13 Inspection requirements—foreign vessels.

(a) Foreign vessels registered in countries which are parties to the effective International Convention for Safety of Life at Sea are normally subject to the examination provided for in Chapter I of that Convention. However, in the case of any vessel involving novel features of design or construction, upon which that Convention is silent or which involve potential unusual operating risks, a more extensive inspection may be required when considered necessary to safeguard the life or property in United States' ports where such vessel may enter. In such a case, pertinent plans and/or calculations may be required to be submitted sufficiently in advance to permit evaluation before inspection.

(b) Foreign vessels registered in countries which are not parties to the effective International Convention for Safety of Life at Sea, or foreign vessels registered in countries which are parties to the effective Convention but which vessels are exempted from part or all of the Convention, may under conditions specified in applicable inspection laws be subject to inspection and certification as specified in regulations governing specific categories of vessels.

(c) For details concerning application of regulations to foreign vessels, see Part 30 in Subchapter D (Tank Vessels), Part 70 in Subchapter H (Passenger Vessels), Part 90 in Subchapter I (Cargo and Miscellaneous Vessels), § 146.02–2 in Subchapter N (Dangerous Cargoes), and Part 175 in Subchapter T (Small Passenger Vessels) of this chapter.

(R.S. 4400, as amended, 4417a, as amended, 4472, as amended, sec. 26, 41 Stat. 998, as amended, sec. 3, 70 Stat. 152; 46 U.S.C. 362, 391a, 170, 882, 390b)

§ 2.01–15 Vessel repairs.

(a) The procedures to be followed in notifying the Coast Guard about vessel repairs varies according to the type of vessel and service in which engaged. Additional requirements for repairs of certain equipment and installations are in Subchapters E (Load Lines), F (Marine Engineering), and/or J (Electrical Engineering) of this chapter. The requirements by types of vessels are as follows:

(1) Tank vessels—Parts 31 and 35 of Subchapter D (Tank Vessels) of this chapter.

(2) Passenger vessels—Part 71 of Subchapter H (Passenger Vessels) of this chapter.

(3) Cargo and miscellaneous vessels—Part 91 of Subchapter I (Cargo and Miscellaneous Vessels) of this chapter.

(4) Small passenger vessels—Part 176 of Subchapter T (Small Passenger Vessels) of this chapter.

(5) Public nautical schoolships—Subpart 167.30 of Subchapter R (Nautical Schools) of this chapter.

(b) If repairs to a vessel are necessary, such vessel may be permitted to proceed to another port for repairs, if in the opinion of the inspector it can be done with safety. The permit is granted by the Officer in Charge, Marine Inspection, upon request in writing by the master or owner of the vessel and is issued on Coast Guard Form 948, Permit To Proceed to Another Port for Repairs. No repairs or alterations affecting safety of a vessel or her machinery shall be made unless applicable requirements in Subchapters D (Tank Vessels), E (Load Lines), F (Marine Engineering), H (Passenger Vessels), I (Cargo and Miscellaneous Vessels) and/or J (Electrical Engineering) of this chapter are met.

§ 2.01–20 Revocation of certificates of inspection.

(a) Under the authority of 46 U.S.C. 391, 391a, or 435 the certificates of inspection referred to in § 2.01–5 may be revoked if the vessel is found at a reinspection not to comply with the terms of the vessel's certificate of inspection.

(b) Under the authority of 46 U.S.C. 390c(c) the certificates of inspection referred to in § 2.01–5 for a small passenger vessel may be revoked or suspended if such a vessel is found not to comply with the terms of the vessel's certificate of inspection when carrying more than 6 passengers.

§ 2.01–25 International Convention for Safety of Life at Sea, 1960.

(a) *Certificates required.* (1) The International Convention for Safety of Life at Sea, 1960, requires one or more of the following certificates to be carried on board certain passenger, cargo or tankships engaged in international voyages:

(i) Passenger Ship Safety Certificate.

(ii) Cargo Ship Safety Construction Certificate.

(iii) Cargo Ship Safety Equipment Certificate.

(iv) Cargo Ship Safety Radiotelephony Certificate.

(v) Cargo Ship Radiotelegraphy Certificate.

(vi) Exemption Certificate.

(vii) Nuclear Passenger Ship Safety Certificate.

(viii) Nuclear Cargo Ship Safety Certificate.

(2) The U.S. Coast Guard will issue through the Officer in Charge, Marine Inspection, the following certificates after performing an inspection of the vessel and determining the vessel meets applicable requirements:

(i) Passenger Ship Safety Certificate.

(ii) Cargo Ship Safety Construction Certificate except when issued to cargo ships by American Bureau of Shipping at the option of the owner or agent.

(iii) Cargo Ship Safety Equipment Certificate.

(iv) Exemption Certificate.

(v) Nuclear Passenger Ship Safety Certificate.

(vi) Nuclear Cargo Ship Safety Certificate.

(3) When authorized by the Commandant, U.S. Coast Guard, the American Bureau of Shipping may issue to cargo and tankships which it classes the Cargo Ship Safety Construction Certificate.

(4) The Federal Communications Commission will issue the following certificates:

(i) Cargo Ship Safety Radiotelephony Certificate.

(ii) Cargo Ship Radiotelegraphy Certificate.

(iii) Exemption Certificate.

(b) *Applications.* (1) The application for inspection and issuance of a cer-

tificate or certificates is made on the appropriate form listed in § 2.01–1, or by letter, to the Officer in Charge, Marine Inspection, in or nearest the port at which the inspection is to be made and shall be signed by the master or agent of the vessel. The certificates previously issued are surrendered at the time the inspection is performed. Further details are set forth in Subchapter H (Passenger Vessels), Subchapter T (Small Passenger Vessels), Subchapter D (Tank Vessels) and Subchapter I (Cargo and Miscellaneous Vessels) of this chapter.

(2) The application for the inspection of a vessel other than a passenger vessel concerning the issuance of a Cargo Ship Safety Radiotelephony Certificate or a Cargo Ship Safety Radiotelegraphy Certificate is made by formal application on FCC Form 801 to the local office of the Federal Communications Commission.

(c) *Certificates issued.* (1) If a vessel meets the applicable requirements of the Convention, it shall be issued appropriate certificates listed in paragraph (a) of this section. These certificates describe the vessel and state the vessel is in compliance with the applicable requirements of the Convention.

(2) A Convention certificate may be withdrawn, revoked or suspended at any time when it is determined the vessel is no longer in compliance with applicable requirements. (See § 2.01–70 for appeal procedures.)

(d) *CG–969—Notice of Receipt of Application for Passenger Ship Safety Certificate.* (1) The Passenger Ship Safety Certificate is issued by the Commandant after determining all applicable requirements of the Convention have been met. In the event the completion of the certification of any passenger vessel cannot be effected prior to the sailing of the passenger ship on a foreign voyage, or in any case where the Passenger Ship Safety Certificate is not received from the Commandant before the ship sails on a foreign voyage, the Officer in Charge, Marine Inspection, will issue a completed Form CG–969, describing the passenger ship and certifying that an application for a Passenger Ship Safety Certificate is being processed, and that in his opinion the vessel meets applicable requirements of the Convention administered by the Coast Guard.

(2) The completed Form CG–969 may be exhibited in explanation of the failure of the passenger ship to have on board a current Passenger Ship Safety Certificate. This completed Form CG–969 may be accepted as prima facie evidence that the passenger ship described therein is in compliance with the applicable requirements of the Convention.

(e) *Exempted vessel.* (1) A vessel may be exempted by the Commandant from complying with certain requirements of the Convention under his administration upon request made in writing to him and transmitted via the Officer in Charge, Marine Inspection. In such case the exemptions are stated in the Exemption Certificate, which is issued by the Commandant through the appropriate Officer in Charge, Marine Inspection.

(2) The Exemption Certificate which modifies the Cargo Ship Safety Radiotelephony Certificate or the Cargo Ship Safety Radiotelegraphy Certificate is issued by the Federal Communications Commission.

(f) *Posting certificates.* The Convention certificates issued to a vessel shall be posted in a prominent and accessible place on the vessel in a manner similar to that for certificates of inspection.

(g) *Foreign flag vessels.* At the request of the government of a country in which is registered a vessel engaged in an international voyage, such a vessel may be issued the applicable certificate or certificates listed in paragraph (a) of this section. The certificate will be issued only after inspection has been made by the issuing agency, providing the vessel is found to comply with the requirements of the Convention.

§ 2.01–40 Passengers or persons in addition to crew on cargo or tank vessels.

(a) Under authority of 46 U.S.C. 882 a cargo vessel or a tank vessel documented under the laws of the United States and subject to inspection under applicable regulations in Subchapter D (Tank Vessels) or Subchapter I (Cargo and Miscellaneous Vessels) of this chapter may be allowed by its certificate of inspection to carry not to exceed 16 persons in addition to the crew: *Provided,* That such vessel subject to the applicable provisions of the effective International Convention for Safety of Life at Sea may carry not to exceed 12 persons in addition to the crew.

(b) The application for permission to carry persons in addition to the crew may be included in the application described in § 2.01–1. If granted it is endorsed on the certificate of inspection.

§ 2.01–45 Excursion permit.

(a) Under authority of 46 U.S.C. 453 a passenger vessel may be permitted to engage in excursions and carry additional numbers of passengers. For details see Part 71 of Subchapter H (Passenger Vessels) of this chapter.

(b) The application for an excursion permit is made by the master, owner, or agent of the vessel to the Officer in Charge, Marine Inspection, on Coast Guard Form CG–950, Application for Excursion Permit. If, after inspection, permission is granted, it is given on Coast Guard Form CG–949, Permission to Carry Excursion Party. The permit describes the vessel, the route over which and the period during which the excursions may be made, and the safety equipment required for the additional persons indicated.

§ 2.01–50 Persons other than crew on towing, oyster, or fishing steam vessels.

(a) Under authority of 46 U.S.C. 458 a steam vessel engaged in towing, oyster dredging and planting, and fishing may be permitted to carry persons in addition to its crew.

(b) The application for a permit to carry such persons may be included in the application described in § 2.01–1. If granted it is endorsed on the certificate of inspection.

§ 2.01–60 Overtime compensation.

(a) *General.* Extra compensation for overtime services performed by inspectors of vessels and their assistants, shipping commissioners and their deputies and assistants who may be required to remain on duty between the hours of 5:00 p. m. and 8:00 a. m. or on Sundays or holidays to perform services in connection with the inspection of vessels or their equipment, supplying or signing on or discharging crews of vessels is authorized by 46 U. S. C. 382b and regulations in Part 143 of this chapter, together with the method of computing such extra compensation.

(b) *Application and certification of time.* Application for the performance of such overtime services and certification of services performed is made by the master, owner, or agent of a vessel to the Officer in Charge, Marine Inspection, on Form CG–830, Application for and Certificate of Overtime Service.

(c) *Collection.* The bill for the collection of the overtime compensation is submitted by the Officer in Charge, Marine Inspection to the master, owner, or agent on whose vessel overtime services are performed on Form CG–832, Bill for Collection Overtime Services. Payment is made to the Collector of Customs of the port designated.

§ 2.01–70 Appeals.

(a) *General.* Any person aggrieved by any decision or action of the Officer in Charge, Marine Inspection, may appeal therefrom to the Coast Guard District Commander of the district in which the action or decision was made. A further appeal may be made to the Commandant, U.S. Coast Guard, from the decision of the District Commander.

(b) *Time limits.* (1) Appeals from decisions of the inspectors or the Officer in Charge, Marine Inspection, to the Coast Guard District Commander, shall be made in writing within 30 days after the decisions or actions appealed from shall have been rendered or taken. Such appeals shall set forth the requirements appealed from and the reasons why the decision or action should be set aside or revised.

(2) Appeals from the decisions of the Coast Guard District Commander to the Commandant shall be made in writing within 30 days after the decisions appealed from shall have been rendered.

(c) *Decision on appeals.* Pending the determination of the appeal, the decision of the Officer in Charge, Marine Inspection, shall remain in effect. The decision of the Commandant is final.

(R.S. 4417, as amended, 4463, as amended, secs. 1, 2, 49 Stat. 1544, as amended, sec. 3, 70 Stat. 152, sec. 3, 68 Stat. 675, sec. 8, 75 Stat. 403; 46 U.S.C. 391, 435, 222, 367, 390b, 50 U.S.C. 198, 33 U.S.C. 1007)

§ 2.01–80 Vessel inspections in Alaska.

(a) The waters of southeastern Alaska inside of the general trend of the shore from Cape Spencer, southeasterly to Cape Muzon, and thence easterly to Sitklan Island, shall be considered as

bays, sounds, and lakes other than the Great Lakes, for the purpose of administering the vessel inspection laws and applicable regulations in this chapter.

Subpart 2.20—Reports and Forms

AUTHORITY: The provisions of this Subpart 2.20 interpret or apply sec. 3, 68 Stat. 675; 50 U.S.C. 198; E.O. 11239, 30 F.R. 9671; 3 CFR 1965 Supp., unless otherwise noted.

§ 2.20–1 Forms.

(a) *Posting.* Statutes and regulations require that certain forms be posted on vessels referred to in the statutes and regulations. The titles of the forms indicate the contents of the forms. They may be obtained from any Officer in Charge, Marine Inspection. The Coast Guard forms and the statutes or regulations which require that they be posted are listed in this section.

(b) *CG–809.* This form "Station Bills, Drills, and Reports of Masters" is required by §§ 35.10–5, 78.17–50(f), and 97.15–35(d) of this chapter.

(c) *CG–811.* This placard "Lifesaving Signals and Breeches Buoy Instructions" is required by §§ 35.12–5, 78.53–5, 97.43–5, and 167.65–50 of this chapter.

(d) *CG–3256.* This form "Atomic Attack Instructions for Merchant Vessels in Port" is required by 33 CFR 122.10.

(e) *CG–807.* This form "Pilot Rules for the Great Lakes and Their Connecting and Tributary Waters" is required by 33 U.S.C. 243 and 33 CFR 90.15.

§ 2.20–5 Rules of the Road pamphlets.

(a) *Required to be carried aboard.* Statutes and regulations require that current editions of applicable Coast Guard pamphlets containing Rules of the Road shall, where practicable, be carried on board and maintained for ready reference on all vessels and craft over 65 feet in length while navigating within the certain waters as described in law or regulation. The titles indicate the waters on which generally applicable. These pamphlets may be obtained from any Marine Inspection Office. The Coast Guard pamphlet identification numbers and the statutes or regulations which require that they be carried on board certain vessels or craft over 65 feet in length are described in succeeding paragraphs in this section.

(b) *CG–169.* This pamphlet "Rules of the Road—International—Inland" is required by 33 U.S.C. 157 and 33 CFR 80.13(b) to be carried and available for ready reference, where practicable, on vessels navigating the harbors, rivers, and inland waters of the United States except the Great Lakes and their connecting and tributary waters as far east as Montreal, the Red River of the North, the Mississippi River and its tributaries above Huey P. Long Bridge, and that part of the Atchafalaya River above its junction with the Plaquemine-Morgan City alternate waterway.

(c) *CG–172.* Two copies of this pamphlet "Rules of the Road—Great Lakes" are required by 33 CFR 90.15(b) to be kept on board vessels navigating the Great Lakes and their connecting and tributary waters.

(d) *CG–184.* This pamphlet "Rules of the Road—Western Rivers" is required by 33 U.S.C. 353 and 33 CFR 95.23 to be carried and available for ready reference, where practicable, on vessels navigating the Red River of the North, the Mississippi River and its tributaries above Huey P. Long Bridge, and that part of the Atchafalaya River above its junction with the Plaquemine-Morgan City alternate waterway.

§ 2.20–40 Chief engineer's reports.

(a) Repairs to boilers and pressure vessels. The chief engineer is required to report any repairs to boilers or unfired pressure vessels in accordance with §§ 33.25–5, 78.33–1, and 97.30–1 of this chapter.

(b) The chief engineer of any vessel is required to report any accident to a boiler, unfired pressure vessel, or machinery tending to render the further use of the item unsafe until repairs are made by §§ 35.25–5, 78.33–5, and 97.30–5 of this chapter.

(c) The Chief Engineer shall report the renewal of fusible plugs in boilers by letter to the Officer in Charge, Marine Inspection, who issued the certificate of inspection when such fusible plugs are renewed at other than the inspection for certification and there is no marine inspector in attendance at the renewal. See §§ 52.70–40(j)(2) and 67.50–20(c)(2) of this chapter for the content of the letter.

§ 2.20–50 Repairs or alterations in lifesaving or fire prevention equipment.

No repairs or alterations shall be made to any lifesaving or fire-detecting or fire-extinguishing equipment except in an emergency without advance notice to the Officer in Charge, Marine Inspection. See §§ 33.01–20, 34.01–5, 78.33–10, and 97.30–10 of this chapter.

§ 2.20–60 Reports of casualties and accidents.

(a) *General.* Reports of casualties or accidents occurring on or to vessels are required by Title 33, U.S. Code, section 361, or Title 46, U.S. Code, subsection 526*l*(c), and the regulations supplementary thereto in Subparts 35.15, 78.07, 97.07, and 136.05, and § 167.65–65 of this chapter, precedent to an investigation under Title 46, U.S. Code, section 239. A written notice is required from the master, owner, agent, or operator of a vessel to the Officer in Charge, Marine Inspection, at or nearest the port where the casualty or accident occurred as soon as possible after the casualty or accident. A report is required whenever any vessel is involved in a casualty or accident involving loss of life, material loss of property, serious injury to any person, damage affecting the seaworthiness or efficiency of a vessel, stranding or grounding. Whenever a vessel collides with an aid to navigation the officer in charge shall report such collision to the nearest Officer in Charge, Marine Inspection; however, no report on Form CG–2692 is required unless it is a reportable marine casualty for other reasons.

(b) *Personal accidents.* The officer in charge of a vessel reports personal accidents on Form CG–924E (Report of Personal Injury or Loss of Life) whenever there is a loss of life on board a vessel or an accident occurs to passengers, members of the crew, and other persons who may be injured on board a vessel and incapacitated for a period in excess of 72 hours. This Form CG–924E should not be submitted if the accident involves a vessel numbered under the Federal Boating Act of 1958 when the Form CG–3865 (Boating Accident Report) should be submitted. If filed without delay, the Form CG–924E may also provide the notice required by other regulations in this chapter.

(c) *Vessel casualties.* The officer in charge of a vessel reports on Form CG–2692 (Report of Vessel Casualty or Accident) when accidents or casualties involve damage affecting seaworthiness of a vessel, stranding or grounding, or material property damage in excess of $1,500. This Form CG–2692 should not be submitted if the accident involves a vessel numbered under the Federal Boating Act of 1958 when the Form CG–3865 (Boating Accident Report) should be submitted. If filed without delay, the Form CG–2692 may also provide the notice required by other regulations in this chapter. If a vessel casualty occurs which involves loss of life, the officer in charge of a vessel shall submit with complete Form CG–2692 a separate completed Form CG–924E for each person killed or injured.

(d) *Information required.* The written notice, as well as the reports, require a description of the vessel or vessels involved, names of owner and master, location, nature and probable cause of casualty or accident, the nature and extent of injury to persons, and the damage to property. The Forms CG–924E and CG–2692 may be obtained from any local marine inspection office.

(e) *Casualty involving aids to navigation.* The officer in charge of a vessel which collides with a lightship, buoy, or other aid to navigation under the jurisdiction of the Coast Guard, or is connected with any such collision is required to report the casualty or accident to the nearest Officer in Charge, Marine Inspection. See §§ 35.15–1, 78.07–20, 97.07–20, and 136.05–20 of this chapter.

(R.S. 4450, as amended, secs. 13, 17, 54 Stat. 166, as amended, sec. 10, 18 Stat. 128, as amended; 46 U.S.C. 239, 526*l*(c), 526p, 33 U.S.C. 361)

CROSS REFERENCE: For investigations or hearings on marine casualties see Parts 4, 136, and 137 of this chapter.

Subpart 2.45—Waivers of Navigation and Vessel Inspection Laws

AUTHORITY: The provisions of this Subpart 2.45 issued under secs. 1, 2, 64 Stat. 1120; 46 U.S.C., note preceding section 1. Treasury Department Order CGFR 51–1, Jan. 23, 1951, 16 F.R. 731.

§ 2.45–1 Authority for and limitations on issuance.

Compliance with certain of the navigation and vessel inspection laws may be waived by the Commandant under authority of the act of December 27, 1950 (Public Law 50–891, secs. 1, 2, 64 Stat. 1120; 46 U.S.C., note preceding section 1), and the delegation of waiver authority contained in Department of the Treasury Order CGFR 51–1, dated January 23, 1951 (16 F.R. 731), in any case where such waiver is deemed necessary in the interest of national defense.

§ 2.45–5 Policy.

(a) It is the policy of the Coast Guard, in the current administration of the laws and regulations relating to navigation and vessel inspection, to further the interests of national defense by simplifying the procedure involved therein, eliminating all causes of delay in the sailing of vessels, and by bringing about a proper balance between the factors of safety at sea and the national defense. While it is not the policy of the Coast Guard to countenance willful violations of the laws and regulations or negligence in meeting the requirements thereof, neither is it contemplated that masters who exercise all reasonable efforts to comply with the requirements in effect be cited for violations on technical grounds.

§ 2.45–10 Waivers issued.

(a) The waivers having general applicability are published in Part 154 of this chapter, as well as in 33 CFR Part 19.

§ 2.45–15 Specific individual waivers.

(a) Applications for waivers affecting only one vessel in any one order under the provisions of § 154.01 of this chapter are made on Form CG–2633, Application for Waiver Order. The application shall state the name of the vessel, her employment, the requirements of law or regulations, waiver of which is requested, the reasons why waiver is necessary, and shall be signed by the master, owner, or agent of the vessel, or by the representative of any interested Government agency. The application shall be made to the Coast Guard District Commander or to his designated representative at the port or place where the vessel is located. In any port or place of the Canal Zone or in any foreign port or place the application shall be made to the designated representative of the Commandant at such port or place or if the Coast Guard has not established facilities in such port or place to the nearest designated representative of the Commandant at a port or place where such facilities have been established.

(b) If the request is granted, the waiver order will describe the vessel, the requirements of law or regulations waived, the conditions to which the waiver is subject, and the period of time for which the waiver is effective.

§ 2.45–20 General waivers.

(a) Applications for waivers having general applicability should be addressed to the Commandant (M), U.S. Coast Guard, Washington, D.C., 20226.

(b) Only the Commandant is authorized to issue general waivers which affect more than one vessel in one order.

Subpart 2.50—Assessment, Mitigation or Remission of Penalties

AUTHORITY: The provisions of this Subpart 2.50 interpret or apply R.S. 5294, as amended, sec. 26, 23 Stat. 59, as amended; 46 U.S.C. 7, 8.

§ 2.50–1 Delegation of authority.

(a) By virtue of the authority vested in the Secretary of the Treasury by Reorganization Plan No. 26 of 1950 (15 F.R. 4935), and by 14 U.S.C. 631, the Secretary transferred to the Commandant, U.S. Coast Guard, the functions vested in him under the navigation and vessel inspection statutes and amendments thereto (see § 2.50–40), by Treasury Department Order 120, dated July 31, 1950 (15 F.R. 6521), and subsequent Orders 167–14, dated November 26, 1954 (19 F.R. 8026), 167–20, dated June 18, 1956 (21 F.R. 4894), CGFR 56–28, dated July 24, 1956 (21 F.R. 5659), 167–32, dated September 23, 1958 (23 F.R. 7605), 167–33, dated September 23, 1958 (23 F.R. 7592), 167–38, dated October 26, 1959 (24 F.R. 8857), 167–44, dated October 18, 1960 (25 F.R. 10106), 167–45, dated June 16, 1961 (26 F.R. 5585), 167–46, dated November 6, 1961 (26 F.R. 10609), 167–48, dated October 19, 1962 (27 F.R. 10504), 167–58, dated January 29, 1964 (29 F.R. 2314), 167–64, dated December 7, 1964 (29 F.R. 17123), and 167–66, dated September 8, 1965 (30 F.R. 11735).

(b) Pursuant to granted authority from the Secretary, the Commandant may make provision for the performance of assigned functions by subordinates in the Coast Guard. Accordingly, the Commandant hereby authorizes each District Commander in his assigned district to administer certain statutes in accordance with procedures set forth in this subpart. The District Commander may further delegate such authority as he deems proper, not inconsistent with the provisions of this subpart, to his Chief of Staff, Chief, Merchant Marine Safety Division, or Chief, Operations Division, or any or all of them.

§ 2.50–5 Statutes providing for assessment, mitigation or remission of civil penalties.

(a) The general statutes authorizing the Coast Guard to assess, mitigate or remit civil penalties are sections 7 and 8 of Title 46, U.S. Code.

(b) Certain other specific statutes contain authority to assess, mitigate or remit civil penalties. (For examples, see sections 85g, 88g, 369, 457, 526p, and 527e of Title 46, U.S. Code.)

§ 2.50–10 Reports of violations of laws or regulations and instituting civil penalty proceedings generally.

(a)(1) Violations of the navigation and vessel inspection laws and regulations applicable thereto, more fully described in § 2.50–40, administered and enforced by the Coast Guard, are reported by Coast Guard personnel detecting them to the District Commander of the district in which the violations occurred. When practicable, the alleged offender shall be informed of the nature of the apparent violation at the time it is detected by any Coast Guard officer. In all other instances, he shall be so informed upon the completion of any proceeding or investigation which indicates that a violation has occurred. An appropriate form prescribed by the Commandant or a letter will be used to notify the alleged offender of the nature of the violation and to advise him relative to the administrative procedure employed in conducting civil penalty cases. The notification shall advise the alleged offender to reply within 15 days or such longer period as the District Commander may in his discretion allow in order that his statement may be considered by the District Commander. The District Commander is hereby authorized to determine whether there has been a violation of any of the pertinent laws or regulations. In the event of a violation for which a criminal sanction is not deemed to be appropriate, the District Commander shall determine whether to invoke the statutory civil penalty. He may thereafter mitigate or remit an assessed civil penalty upon receipt from the offender of a petition for relief therefrom. If after consideration of the petition for relief, the District Commander decides that no violation occurred, or that the person cited did not commit the violation, the penalty case shall be closed and that person notified of that action. Where no such petition is received, or where an offense has been established and the offender denies that he committed the violation, the District Commander shall take no mitigation or remission action but shall demand payment of the full penalty. Where demand for payment of the penalty is made and the penalty amount is not paid, the District Commander shall refer the case to the United States Attorney for collection. The civil penalty procedure is more fully described in § 2.50–20.

(2) If a report of boarding or an investigation report submitted by a Coast Guard officer or investigative body discloses evidence of violation of a Federal criminal statute, the District Commander in accordance with § 2.50–25 shall refer the findings to the United States Attorney for appropriate action.

(b) (1) The District Commander may by specific order in writing delegate to his Chief of Staff, Chief, Merchant Marine Safety Division, and/or Chief, Operations Division, the authority to determine whether to invoke the statutory civil penalty and, upon receipt from the offender of a petition for relief from a penalty so invoked, whether to mitigate or to remit the penalty, as he may deem proper. The order shall prescribe the types of cases which the designated officer may initiate and process to the same extent permitted the District Commander by this subpart, and those types of cases which that officer may initiate and process to a lesser extent. With respect to the latter category of cases, the District Commander's order shall set forth in detail the limits of the authority delegated to the designated officer.

(2) The term "District Commander", as hereinafter used in this subpart to designate the officer authorized to assess, mitigate or remit penalties, shall also include the terms "Chief of Staff" or "Chief, Merchant Marine Safety Division," or "Chief, Operations Division," as appropriate, if such officer has been delegated authority to perform such functions.

§ 2.50–15 Transfer of civil penalty cases from one District Commander to another.

(a) Ordinarily the District Commander having jurisdiction over the situs of a violation of the navigation or vessel inspection laws will initiate civil penalty proceedings. Having assumed jurisdiction in a given case by initiating an investigation or other proceedings to determine fault, the District Commander may transfer that jurisdiction to another District Commander where convenience or necessity requires: *Provided*, That the rights of the alleged offender are not prejudiced thereby.

(b) The District Commander transferring jurisdiction will forward all records applicable to the case direct to the District Commander assuming jurisdiction.

§ 2.50–20 Civil penalties.

(a) (1) Violations of Title 46, U.S. Code, sections 526 to 526u (Motorboat Act of April 25, 1940, as amended), or Title 46, U.S. Code, sections 527 to 527h (Federal Boating Act of 1958), or implementing regulations in this chapter prescribed under these laws, when observed by Coast Guard law enforcement officers, will be brought to the attention of the alleged offender upon the issuance of Form CG–4100, "Report of Boarding and Notice of Violation."

(2) Violations of other navigation and vessel inspection laws, or regulations prescribed thereunder in this chapter or in 33 CFR Chapter I, will be brought to the attention of the alleged offender by appropriate form prescribed by the Commandant or by letter.

(b) If it is decided that a violation of a navigation or a vessel inspection law has occurred, a determination will be made whether to invoke no penalty at all and close the case, or whether to invoke the full statutory penalty. In the latter event, notice of the decision shall be given to the offender by appropriate form prescribed by the Commandant or by letter. The offender may thereupon petition for relief and the District Commander or his delegatee may mitigate the penalty or remit it in full, except as the latter action is limited by paragraph (f) of this section. When no penalty is invoked or the penalty is remitted, no further action by the offender will be necessary. When the penalty is mitigated, such mitigation will be made conditional upon payment within 15 days of the notice, or within such other longer period of time as the District Commander, in his discretion, may allow.

(c) If a statutory civil penalty for any violation of law or regulation is invoked by the District Commander or his delegatee, the offender will be informed of his right to apply for relief within 15 days, or such longer period as the District Commander, in his discretion, may allow. The offender may, if he desires, appear in person before the District Commander or his designated representative. If the offender does not apply for relief but instead maintains that he is innocent of the violation(s) charged, and the District Commander, upon review, concludes that invocation of the penalty was proper and the offender persists in his position, no remission or mitigation action will be taken. On the other hand, should the offender submit his case to the District Commander on a *nolo contendere* basis, that is, by neither admitting nor denying his innocence, relief may be granted as the circumstances may warrant.

(d) (1) Upon notification to the offender of the decision of the District Commander, or his delegatee, the offender will be given instructions for making an appeal to the Commandant from the actions of the District Commander. Any such appeal shall be submitted to the Commandant through the District Commander within 15 days of the date of notification by the District Commander, or such longer period of time as the District Commander, in his discretion, may allow.

(2) In the event that there is an appeal from the decision of the Chief of Staff, the Chief, Merchant Marine Safety Division, or the Chief, Operations Division, acting under delegated authority, the District Commander shall review the case. Should the District Commander determine that the assessment of the penalty was not warranted, the case shall be closed and notification thereof given to the appellant. Those cases which, upon review by the District Commander, are determined to be properly instituted and administered in accordance with the regulations in this subpart and for which remission of the penalty is not considered justified shall be forwarded to the Commandant with the District Commander's recommendation.

(e) Should the alleged offender require additional time to present matters favorable to his case at any stage of these penalty proceedings, a request for additional time shall be addressed to the District Commander who may grant a reasonable extension of time where proper justification is shown.

(f) Under the following circumstances the District Commander shall forward cases involving violations of the navigation and vessel inspection laws to the United States Attorney with the recommendation that action be taken to collect the full statutory penalty:

(1) When, within the prescribed time, the offender does not explain the violation, appeal for mitigation or remission, or otherwise respond to letters or form inquiries from the District Commander; or,

(2) When, having responded to such inquiries, the offender fails or refuses to pay the statutory or mitigated penalty, or to appeal to the Commandant, within the time prescribed; or,

(3) When the offender denies that the violation(s) was committed by him, the District Commander, upon review, disagrees and the offender thereafter fails to respond to the demand, appeal to the Commandant, or to remit payment of the full penalty within the time prescribed (see § 2.50–10(a)(1)); or,

(4) When the offender fails to pay within the prescribed time the penalty as determined by the Commandant after consideration of the offender's appeal from the action of the District Commander.

§ 2.50–25 Criminal penalties.

(a) Prosecution in the Federal courts for violations of those laws or regulations enforced by the Coast Guard which provide, upon conviction, for punishment by fine or imprisonment is a matter finally determined by the Department of Justice. This final determination consists of deciding whether and under what conditions to prosecute or to abandon prosecution.

(b) Except in those cases where the approval of the Commandant is required, the District Commander is hereby authorized to determine whether or not a violation of a statute carrying a criminal penalty is one which would justify referral of the case to the United States Attorney. The Commandant's approval is required in the following cases where evidence of a criminal offense is disclosed:

(1) Marine casualties or motorboat accidents resulting in death.

(2) Marine Boards (Part 136 of this chapter).

(3) Violations of port security regulations (33 CFR Parts 6, 121 to 126, inclusive).

(c) The District Commander will identify the laws or regulations which were violated and make specific recommendations concerning the proceedings to be instituted by the United States Attorney in every case.

(d) Referral of a case to the United States Attorney for prosecution terminates the Coast Guard's authority with respect to the criminal aspects of a violation.

§ 2.50–30 Civil and criminal penalties.

(a) If a violation of law or regulation carries both a civil and a criminal penalty, the District Commander is hereby authorized to determine whether to initiate civil penalty proceedings, in which case the procedure outlined in § 2.50–20 will be followed, or whether to refer the case to the United States Attorney for prosecution in accordance with § 2.50–25, which outlines the appropriate procedure for handling criminal cases.

(b) When the United States Attorney declines to institute criminal proceedings, the District Commander shall decide whether to initiate civil penalty proceedings or to close the case, whereupon the alleged violator shall be notified regarding that decision.

§ 2.50–35 Procedure for payment of civil penalty for violation of law or regulation.

(a) The payment must be by postal money order or check payable to the order of the U.S. Coast Guard when mailed to the District Commander, attention of the Collection Clerk. If the payment is made in person at the Office of the District Commander, the payment may be in cash or by postal money order or check payable to the order of the U.S. Coast Guard.

(b) The payment of any penalty is acknowledged on Coast Guard Form CG–2688 (Collection Receipt).

(c) If the penalty paid is determined by the Commandant to have been improperly or excessively imposed, and the money has already been covered into the United States Treasury, the payor will be notified and requested to submit an application for a refund on Form CG–1086, "Claim for Navigation Fine Exacted in Excess or in Error," which should be mailed to the appropriate District Commander for transmission to the Commandant. Such application must be made by the payor within one year of the date of payment of the penalty. If the penalty paid is determined by the Commandant to have been improperly or excessively imposed and the money has not been covered into the United States Treasury, the Coast Guard will notify the payor and upon application will refund the penalty or that portion considered to be in excess of the proper amount.

§ 2.50–40 Specific types of violations reported.

(a) *General.* The procedures in this subpart apply to detected violations of navigation and vessel inspection statutes and the regulations issued pursuant thereto which provide for the imposition of civil penalties. These procedures do not apply to penalties set forth in Title 14, U.S. Code.

(b) *Inspection laws.* The vessel inspection laws in Title 46, U.S. Code, and implementing regulations in this chapter (unless otherwise provided in specific statutes) which invoke civil penalties for violations of those laws and regulations are set forth in sections 497 and 498 of Title 46, U.S. Code.

(c) *Numbering of undocumented vessels.* The penalty for violations of the Federal Boating Act and implementing regulations in Parts 170–173 of this chapter is in section 527e of Title 46, U.S. Code.

(d) *Motorboats.* The penalties for violations of the Act of April 25, 1940, as amended (46 U.S.C. 526–526u) and the implementing regulations in subchapter C of this chapter are in section 526o of Title 46, U.S. Code.

(e) *Marine regattas or parades.* The penalty for violating the act of April 28, 1908, as amended, and applicable regulations in 33 CFR Part 100 is in section 457 of Title 46, U.S. Code.

(f) *Reckless or negligent operation.* The civil penalty for violating the reckless and negligent operation provisions of the act of April 25, 1940 (46 U.S.C. 526*l*(a)) and the regulations in this chapter (Part 26) is applicable to the operation of all vessels and is in section 526o of Title 46, U.S. Code.

(g) *Rules of the road.* The penalties for violating applicable rules of the road and implementing regulations in 33 CFR Parts 80 to 96, inclusive, are in sections 158, 159, 244, 354, and 355 of Title 33, U.S. Code.

(h) *Load lines.* The penalties for violations of the Load Line Acts and the implementing regulations in parts 43 to 46 of this chapter are in sections 85g and 88g of Title 46, U.S. Code.

(i) *Great Lakes pilotage.* The civil penalty for violations of the Great Lakes Pilotage Act of 1960 is in section 216e of Title 46, U.S. Code.

(j) *Manning or employment of seamen.* The laws governing shipping of seamen or manning of certain vessels in Title 46, U.S. Code, and implementing regulations in this chapter in specific statutes invoke civil penalties for certain violations of those laws and regulations. (For example, see sections 562, 567, 568, 571, 575, 623, 641, 642, 643, and 672 of Title 46, U.S. Code.)

(k) *Dangerous Cargo Act and regulations.* The penalties for violations of the Dangerous Cargo Act and the implementing regulations in Parts 146 and 147 of this chapter are in subsection (14) of section 170 of Title 46, U.S. Code.

Subpart 2.75—Approvals of Safety Equipment, Materials and Installations, and Qualifications for Construction Personnel

AUTHORITY: The provisions of this Subpart 2.75 interpret or apply R.S. 4488, as amended, 4491, as amended, secs. 1, 2, 49 Stat. 1544, as amended, sec. 17, 54 Stat. 166, as amended, sec. 3, 54 Stat. 347, as amended, sec. 3, 70 Stat. 152, sec. 4(e), 67 Stat. 462, sec. 3, 68 Stat. 675, sec. 8, 75 Stat. 403; 46 U.S.C. 481, 489, 367, 526p, 1333, 390b, 43 U.S.C. 1333(e), 50 U.S.C. 198, 33 U.S.C. 1007. Treasury Department Orders 167–14, November 26, 1954, 19 F.R. 8026; 167–15, January 3, 1955, 20 F.R. 840; 167–20, June 18, 1956, 21 F.R. 4894; CGFR 56–28, July 24, 1956, 21 F.R. 5659; 167–38, October 26, 1959, 24 F.R. 8857; 167–46, November 6, 1961, 26 F.R. 10609. Additional authority is cited in parentheses following the sections affected.

§ 2.75–1 Approvals.

(a) Certain navigation and vessel inspection laws, or regulations in this chapter or in 33 CFR Chapter I, require the Commandant's approval before specific types of safety equipment, materials, or installations may be installed or used on vessels subject to Coast Guard inspection, or on other described vessels, motorboats, artificial islands, and fixed structures.

(b) The Commandant's approvals are issued to persons, partnerships, companies, or corporations who offer for sale specific items of safety equipment, materials, or installations, or intend them for their own or others' use. These approvals are intended to provide a control over the quality of such approved items. The Commandant's approvals apply only to those items constructed or installed in accordance with applicable requirements, and the details as described in the documents granting specific approval. If a specific item when manufactured does not comply with these details, then it is not considered to be approved and the approval issued does not apply to such modified item. For example, if an item is manufactured with changes in design or material not previously approved, the approval does not apply to such modified item. The failure to comply with applicable requirements and details specified in the approval subjects the holder to immediate suspension of approval as described in § 2.75–40, and if necessary, to a public hearing seeking withdrawal of approval and removal of all such items from use or installation as provided in § 2.75–50.

(c) The Commandant's approvals are issued to qualified holders in the form of certificates of approval (Form CGHQ–10030), by appropriate description and identification in documents filed with the Office of the Federal Register and published in the FEDERAL REGISTER, or by letters, or by appropriate markings on drawings, plans, etc. Under the direction of the Commandant and the Chief, Office Merchant Marine Safety, the Chief, Merchant Marine Technical Division, is hereby delegated the authority to exercise the necessary actions relating to the granting, suspension, cancellation or revocation of approvals for specific items of safety equipment, materials, or installations required by law or regulation in this Chapter or in 33 CFR Chapter I to have the Commandant's approval. The authority hereby delegated to the Chief, Merchant Marine Technical Division, may be further delegated by him in the case of suspensions.

(d) The approvals granted to holders qualifying under the regulations in this chapter or in specifications, copies of which may be obtained from the Commandant (MMT), and to which official Coast Guard numbers are assigned, will be in the form of certificates of approval. Unless specifically provided otherwise, the approval shall be valid for a period of five years from the date on the certificate of approval, but subject to suspension and/or cancellation if it is found the item offered, sold, or used as Coast Guard approved differs in any detail from the item as described in the certificate of approval and referenced material.

(e) A specific Commandant's approval granted to anyone, which is described in a certificate of approval, or a letter, or marked plans, etc., cannot be transferred to another without a specific prior authorization from the Commandant. Such a transfer without the Commandant's authorization normally terminates such approval.

(f) From time to time, appropriate notices of actions taken regarding approvals will be published in the FEDERAL REGISTER. For the information of users of approved items, a listing by names of holders of current approvals by specific items is published in a Coast Guard pamphlet CG–190, Equipment Lists.

§ 2.75–5 Certificates of approval.

(a) The Chief, Merchant Marine Technical Division, will issue a certificate of approval to the manufacturer or party

named therein and certify that such manufacturer or party has submitted satisfactory evidence that the item described therein complies with the applicable laws and regulations, which are outlined on the reverse side of the certificate.

(b) The approval shall be in effect for a period of five years from the date on the certificate of approval unless sooner canceled or suspended by proper authority, or otherwise specifically stated in the certificate.

§ 2.75–10 Procedures for obtaining approvals.

(a) The procedural requirements for obtaining approvals of items covered by specifications and bearing official Coast Guard approval numbers are set forth in Parts 160 to 164, inclusive, of this chapter. For other items the procedural requirements are usually those described in the regulations governing such items.

(b) Applications for approvals are usually in letter form and should be addressed to the Commandant (MMT), United States Coast Guard, Washington, D.C., 20226. Correspondence pertaining to a particular item required to be approved should be mailed to the Commander of the Coast Guard district in which the manufacturer's plant or factory is located. When plans, drawings, test data, etc., are required to be submitted by the manufacturer, it is desired that the application identify the material being transmitted with the application.

§ 2.75–15 Requirements and tests.

(a) Approved items described in certificates of approval are usually required to meet specific requirements and/or tests, prior to obtaining the approval. Additional factory tests to determine that proper uniformity and quality controls are followed during the manufacture of the specific items may be required. These requirements governing the manufacturer in particular are set forth in the regulations in this chapter or in specifications, copies of which may be obtained from the Commandant (MMT). If the requirements are met, a certificate of approval will be issued.

(b) When the specific item described in an application, together with accompanying drawings, plans, etc., does not meet applicable requirements or fails to meet specified tests, the applicant will be notified accordingly. The Coast Guard may suggest changes in order for the item to qualify and permit the issuance of an approval.

(c) For items not covered by specification requirements in Parts 160 to 164, inclusive (Subchapter Q—Specifications) of this chapter, the requirements in the navigation and vessel inspection laws, and applicable regulations in this chapter or in 33 CFR Chapter I apply and shall be met before approvals may be issued.

§ 2.75–20 Affidavits or certifications.

(a) In the manufacture of certain items of equipment, appliances, etc., or in their installation, affidavits or certifications are required to be submitted to the Coast Guard stating that materials and/or construction used with respect thereto will comply with the applicable navigation and vessel inspection laws and regulations in this chapter or in 33 CFR Chapter I.

(b) For requirements regarding marine engineering materials or appliances, see Subpart 61.45 of Subchapter F (Marine Engineering) of this chapter.

§ 2.75–25 Portable fire extinguishers.

(a) The portable fire extinguishers listed and labeled as "marine type" by a recognized laboratory, as provided in Subpart 162.028 of Part 162 of Subchapter Q (Specifications) of this chapter, will be accepted as approved for use on merchant vessels, motorboats, etc., whenever required by the regulations in this chapter, and for use on artificial islands and fixed structures on the Outer Continental Shelf whenever required by the regulations in 33 CFR Parts 140 to 146, inclusive.

(b) The procedures for manufacturers to follow and the requirements governing portable fire extinguishers to qualify being listed and labeled as "marine type" by a recognized laboratory are set forth in Subpart 162.028 of Part 162 of Subchapter Q (Specifications) of this chapter.

(c) The procedures for a laboratory to qualify as a "recognized laboratory" and to be listed in § 162.028–5 of Subchapter Q (Specifications) of this chapter are as follows:

(1) The laboratory shall submit an informal application in writing on its usual letterhead paper to the Commandant (MMT), United States Coast Guard, Washington, D.C., 20226, requesting recognition and listing, as a recognized laboratory.

(2) Accompanying the informal application, as identified enclosures, shall be:

(i) A certification that it is a laboratory which has been and is regularly engaged in the examination, testing, and evaluation of portable fire extinguishers.

(ii) A certification that it has an established factory inspection, listing, and labeling program, together with a complete description of it and how it works.

(iii) A description of its facilities used in the examination, testing, and evaluation of portable fire extinguishers, together with its name (if different from that of submitter), and location (city, street, and state).

(iv) A list of the names and home and office addresses of its principal officers and its managing directors (if any).

(v) A description of its special standards for listing and labeling portable fire extinguishers as "marine type," as contemplated by the specification in Subpart 162.028 of Part 162 of Subchapter Q (Specifications) of this chapter.

(3) If the Commandant finds that a laboratory qualifies as a "recognized laboratory," and it is subject to Coast Guard jurisdiction, the approval and listing will be published in the FEDERAL REGISTER and will be in effect until suspended, canceled or terminated by proper authority. The failure of a recognized laboratory to maintain its established factory inspection, listing and labeling program as approved by the Commandant shall be cause for terminating a listing as a "recognized laboratory."

(Interpret or apply R.S. 4417a, as amended, 4426, as amended, sec. 1, 2, 49 Stat. 1545, as amended, sec. 8, 54 Stat. 165, as amended; 46 U.S.C. 391a, 404, 526g)

§ 2.75–30 Special purpose water safety buoyant devices.

(a) The special purpose water safety buoyant devices listed and bearing the combination "Laboratory/USCG" labels issued by a recognized laboratory, as provided in Subpart 160.064 of Part 160 of Subchapter Q (Specifications) of this chapter, will be accepted as approved for the designated use on all motorboats and small passenger vessels, and for general use on motorboats of Classes A, 1, or 2 not carrying passengers for hire, whenever so provided by the regulations in this chapter.

(b) The procedures for manufacturers to follow and the requirements governing special purpose water safety buoyant devices to qualify for being listed and labeled with the combination "Laboratory/USCG" labels are set forth in Subpart 160.064 of Part 160 of Subchapter Q (Specifications) of this chapter.

(c) The procedures for a laboratory to qualify as a "recognized laboratory" and to be listed in § 160.064–5 of Subchapter Q (Specifications) of this chapter are as follows:

(1) The laboratory shall submit an informal application in writing on its usual letterhead paper to the Commandant (MMT), United States Coast Guard, Washington, D.C., 20226, requesting recognition and listing as a recognized laboratory.

(2) Accompanying the informal application, as identified enclosures, shall be:

(i) A certification that it has been exempted from federal income tax under section 501(c)(3) of the Internal Revenue Code of 1954 as an organization organized and operated exclusively for testing for public safety.

(ii) A certification that it has an established factory inspection, listing, and labeling program together with a complete description of it and how it works.

(iii) A description of the facilities used in the examination, testing, and evaluation of special purpose water safety buoyant devices, together with the name of the facilities (if different from that of the submitter), and location (city, street, and state).

(iv) A list of names and home and office addresses of its principal officers, and the managing directors (if any).

(v) Copies of its special standards for listing and labeling special purpose water safety buoyant devices using the combination "Laboratory/USCG" label, as contemplated by 46 CFR Subpart 160.064 of Part 160 of Subchapter Q (Specifications) of this chapter.

(3) If the Commandant finds that a laboratory qualifies as a "recognized laboratory", and it is subject to Coast Guard jurisdiction, the approval and list-

ing will be published in the FEDERAL REGISTER and will be in effect until suspended, canceled or terminated by proper authority. The failure of a recognized laboratory to maintain its established factory inspection, listing and labeling program as approved by the Commandant shall be cause for terminating a listing as a "recognized laboratory".

(R.S. 4426, as amended, sec. 6, 54 Stat. 164, as amended; 46 U.S.C. 404, 526e)

§ 2.75–40 Suspension of approval.

(a) Whenever it is determined that a specific item is not in compliance with the applicable laws, rules, and regulations, and the requirements specified in the approval issued by the Coast Guard, the District Commander or the Officer in Charge, Marine Inspection, will immediately notify the holder of the approval wherein the specific item fails to meet applicable requirements. If the defects, deficiencies or variations in the item are deemed important, such officer is authorized and may immediately suspend the approval, may require the holder to surrender the certificate of approval (if any), and may direct the holder to cease claiming the defective items are Coast Guard approved, pending a final decision from the Commandant in the matter.

(b) The procedures for appealing the temporary suspension shall be those described in § 2.01–70.

§ 2.75–50 Withdrawals or terminations of approvals.

(a) Approvals may be withdrawn if items are found not to be in compliance with the conditions of approval or if necessary by reason of changes in regulations. Notice will be given to the manufacturer who is given an opportunity to present his case at a public hearing of the Merchant Marine Council. (See 33 CFR 1.05–1, 1.05–10).

(b) Approvals of equipment are terminated when the manufacturer is no longer in business, or when the item is no longer being manufactured, or when the approval expires.

§ 2.75–60 Certification of ship's stores and supplies.

(a) Ship's stores and supplies of a dangerous nature, as defined in §§ 147.02–1 and 147.02–2 of Subchapter N (Dangerous Cargoes) of this chapter, shall not be used on board vessels, domestic or foreign, on the navigable waters of the United States, including its territories and possessions (see 33 CFR Part 2), unless they have been certified for such use by the Coast Guard.

(b) The procedure for obtaining certification of ship's stores and supplies are in §§ 147.03–1 to 147.03–10, inclusive, of Subchapter N (Dangerous Cargoes) of this chapter.

(c) The ship's stores and supplies of a dangerous nature which do not require a certification are described in §§ 147.03–1 and 147.03–11 of Subchapter N (Dangerous Cargoes) of this chapter.

(R.S. 4472, as amended; 46 U.S.C. 170)

§ 2.75–70 Welders.

(a) Welders are required to pass tests before being permitted to make welds subject to inspection by the Coast Guard. Description of the tests is contained in Part 56 of this chapter.

(R.S. 4417, as amended, 4418, as amended, 4429, as amended; 46 U.S.C. 391a, 392, 407)

Subpart 2.85—Load Lines

§ 2.85–1 Assignment of load lines.

(a) Vessels listed in 46 U.S.C. 85, 88, and 88a are required by those laws to have load lines assigned.

(b) The procedures for the assignment of load lines, the issuance of Load Line Certificates, the annual inspections required, the causes for cancellation of certificates, and the forms of those certificates are contained in Parts 43–45 of Subchapter E (Load Lines) of this chapter.

(Sec. 2, 45 Stat. 1493, as amended, sec. 2, 49 Stat. 888, as amended; 46 U.S.C. 85a, 88a)

Subpart 2.90—Plans, Drawings or Blueprints

§ 2.90–1 General requirements.

(a) Drawings, blueprints or plans showing the details of construction of vessels subject to inspection or installations thereon are required to be submitted for approval in accordance with applicable regulations in this chapter, information as to which may be obtained at any local Marine Inspection Office.

(b) The requirements for passenger vessel construction are in Parts 43–46, 70–78, of this chapter.

(c) The requirements for tank vessel construction are in Parts 30–39, 43–45, of this chapter.

(d) The requirements for cargo and miscellaneous vessel construction are in Parts 43–45, 90–97, of this chapter.

(e) The requirements for marine engineering installations or equipment are in Parts 50–69 of this chapter.

(f) The requirements for electrical engineering installations or equipment are in Parts 110–113 of this chapter.

(g) The requirements for items to be manufactured under specific approval by the Commandant are in Parts 160–164 of this chapter.

(Interpret or apply sec. 3, 68 Stat. 675; 50 U.S.C. 198. E.O. 11239, 30 F.R. 9671; 3 CFR 1965 Supp.)

Subpart 2.95—Retention of Records by the Public

AUTHORITY: The provisions of this Subpart 2.95 also interpret or apply sec. 4, 67 Stat. 462, sec. 3, 70 Stat. 152, sec. 3, 68 Stat. 675; 43 U.S.C. 1333(e), 46 U.S.C. 390b, 50 U.S.C. 198. Treasury Department Orders 167–14, Nov. 26, 1954, 19 F.R. 8026; 167–15, Jan. 3, 1955, 20 F.R. 840; 167–20, June 18, 1956, 21 F.R. 4894.

§ 2.95–1 Certificates or documents issued by Coast Guard.

(a) Certificates or documents issued to the public, as required by laws, rules, or regulations, shall be retained for the applicable period of time, as follows:

(1) If the certificate or document specifies a definite period of time for which it is valid, it shall be retained for so long as it is valid unless it is required to be surrendered; or,

(2) If the certificate or document does not specify a definite period of time for which it is valid, it shall be retained for that period of time such certificate or document is required for operation of the vessel; or,

(3) If the certificate or document is evidence of a person's qualifications, it shall be retained for so long as it is valid unless it is required to be surrendered.

(b) Nothing in this section shall be construed as preventing the Coast Guard from canceling, suspending, or withdrawing any certificate or document issued at any time.

§ 2.95–5 Certificates or documents issued by others.

(a) Certificates or documents issued by other public agencies or private organizations, which are accepted as prima facie evidence of compliance with requirements administered by the Coast Guard, shall be retained for the applicable period of time as follows:

(1) If the certificate or document specifies a definite period of time for which it is valid, it shall be retained for so long as it is valid unless it is required to be surrendered; or,

(2) If the certificate or document does not specify a definite period of time for which it is valid, it shall be retained for the period of time such certificate or document is required for operation of the vessel; or,

(3) If the certificate or document is evidence of a person's qualifications, it shall be retained for so long as it is valid unless it is required to be surrendered.

§ 2.95–10 Equipment or material required to be approved.

(a) The manufacturer of any equipment or material, which must also be approved by or found satisfactory for use by the Commandant, shall keep the required drawings, plans, blueprints, specifications, production models (if any), qualification tests, and related correspondence containing evidence that the Coast Guard has found such equipment or material satisfactory, during the period of time the approval or listing is valid. (Most of the specifications containing detailed descriptions of records required to be retained by the public are in Parts 160 to 164, inclusive in Subchapter Q (Specifications) of this chapter.

PART 3—MERCHANT MARINE PERSONNEL

Subpart 3.01—Licenses and Documents

Sec.
3.01–1 Applications for licenses or documents.
3.01–75 Appeals.

Subpart 3.10—Disclosure of Information Regarding Shipment and Discharge of Merchant Mariners

3.10–1 General.
3.10–5 Applications.

Sec.
3.10–10 Designation of representatives.
3.10–15 Shipping articles.
3.10–20 Copies of shipping articles.
3.10–25 Official logbooks.
3.10–30 Copies of logbook entries.
3.10–35 Costs.

Subpart 3.13—Shipment and Discharge of Seamen

3.13–1 Signing-on and discharging seamen.
3.13–10 Shipping articles.
3.13–15 Forecastle card.
3.13–30 Allotments.
3.13–35 Logbooks.
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3.13–50 Service record.

Subpart 3.15—Arbitration by Shipping Commissioners

3.15–1 Arbitration.
3.15–5 Mutual releases.

Subpart 3.19—Effects of Deceased or Deserting Seamen

3.19–1 Accounts of wages and effects.
3.19–5 Kinsman's petition.

CROSS REFERENCE: For Coast Guard jurisdiction, see 33 CFR Part 1.

Subpart 3.01—Licenses and Documents

AUTHORITY: The provisions of this Subpart 3.01 issued under R.S. 4405, as amended, 4462, as amended; 46 U.S.C. 375, 416. Interpret or apply sec. 7, 49 Stat. 1936, as amended, sec. 3, 70 Stat. 152, sec. 3, 68 Stat. 675; 46 U.S.C. 689, 390b, 50 U.S.C. 198. Treasury Department Orders 120, July 31, 1950, 15 F.R. 6521; 167–14, Nov. 26, 1954, 19 F.R. 8026; 167–20 June 18, 1956, 21 F.R. 4894.

§ 3.01–1 Applications for licenses or documents.

Applications for licenses, extension of routes, or documents required for officers or seamen by 46 U.S.C. 214, 224, 226, 228, 229, 229b, 230–237, 243, 367, 391a, 404, 405, 526f, 1333, 672, 643, 481, or 50 U.S.C. 198 and the regulations in Parts 10 and 12 of this chapter as a prerequisite for employment shall be made on one of the following Coast Guard forms which are obtainable from the Officer in Charge, Marine Inspection, at any local marine inspection office: CG 866, License application; CG–719, Seaman's certificate application. The procedures for obtaining the licenses or documents, renewals, if necessary, or duplicates, if lost; the qualifications; and examinations necessary, are all set forth in Parts 10 and 12 of this chapter, together with Coast Guard numbers and titles of forms used, obtainable from any marine inspection office.

§ 3.01–75 Appeals.

(a) *General.* Any person aggrieved by any decision or action of the Officer in Charge, Marine Inspection, may appeal therefrom to the Coast Guard District Commander of the district in which the action or decision was made. A further appeal may be made to the Commandant, U.S. Coast Guard, from the decision of the District Commander.

(b) *Time limits.* (1) Appeals from decisions of the inspectors or the Officer in Charge, Marine Inspection, to the Coast Guard District Commander, shall be made in writing within 30 days after the decisions or actions appealed from shall have been rendered or taken. Such appeals shall set forth the requirements appealed from and the reasons why the decision or action should be set aside or revised.

(2) Appeals from the decisions of the Coast Guard District Commander to the Commandant shall be made in writing within 30 days after the decisions appealed from shall have been rendered.

(c) *Decision on appeals.* Pending the determination of the appeal, the decision of the Officer in Charge, Marine Inspection, shall remain in effect. The decision of the Commandant is final.

Subpart 3.10—Disclosure of Information Regarding Shipment and Discharge of Merchant Mariners

AUTHORITY: The provisions of this Subpart 3.10 issued under R.S. 4405, as amended, 4462, as amended, sec. 7, 49 Stat. 1936, as amended; 46 U.S.C. 375, 416, 689. Interpret or apply R.S. 4448, as amended, 4551, as amended, secs. 1, 2, 49 Stat. 1544, as amended, sec. 3, 70 Stat. 152, sec. 3, 60 Stat. 238, sec. 3, 68 Stat. 675; 46 U.S.C. 234, 643, 367, 390b, 5 U.S.C. 1002, 50 U.S.C. 198. Treasury Department Orders 120, July 31, 1950, 15 F.R. 6521; 167–14, Nov. 26, 1954, 19 F.R. 8026; 167–20, June 18, 1956, 21 F.R. 4894.

§ 3.10–1 General.

(a) Upon oral or written inquiry to the Coast Guard, information will be released as to the dates and ports of the commencement and termination of all voyages by merchant vessels for which shipping articles are signed before shipping commissioners. The inquiry should be addressed to the Officer in Charge, Marine Inspection, who has custody over such records.

(b) Other information contained in shipping articles or logbooks covering voyages of merchant vessels which are required to be kept by the Coast Guard will be released only to the extent and under the conditions provided in this subpart.

§ 3.10–5 Applications.

(a) *Form.* The applications for access to and release of information may be made orally except when the regulations in this subpart require a written application for such record. When a written application is required the application should be addressed to the Officer in Charge, Marine Inspection, or to the person designated as having authority to grant access to or release of information from such records. The written application shall be executed by the parties desiring the information or by any person designated to represent such party as described in § 3.10–10.

(b) *Contents.* The application shall:

(1) Clearly state or describe the information desired;

(2) Identify the applicant, and if the applicant is a representative of another, specify the nature of the representation and attach proof of designation when required;

(3) Set forth the interest of the applicant in the subject matter;

(4) The purpose for which the information is desired; and

(5) Whether or not the information or record sought is intended for use in prosecuting a claim against the United States.

§ 3.10–10 Designation of representatives.

(a) In any case when access to or release of information from any record is permitted to any party by this subpart, the permission shall extend, when such party is deceased or incompetent, to an executor, administrator, heir, guardian, trustee, or legal representative of such party: *Provided*, That the relationship is established by production of satisfactory documentary evidence.

(b) When access to or release of information from any record is sought by one acting as agent or attorney on behalf of any party recognized by regulations in this chapter, the representation as agent or attorney shall be established by the filing with the Officer in Charge, Marine Inspection, documentary proof of such representation. This proof may be in one of the following forms:

(1) A statement of authority in the handwriting of and signed by the party represented; or,

(2) A notarized statement of authority signed by the party represented; or,

(3) A copy of a contract of retainer signed by the party represented.

(c) This authorization shall contain a statement of the specific matters in in which representation is authorized.

§ 3.10–15 Shipping articles.

(a) Upon oral or written inquiry, access to and release of information from shipping articles may be had by:

(1) The master, owner, charterer, or operator, or an agent of the owner, charterer, or operator, of the vessel for voyage(s) covered by the shipping articles.

(2) Any officer of the United States Government acting in the course of his official duty.

(3) Any officer of a State, Territory, or Possession, or any political subdivision thereof, or the District of Columbia, acting in the course of his official duty.

(b) Upon oral or written inquiry, access to and release of information with respect to general provisions in the shipping articles and specific entries therein pertaining to a crewmember may be had by such crewmember for voyage(s) covered by the shipping articles.

(c) In any case of personal injury, illness, or death of any member of the crew, a crewmember or his authorized representative, upon written application, may examine the shipping articles and may make excerpts of such entries therein pertaining to such party. In addition, when the written application identifies certain crewmembers who may have personal knowledge of such injury, illness, or death by names, nicknames, or ratings, excerpts may be made with respect to their names and addresses, "Z" or "BK" numbers, ratings, and names and addresses of their next of kin.

§ 3.10–20 Copies of shipping articles.

(a) For any party allowed to have access to and release of information from shipping articles by § 3.10–15(a), certified copies may be furnished upon request.

(b) For any party allowed to make excerpts from shipping articles by § 3.10–15 (b), certified copies of such excerpts may be furnished upon request.

§ 3.10–25 Official logbooks.

(a) Upon oral or written inquiry, access to and release of information from official logbooks may be had by:

(1) The master, owner, charterer, or operator, or an agent of the owner, charterer, or operator, of the vessel for the voyage(s) covered by the official logbook.

(2) Any officer of the United States Government acting in the course of his official duty.

(3) Any officer of a State, territory, or possession, or any political subdivision thereof, or the District of Columbia, acting in the course of his official duty.

(b) Upon written application, the examination of official logbooks may be permitted to the following:

(1) Any member of the crew for voyage(s) covered by the official logbook.

(2) Any passenger transported or any owner of cargo shipped on voyage(s) covered by the official logbook.

(3) Any underwriter of the vessel or its cargo for voyage(s) covered by the official logbook.

(4) Any representative of any party described in this paragraph when authorized in accordance with § 3.10–10.

(c) Excerpts may be made by parties described in paragraph (b) of this section of such entries in the official logbook which pertain to the party making the application. In addition, when the application states in general terms the information desired, excerpts may be made of these entries in the official logbook which are demonstrated to the custodian as being relevant and material to the interest of the party as stated in the application.

§ 3.10–30 Copies of logbook entries.

(a) For any party allowed to have access to and release of information or to make excerpts of certain entries from official logbooks by § 3.10–25, certified copies of such entries may be furnished upon request.

§ 3.10–35 Costs.

The access to and release of information, as authorized in this subpart, shall be subject to the payment of costs. (See 33 CFR 1.25)

Subpart 3.13—Shipment and Discharge of Seamen

AUTHORITY: The provisions of this Subpart 3.13 issued under R.S. 4405, as amended, 4462, as amended; 46 U.S.C. 375, 416. Interpret or apply sec. 7, 49 Stat. 1936, as amended, sec. 3, 68 Stat. 675; 46 U.S.C. 689, 50 U.S.C. 198. Treasury Department Orders 120, July 31, 1950, 15 F.R. 6521; 167–14, Nov. 26, 1954, 19 F.R. 8026.

§ 3.13–1 Signing-on and discharging seamen.

The master of any merchant vessel of 75 tons or upward, engaged in the intercoastal trade or of any vessel bound from a port in the United States to any foreign port, other than vessels engaged in trade between the United States and the British North American possessions or the West Indies, or the Republic of Mexico, is required to enter into an agreement with each member of the crew who shall be discharged under the agreement and receive wages in the presence of a shipping commissioner in accordance with 46 U.S.C. 564. Where the complete crew has been signed on in the presence of a shipping commissioner and the later shipment of other seamen becomes necessary because of desertion or casualty, the master may sign on such replacements without the presence of a shipping commissioner but he is required to report the transaction immediately upon arrival at first port of call to the United States consul at or nearest such port, or in the Panama Canal Zone to the shipping commissioners or deputy shipping commissioners there. Shipping commissioners may, at the request of the master or owner of a vessel, ship and discharge all or part of the crew of a vessel engaged in the coastwise trade, or trade between the United States and the Dominion of Canada, or Newfoundland, or the West Indies, or Mexico, in accordance with 46 U. S. C. 646.

§ 3.13–10 Shipping articles.

For the signing-on and discharging of seamen in accordance with 46 U.S.C. 564, 565, 566, and 713, and the regulations in Part 14 of this chapter, the shipping commissioners furnish Forms CG–705, CG–705A, and CG–705B, Shipping articles, same except for size, to record the agreement entered into between the master and crew of a vessel. Copies of these forms are obtainable upon request from shipping commissioners or Officers in Charge, Marine Inspection, at marine inspection offices, U.S. Coast Guard. It is the duty of shipping commisioners to see that each officer signing on is in possession of a continuous discharge book, certificate of identification, or United States merchant mariner's document, and a license; and that each signing on in an unlicensed capacity is in possession of a continuous discharge book or a certificate of identification and a certificate of service or certificate of efficiency or a United States merchant mariner's document representing such certificates. The shipping articles are prepared in quadruplicate, original and duplicate retained by the master pending completion of voyage, the triplicate retained by shipping commissioner, and quadruplicate forwarded to Commandant, U. S. Coast Guard. After the members of the crew are signed on the shipping commissioner prepares Form CG–708, Shipping of Seamen, certifying that the crew members knew and willingly signed the shipping articles, which is attached to the shipping articles. When the voyage or period of time covered by the shipping articles is completed, the members of the crew are discharged and the wages paid in the presence of the shipping commissioner, if required by law, and proper entries made in the shipping articles.

§ 3.13–15 Forecastle card.

At the commencement of every voyage or engagement the master is required to post certain excerpts from the shipping articles in such part of the vessel as to be accessible to the crew in accordance with 46 U. S. C. 577. The Forecastle Card, Form CG–704, is obtainable from shipping commissioners or Officer in Charge, Marine Inspection, U. S. Coast Guard.

§ 3.13–30 Allotments.

A merchant mariner desiring to make an allotment of his wages, in accordance with the regulations in Part 15 of this chapter, fills out Form CG–722, Seaman's Allotment Note, furnished by the shipping commissioner at the time he signs the shipping articles, or copies may be obtained upon request from shipping commissioners in the United States ports, or from United States consular officers in foreign ports. If the allotment complies with the law, it is approved. No appeals are permitted.

§ 3.13–35 Logbooks.

Every vessel of 75 tons or upward, engaged in the intercoastal trade, or any vessel bound from a port in the United States to any foreign port, other than in the British North American possessions, shall have an official logbook and every master of such vessel shall make or have entries made therein regarding matters required by 46 U.S.C. 201, 202, 203, 701, 702, and 85. One or more copies of the official logbook, Coast Guard Form CG–706–B or 706–C, depending upon the number of persons employed as crew, is furnished the master of a vessel at the time the crew is signed on before a shipping commissioner; or copies of the official logbook are obtainable upon request from the Officer in Charge, Marine Inspection. After the official logbooks have served their purpose they are filed with the shipping commissioner or Officer in Charge, Marine Inspection.

§ 3.13–40 Discharges.

When a master of a vessel in accordance with Part 14 of this chapter discharges a merchant seaman and makes entries in the seaman's continuous discharge book, he will fill out Form CG–718E, Record of Entry in Continuous Discharge Book, which is forwarded to the Commandant, United States Coast Guard. The Form CG–718E is obtainable from shipping commissioners, collectors of customs and deputy collectors of customs acting as shipping commissioners or Officers in Charge, Marine Inspection. When a seaman holds a certificate of identification, a certificate of discharge, Form CG–718A, is issued and approved by a shipping commissioner or master as evidence of service performed. This form may be obtained upon request from shipping commissioners, collectors of customs or deputy

collectors of customs acting as shipping commissioners or Officers in Charge, Marine Inspection.

§ 3.13–45 Seamen not shipped or discharged before shipping commissioners.

Masters of certain vessels are required to report on ship personnel not shipped or discharged before a shipping commissioner. The Form CG–735 (T) has been prepared and must be used by the masters in accordance with Part 14 of this chapter. The form may be obtained upon request from shipping commissioners, collectors or deputy collectors of customs acting as shipping commissioners, or Officers in Charge, Marine Inspection. When voyage is completed, it must be delivered to nearest marine inspection office for transmission to Headquarters.

§ 3.13–50 Service record.

A merchant mariner upon discharge in accordance with the requirements of Part 14 of this chapter has recorded in his continuous discharge book entries regarding his service. When the merchant mariner requests in person or writing for a record of sea service shown in a surrendered continuous discharge book, the Officer in Charge, Marine Inspection, or other issuing officer will prepare in duplicate Form CG–723, Certificate of Seamen's Service, and will deliver the original to the seaman and send the duplicate to Commandant, U.S. Coast Guard.

Subpart 3.15—Arbitration by Shipping Commissioners

AUTHORITY: The provisions of this Subpart 3.15 issued under R.S. 4405, as amended, 4462, as amended; 46 U.S.C. 375, 416. Interpret or apply sec. 7, 49 Stat. 1936, as amended, sec. 3, 68 Stat. 675; 46 U.S.C. 689, 50 U.S.C. 198. Treasury Department Orders 120, July 31, 1950, 15 F.R. 6521; 167–14, Nov. 26, 1954, 19 F.R. 8026.

§ 3.15–1 Arbitration.

The Form CG–717, Agreement as to Arbitration, is used by seamen, master, consignees, agents or owners of vessels in submitting matters to shipping commissioners. This form is obtainable from shipping commissioners or collectors of customs or deputy collectors of customs acting as shipping commissioners. One copy of the form is made and this copy is retained by the shipping commissioner who acts on the matters submitted and his decision is final. No appeals are allowed.

§ 3.15–5 Mutual releases.

The Form CG–713A, Mutual Release, is used by masters and seamen to effect settlement of claims for wages in cases of seamen signed off prior to completion of a voyage. This form may be obtained from shipping commissioners or collectors of customs or deputy collectors of customs acting as shipping commissioners. One copy is prepared and retained by the shipping commissioner who acts on the matters involved and his decision is final. A certificate of mutual release, Form CG–739, is prepared by the shipping commissioner or person acting as shipping commissioner, signed by the seaman when given to him by the shipping commissioner, and is used by the seaman not present at sign-off of vessel's crew as evidence that he has signed a mutual release. This form is prepared in duplicate from information in shipping articles and official logbook.

Subpart 3.19—Effects of Deceased or Deserting Seamen

AUTHORITY: The provisions of this Subpart 3.19 issued under R.S. 4405, as amended, 4462, as amended; 46 U.S.C. 375, 416. Interpret or apply sec. 7, 49 Stat. 1936, as amended, sec. 3, 68 Stat. 675; 46 U.S.C. 689, 50 U.S.C. 198. Treasury Department Orders 120, July 31, 1950, 15 F.R. 6521; 167–14, Nov. 26, 1954, 19 F.R. 8026.

§ 3.19–1 Accounts of wages and effects.

The masters of certain United States vessels in the cases of deceased or deserting seamen have to prepare Form CG–1517, Account of Wages and Effects of Deceased or Deserting Seamen, for use in disposition of the wages and effects of such seamen. The forms may be obtained upon request from shipping commissioners, collectors or deputy collectors of customs acting as shipping commissioners, or Officers in Charge, Marine Inspection. Four copies are prepared and submitted to the shipping commissioner for transmission to the District Court. The shipping commissioner upon examination of information on the form, may approve or disapprove the account after reviewing the vessel's official logbook. No appeal is permitted. The seamen's next of kin is informed of the action taken.

§ 3.19–5 Kinsman's petition.

The next of kin of a deceased seaman has to petition the District Court of the United States for the wages and effects of the deceased seaman on Form CG–726, Kinsman's petition for wages and effects of deceased seaman. This form may be obtained upon request from shipping commissioners, collectors or deputy collectors of customs acting as shipping commissioners, or Officers in Charge, Marine Inspection. One copy of the form is presented by the next of kin to the United States District Court who acts upon the petition and either approves or disapproves the petition.

PART 4—INVESTIGATIONS AND HEARINGS

Subpart 4.01—Casualties and Accidents

Sec.
4.01–1 Reports.
4.01–5 Investigation.

AUTHORITY: The provisions of this Part 4 issued under secs. 2, 633, 63 Stat. 496, 545; 14 U.S.C. 2, 633. Interpret or apply R.S. 4450, as amended, sec. 3, 68 Stat. 675; 46 U.S.C. 239, 50 U.S.C. 198. Treasury Department Orders 120, July 31, 1950, 15 F.R. 6521; 167–14, Nov. 26, 1954, 19 F.R. 8026; 167–17, June 29, 1955, 20 F.R. 4976.

CROSS REFERENCE: For Coast Guard jurisdiction, see 33 CFR Part 1.

§ 4.01–1 Reports.

(a) Regulations regarding reports of marine casualties and accidents are in Part 136 of this chapter.

(b) Regulations regarding reports of boating accidents under the Federal Boating Act of 1958 are in Part 173 of this chapter.

§ 4.01–5 Investigation.

(a) Regulations for casualty and accident investigation procedures are contained in Part 136 of this chapter.

SUBCHAPTER B—MERCHANT MARINE OFFICERS AND SEAMEN

PART 10—LICENSING OF OFFICERS AND MOTORBOAT OPERATORS AND REGISTRATION OF STAFF OFFICERS

Subpart 10.01—General

Sec.
10.01–1 Purpose of regulations.
10.01–5 Authority for regulations.

Subpart 10.02—General Requirements for All Deck and Engineer Officers' Licenses

10.02–1 Issuance of licenses.
10.02–3 Original license defined.
10.02–5 Requirements for original licenses.
10.02–7 Requirements for raise of grade of license.
10.02–9 Requirements for renewal of license.
10.02–13 Sea service as a member of the Armed Forces of the United States and on vessels owned by the United States as qualifying experience.
10.02–15 Lifting of limitations.
10.02–19 Reexaminations and refusal of licenses.
10.02–21 Laws, general rules and regulations, and Rules of the Road to be furnished licensed officers.
10.02–23 Issuance of duplicate license.
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10.20-5 Professional examinations.
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Subpart 10.25—Registration of Staff Officers

10.25-1 Application of regulations.
10.25-3 Grades of certificates issued.
10.25-5 Staff department defined.
10.25-7 General requirements.
10.25-9 Experience requirements.

AUTHORITY: The provisions of this Part 10 issued under R.S. 4405, as amended, 4462, as amended; 46 U.S.C. 375, 416. Treasury Department Order 120, July 31, 1950, 15 F.R. 6521, unless otherwise noted.

Subpart 10.01—General

§ 10.01-1 Purpose of regulations.

(a) The purpose of the regulations in this part is to provide a comprehensive and adequate means of determining the qualifications an applicant must possess in order to be eligible for a license as deck or engineer or radio officer on merchant vessels, or a license to operate motorboats or for a certificate of registry as staff officer.

§ 10.01-5 Authority for regulations.

(a) *General.* The authority to prescribe regulations generally is set forth in Title 46, U.S. Code, sections 375 and 416, as well as in certain other provisions in Title 46, U.S. Code, sections 170, 214, 215, 222, 224, 224a, 226, 228, 229, 230-234, 239, 240, 361, 362, 364, 372, 381, 391, 391a, 392, 393, 399, 400, 402-414, 435, 436, 451-453, 460, 461, 462, 464, 467, 470-482, and 489-498, and acts amendatory thereof or supplemental thereto. Under the provisions of Title 46, U.S. Code, section 372, the Commandant, United States Coast Guard, superintends the administration of the vessel inspection laws and is required to produce a correct and uniform administration of the inspection laws, rules and regulations.

(b) *Deck and engineer officers' licenses.* The regulations regarding requirements for deck and engineer officers' licenses interpret or apply Title 46, U.S. Code, sections 214, 224, 224a, 225, 226, 228, 229, 230, 231, 233, 237, 367, 391a, 404, 405, 672a, and 1132, and Title 50, U.S. Code, section 198. The regulations regarding requirements for deck and engineer officers' licenses for officers on vessels subject to the Officers' Competency Certificates Convention, 1936, interpret or apply Title 46, U.S. Code, section 224a.

(c) *Radio officers.* The regulations regarding the licensing of radio officers interpret or apply Title 46, U.S. Code, sections 229a-229h.

(d) *Motorboat operators' licenses.* The regulations regarding the licensing of motorboat operators interpret or apply Title 46, U.S. Code, sections 526f and 526p.

(e) *Staff officers.* The regulations regarding the registration of staff officers interpret or apply Title 46, U.S. Code, section 247.

(f) *Operators' and ocean operators' licenses.* The regulations regarding the operators' and ocean operators' licenses interpret or apply Title 46, U.S. Code, section 390b.

Subpart 10.02—General Requirements for All Deck and Engineer Officers' Licenses

AUTHORITY: The provisions of this Subpart 10.02 interpret or apply R.S. 4417a, as amended, 4426, as amended, 4427, as amended, 4438, as amended, 4438a, as amended, 4439, as amended, 4440, as amended, 4441, as amended, 4442, as amended, 4443, as amended, 4445, as amended, sec. 2, 29 Stat. 188, as amended, sec. 1, 34 Stat. 1411, as amended, secs. 1, 2, 49 Stat. 1544, 1545, as amended, sec. 3, 70 Stat. 152, and sec. 3, 68 Stat. 675; 46 U.S.C. 391a, 404, 405, 224, 224a, 226, 228, 229, 214, 230, 231,

225, 237, 367, 390b, 50 U.S.C. 198. Treasury Department Orders 167-14, Nov. 26, 1954, 19 F.R. 8026; 167-20, June 18, 1956, 21 F.R. 4894, unless otherwise noted.

§ 10.02-1 Issuance of licenses.

(a) Applicants for licenses are charged with the duty of establishing to the satisfaction of the Coast Guard that they possess all of the qualifications necessary, such as age, experience, character and citizenship, before they shall be entitled to be issued licenses. Until an applicant meets this mandatory requirement, he is not entitled to be licensed to serve as an officer on a vessel of the United States. No person who has been convicted by court-martial of desertion or treason in time of war, or has lost his nationality for any of the other reasons listed in 8 U.S.C. 1481, is eligible for a license. Neither is a person eligible for a license, who has been convicted by a court of record of a violation of the narcotic drug laws of the United States, the District of Columbia, or any State or Territory of the United States, within ten years prior to the date of filing the application; or who, unless he furnishes satisfactory evidence that he is cured, has ever been the user of or addicted to the use of a narcotic drug.

(b) After application to an Officer in Charge, Marine Inspection, any person who is found qualified under the requirements set forth in this subchapter shall be issued an appropriate license valid for a term of five (5) years. In appropriate cases a limitation commensurate with the experience of the applicant shall be placed upon the license.

(c) Every person to whom a license is issued shall place his signature and left thumb print thereon, and upon any sheets attached for additional indorsements.

(d) Every person who receives a license shall make oath before an Officer in Charge, Marine Inspection, or commissioned officer of the Coast Guard authorized to administer oaths under 10 U.S.C. 936 or 14 U.S.C. 636, to be recorded upon his official file, that he will faithfullly and honestly, according to his best skill and judgment, without concealment or reservation, perform all the duties required of him by law and obey all lawful orders of his superior officers.

(Sec. 2, 68 Stat. 484; 46 U.S.C. 239b, Treasury Department Order 167-9, August 3, 1954, 19 F.R. 5195)

§ 10.02-3 Original license defined.

The first license issued to any person by the Coast Guard shall be considered an original license, when the United States records show no previous issue to such person.

§ 10.02-5 Requirements for original licenses.

(a) *General.* Before an original license is issued to any person to act in a licensed capacity on inspected vessels of the United States, he shall personally appear before an Officer in Charge, Marine Inspection and present satisfactory documentary evidence of his eligibility in respect to the requirements of this section.

(b) *Minimum age.* Any person who has attained the age of 21 years and is qualified in all other respects shall be eligible for a license except that a license as third mate, third assistant engineer or second class pilot may be granted an applicant who has reached the age of 19 years and who is qualified in all other respects, but no such license may be raised in grade before the holder thereof shall have reached the age of 21 years.

(c) *Citizenship.* No license shall be issued to any person who is not a citizen of the United States, either native-born or fully naturalized. The Officer in Charge, Marine Inspection must be satisfied as to the bona fides of all evidence of citizenship presented, and may reject any evidence that he has reason to believe is not authentic. Acceptable evidence of citizenship is described below in the order of its desirability, except that the first six (6) acceptable methods will be assigned equal weight:

(1) Birth certificate or certified copy.

(2) Certificate of Naturalization.

(3) Baptismal certificate or parish record recorded within one year after birth.

(4) Statement of a practicing physician certifying that he attended the birth and that he has a record in his possession showing the date on which it occurred.

(5) State Department passport.

(6) A commission in the United States Navy, Marine Corps, Coast Guard, either regular or reserve; or satisfactory documentary evidence of having been commissioned in one of these services subsequent to January 1, 1936, provided such commission or evidence shows the holder to be a citizen.

(7) A continuous discharge book, certificate of identification, or merchant mariner's document issued by the Coast Guard or by the former Bureau of Marine Inspection and Navigation which shows the holder as an American citizen, provided the records indicate that the holder of such continuous discharge book, certificate of identification, or merchant mariner's document produced satisfactory evidence of his citizenship at the time of the issuance of the same.

(8) Delayed certificate of birth. If an applicant claiming to be a citizen of the United States submits a delayed certificate of birth issued under a State's seal, it may be accepted as prima facie evidence of citizenship in the absence of any collateral facts indicating fraud in its procurement.

(9) For persons deriving citizenship through naturalization of their parents, or for persons born outside the United States who claim to be United States citizens by virtue of their parents having been United States citizens at the time of such birth, a Certificate of Citizenship issued by the United States Immigration and Naturalization Service is acceptable as documentary evidence of citizenship.

(10) If none of the requirements set forth in subparagraphs (1) through (9) of this paragraph can be met by the applicant, he should make a statement to that effect, and in an attempt to establish citizenship, he may submit for consideration data of the following character:

(i) Report of the Census Bureau showing the earliest record of age or birth available. Request for such information should be addressed to the Director of the Census, Washington, D.C., 20233. In making such request, definite information must be furnished the Census Bureau as to the place when the first census was taken after birth of the applicant, giving the name of the street and number of the house, or the names of the cross streets between which the house was located if residing in a city; or the name of the town, township, precinct, magisterial district, militia district, beat or election district if residing in the country; also the names of parents, or the names of other persons with whom residing on the date specified.

NOTE: A census was taken in the following years: June 1, 1860, 1870, 1880, and 1900; April 15, 1910; January 1, 1920; April 1, 1930; April, 1940, April, 1950 and April, 1960. (Records for 1890 are not available.)

(ii) Affidavits of parents, or relatives; or affidavits by two or more responsible citizens of the United States, stating citizenship; school records; immigration records; or insurance policies.

(d) *Written application.* The Officer in Charge, Marine Inspection shall require all applicants for original license to make written application upon Coast Guard Form CG-866.

(e) *Physical examination.* (1) All applicants for an original license shall be required to pass a physical examination given by a medical officer of the United States Public Health Service and present a certificate executed by this Public Health Service Officer to the Officer in Charge, Marine Inspection. This certificate shall attest to the applicant's acuity of vision, color sense, and general physical condition. In exceptional cases where an applicant would be put to great inconvenience or expense to appear before a medical officer of the United States Public Health Service, the physical examination and certification may be made by another reputable physician.

(2) Epilepsy, insanity, senility, acute venereal disease or neurosyphilis, badly impaired hearing, or other defect that would render the applicant incompetent to perform the ordinary duties of an officer at sea are causes for certification as incompetent.

(3) For an original license as master, mate or pilot, the applicant must have either with or without glasses, at least 20/20 vision in one eye and at least 20/40 in the other. The applicant who wears glasses, however, must also be able to pass a test without glasses of at least 20/40 in one eye and at least 20/70 in the other. The color sense will be tested by means of a pseudo-isochromatic plate test, but any applicant who fails this test will be eligible if he can pass the "Williams" lantern test or equivalent.

(4) Applicants for original engineers' licenses shall be examined only as to their ability to distinguish the colors

red, blue, green, and yellow. No applicant for original license as engineer shall be disqualified for failure to distinguish colors if any of his required experience is served prior to May 1, 1947.

(5) For original license as engineer the applicant must have, either with or without glasses, at least 20/30 vision in one eye and at least 20/50 in the other. The applicant who wears glasses, however, must also be able to pass a test without glasses of at least 20/50 in one eye and at least 20/70 in the other.

(6) Persons serving or intending to serve in the Merchant Marine Service are recommended to take the earliest opportunity of ascertaining, through examination by an ophthalmic surgeon, whether their vision, and color vision where required, is such as to qualify them for service in that profession.

(7) Where an applicant is not possessed of the vision, hearing, or general physical condition necessary, the Officer in Charge, Marine Inspection, after consultation with the Public Health Service physician or other examining physician, may make recommendation to the Commandant for an exception to these requirements, if in his opinion, extenuating circumstances warrant special consideration. Any requests for a decision by the Commandant must be accompanied by all pertinent correspondence, records, and reports. In this connection recommendations from agencies of the Federal Government operating Government vessels, as well as owners and operators of private vessels, made in behalf of their employees, will be given full consideration in arriving at a decision.

(f) *First Aid Certificate.* No candidate for original license shall be examined until he presents a certificate from the United States Public Health Service that he has passed a satisfactory examination based on the contents of "The Ship's Medicine Chest and First Aid at Sea," or other manual arranged for the purpose and having the approval of the United States Public Health Service.

(g) *Experience or training.* (1) All applicants for original licenses shall present to the Officer in Charge, Marine Inspection, letters, discharges, or other official documents certifying the amount and character of their experience and the names of the vessels on which acquired. The Officer in Charge, Marine Inspection, must be satisfied as to the bona fides of all evidence of experience or training presented and may reject any evidence that he has reason to believe is not authentic or which does not sufficiently outline the amount, type and character of service. Coast Guard issued "certificates of seaman's service" and "certificates of discharge" shall be returned to the applicant. The Officer in Charge, Marine Inspection, shall make entry on the application that service represented by these documents has been verified. All other documentary evidence of service or authentic copies thereof shall be filed with the application. No license shall be considered as satisfactory evidence of any qualifying experience required by this paragraph.

(2) No original license shall be issued to any person unless 25 percent of the required experience has been obtained within the 3 years immediately preceding the date of application. Service in the armed forces of the United States shall not be counted in computing the 3 years.

(3) No original license shall be issued to any naturalized citizen on less experience in any grade or capacity than would have been required of a citizen of the United States by birth.

(4) Experience and service acquired on foreign vessels is creditable for establishing eligibility for an original license, subject to evaluation by the Commandant to determine that it is a fair and reasonable equivalent to service acquired on merchant vessels of the United States, with respect to grade, tonnage, horsepower, waters and operating conditions. An applicant who has obtained his qualifying experience on foreign vessels is required to submit satisfactory documentary evidence of such service in the forms prescribed by subparagraph (1) of this paragraph, which certify the amount, character and scope of his service in these respects.

(5) No applicant for a license, who is a naturalized citizen, and who has obtained his experience on foreign vessels, shall be given a grade of license higher than that upon which he has actually served while acting under the authority of a foreign license.

(6) Experience in towed barges fitted with sails and rigging is not considered as sail vessel time.

(h) *Professional examination.* (1) When the amount and character of an applicant's experience is found to be satisfactory and he is eligible in all other respects, the applicant shall be examined in writing by the Officer in Charge, Marine Inspection: *Provided, however,* That upon navigable waters of the United States newly opened to navigation, and where the only pilots obtainable are illiterate Indians or other natives, the fact that such persons can neither read nor write shall not be considered a bar to such Indians or other natives receiving licenses as pilots if they are otherwise qualified therefor.

(2) When the license application of any person has been approved, the Officer in Charge, Marine Inspection, shall give the applicant the required examination as soon as practicable. If applicants for license cannot be examined without material delay by the Officer in Charge, Marine Inspection, of the district in which the application is made, said Officer in Charge, Marine Inspection, shall endeavor, through the Coast Guard District Commander, to arrange for such examination by some other Officer in Charge, Marine Inspection.

(i) *Character check and references.* (1) The Officer in Charge, Marine Inspection, shall require each applicant for an original license to have the written endorsement of the master and that of two other licensed officers of a vessel on which he has served. For a license as engineer or as pilot at least one of the other endorsers shall be the chief engineer or licensed pilot, respectively, of a vessel on which the applicant has served. Where no sea service is required for a license, the applicant may have the endorsement of three reputable persons to whom he is known.

(2) Fingerprint records on FBI Form "Applicant" shall be submitted to the Commandant on each applicant at the same time application for license is made. The application of any person may be rejected by the District Commander or his authorized representative when derogatory information has been brought to his attention which indicates that the applicant's habits of life and character are such as to warrant the belief that he cannot be entrusted with the duties and responsibilities of the station for which he made application. In the event that an applicant is rejected he shall be advised that he may submit a request to the Commandant for a review of his case. No examination shall be given or temporary permit issued in this type case pending the Commandant's authorization.

(3) The fact that an applicant for an original license is on probation as a result of action under R. S. 4450, as amended (46 U. S. C. 239), does not itself make such an applicant ineligible, provided he meets all the requirements for such original license. However, an original license issued under those circumstances will be subject to the same probationary conditions as were imposed against the seaman's certificates or licenses in proceedings under R. S. 4450, as amended. Any such applicant must file an application for license in the usual manner, and the offense for which he was placed on probation will be considered on the merits of the case in determining his fitness to hold the license applied for. Nothing in the regulations in this subchapter, however, shall be construed to permit an applicant to be examined for an original license during any period when a suspension without probation or a revocation imposed pursuant to R. S. 4450, as amended, is effective against his license or certificate.

(Sec. 5, 49 Stat. 1935, as amended, sec. 302, 49 Stat. 1992, as amended; 46 U.S.C. 672a, 1132)

§ 10.02–7 Requirements for raise of grade of license.

(a) *General.* Before any person is issued a license for raise of grade to act on inspected vessels of the United States, he shall personally appear before an Officer in Charge, Marine Inspection, and present satisfactory documentary evidence of his eligibility in respect to the requirements contained herein.

(b) *Surrendering old license.* Upon the issuance of a new license or raise in grade, the applicant shall surrender the old license to the Officer in Charge, Marine Inspection.

(c) *Age requirement.* No license may be raised in grade before the holder thereof shall have reached the age of 21 years.

(d) *Written application.* The Officer in Charge, Marine Inspection, shall, before granting raise of grade of license, require the applicant to make written application upon the Coast Guard Form CG–866.

(e) *Physical requirements.* (1) No license as master, mate, or pilot shall be raised in grade except upon the official certificate of a medical officer of the United States Public Health Service that the color sense of the applicant is normal. Applications for raise in grade of engineer's licenses shall not be subjected to such examination. In exceptional cases where an applicant would be put to great inconvenience or expense to appear before a medical officer of the United States Public Health Service, the physical examination and certification may be made by another reputable physician. The color sense will be tested by means of a pseudoisochromatic plate test, but any applicant who fails this test will be eligible if he can pass the "Williams" lantern test or equivalent. A person failing the pseudoisochromatic plate test shall, if the Public Health Station at which he is undergoing test is not equipped with a lantern, pay his own expenses to journey to such station as is equipped with same.

(2) In the event it is found that an applicant for raise of grade of license obviously suffers from some physical or mental infirmity to a degree that, in the opinion of the Officer in Charge, Marine Inspection, would render him incompetent to perform the ordinary duties of an officer at sea, he shall be required to undergo an examination by a medical officer of the Public Health Service to determine his competency in such respects. Nothing herein contained shall debar an applicant who has lost the sight of one eye from securing a raise of grade of his license: *Provided*, He is qualified in all other respects: *And provided*, That his vision in his one eye passes the test required for the better eye of an applicant possessed of both eyes. If the applicant subsequently produces a certificate from the Public Health Service to the effect that his condition has improved to a satisfactory degree, or is normal, he shall be qualified in this respect.

(f) *Experience or training.* (1) Applicants for raise of grade of licenses are charged with establishing to the satisfaction of the Coast Guard that they possess all of the qualifications necessary, such as age, experience, character, and citizenship before they are entitled to a raise of grade of license.

(2) Applicants for raise of grade of license shall present to the Officer in Charge, Marine Inspection, letters, discharges, or other official documents certifying to the amount and character of their experience and the names of the vessels on which acquired. Coast Guard issued "certificates of seaman's service" and "certificates of discharge" shall be returned to the applicant. The Officer in Charge, Marine Inspection, shall make entry on the application that service represented by these documents has been verified. All other documentary evidence of service or authentic copies thereof shall be filed with the application.

(3) No raise of grade of license shall be granted to any applicant unless 25 percent of the required sea service shall have been served within 3 years immediately preceding the date of application. Service in the armed forces of the United States shall not be counted in computing the 3 years.

(4) No sea service acquired prior to the issuance of the license held shall be accepted as any part of the service required for raise in grade.

(5) No license for raise of grade shall be issued to any naturalized citizen on less experience in any grade than would have been required of a citizen of the United States by birth.

(6) Experience and service acquired on foreign vessels while holding a valid U. S. Merchant Marine Officer's license is creditable for establishing eligibility for a raise in grade, subject to evaluation by the Commandant to determine that it is a fair and reasonable equivalent to service acquired on merchant vessels of the United States, with respect to grade, tonnage, horsepower, waters and operating conditions. An applicant who has obtained his qualifying experience on foreign vessels is required to submit satisfactory documentary evidence of such service in the forms prescribed by subparagraph (2) of this paragraph which certify the amount, character and scope of his service in these respects.

(7) The fact that an applicant for a raise in grade of license is on probation as a result of action under R. S. 4450, as amended (46 U. S. C. 239), does not itself make such an applicant ineligible, provided he meets all the requirements for such raise in grade. However, a raise in grade of license issued under these circumstances will be subject to the same probationary conditions as were imposed against the seaman's certificates or licenses in proceedings under R. S. 4450, as amended. Any such applicant must file an application for license in the usual manner, and the offense for which he was placed on probation will be considered on the merits of the case in determining his fitness to hold the license applied for. Nothing in the regulations in this part, however, shall be construed to permit an applicant to be examined for a raise in grade of license during any period when a suspension without probation or a revocation imposed pursuant to R. S. 4450, as amended, is effective against his license or certificate.

(g) *Professional examination.* (1) When the amount and character of an applicant's experience for raise of grade is found to be satisfactory and he is eligible in all other respects, he shall be examined in writing by an Officer in Charge, Marine Inspection: *Provided, however*, That upon waters of the United States newly opened to navigation, and where the only pilots obtainable are illiterate Indians or other natives, the fact that such persons can neither read nor write shall not be considered a bar to such Indians or other natives receiving a raise in grade of license as pilot if they are otherwise qualified therefor.

(Interpret or apply R.S. 4447, as amended, sec. 5, 49 Stat. 1935, as amended, sec. 302, 49 Stat. 1992, as amended, 46 U.S.C. 233, 672a, 1132)

§ 10.02–9 Requirements for renewal of license.

(a) *Duty of applicants.* Applicants for renewals of licenses are charged with the duty of establishing to the satisfaction of the Coast Guard that they possess all of the qualifications necessary before they shall be issued a renewal of license.

(1) *Written application.* The Officer in Charge, Marine Inspection, shall, before granting renewal of a license, require the applicant to make written application on Coast Guard Form CG–3479.

(b) *Application for renewal.* The applicant for renewal shall appear in person before an Officer in Charge, Marine Inspection, except as provided in paragraph (g) of this section.

(c) *Fitness.* No license shall be renewed if title has been forfeited or facts which would render a renewal improper have come to the attention of the Coast Guard.

(d) *Period of grace.* (1) A license shall be renewed within 12 months after the date of expiration as shown on the license held, except when applicant's license has expired beyond the 12 month period of grace during the time of the holder's service with the Armed Forces or the Merchant Marine and there was no reasonable opportunity for renewal. The period of such service following the date of expiration as shown on the license shall be added to the 12 month period of grace.

(2) No license shall be renewed more than 90 days in advance of the date of expiration thereof, unless there are extraordinary circumstances that justify a renewal beforehand, in which case the reasons therefor must appear in detail upon the records of the Officer in Charge, Marine Inspection, renewing the license.

(e) *Masters', mates', or pilots' licenses.* (1) Every Officer in Charge, Marine Inspection, shall, before renewing an existing license to a master, mate, or pilot who has served under the authority of his license within the three years next preceding the date of application for renewal, or who has been employed in a position closely related to the operation of vessels during the same three year period, require that such licensed officer present an affidavit that he has read within the three months next preceding the date of application the Rules of the Road applicable to the waters for which he is licensed and demonstrate his knowledge of the application of the Rules of the Road.

(2) Every Officer in Charge, Marine Inspection, shall, before renewing an existing license to a master, mate, or pilot who has not served under the authority of his license within the three years next preceding the date of application for renewal, or who has not been employed in a position closely related to the operation of vessels during the same three year period, satisfy himself that such licensed officer is thoroughly familiar with the Rules of the Road applicable to the waters for which he is licensed. A written examination may be required for this purpose, or the applicant may be examined orally and a summary of the oral examination placed in the officer's

license file. In the event a candidate fails the examination, the provisions of § 10.02–19 shall apply, except in the event of subsequent failures the applicant may be re-examined after a lapse of one month from the date of the last failure.

(f) *Physical requirements.* (1) No license as master, mate, or pilot shall be renewed except upon the official certificate of a medical officer of the United States Public Health Service that the color sense of the applicant is normal. Applicants for renewal of license as engineer shall not be subject to examination as to ability to distinguish colors.

(2) The color sense will be tested by means of a pseudo-isochromatic plate test, but any applicant who fails this test will be eligible if he can pass the "Williams" lantern test or equivalent. A person failing the pseudoisochromatic plate test shall, if the Public Health Service Station at which he is undergoing test is not equipped with a lantern, pay his own expenses to travel to such station as is equipped with same.

(3) In the event an applicant for renewal of license as master, mate, or pilot is pronounced color blind, the Officer in Charge, Marine Inspection, may grant him a license limited to service during daylight only.

(4) In the event it is found that an applicant for renewal of license obviously suffers from some physical or mental infirmity to a degree that, in the opinion of the Officer in Charge, Marine Inspection, would render him incompetent to perform the ordinary duties of an officer at sea, the applicant shall be required to undergo an examination by a medical officer of the Public Health Service to determine his competency. If the applicant subsequently produces a certificate from the Public Health Service to the effect that his condition has improved to a satisfactory degree, or is normal, he shall be qualified in this respect.

(5) Nothing contained in this section shall debar an applicant who has lost the sight of one eye from securing a renewal of his license, provided he is qualified in all other respects, and the vision in his one eye passes the test required for the better eye of an applicant possessed of both eyes.

(6) In exceptional cases where an applicant would be put to great inconvenience or expense to appear before a medical officer of the United States Public Health Service, the physical examination or certification may be made by another reputable physician.

(g) *Renewal by mail.* Where an applicant for renewal would be put to great inconvenience or expense to appear in person before an Officer in Charge, Marine Inspection, or is engaged in a service that necessitates his continuous absence from the United States, his existing license may be renewed by forwarding the following documents to the Officer in Charge, Marine Inspection, of the office which issued the license to be renewed:

(1) A letter of transmittal indicating reasons for not appearing in person and stating to the best of his knowledge no physical incapacity exists, together with a properly executed application on Coast Guard Form CG–3479;

(2) The oath of office on the form prescribed by the Coast Guard which has been duly executed before a person authorized to administer oaths;

(3) The license to be renewed; and,

(4) In the case of the renewal of a master's, mate's, or pilot's license:

(i) Certification by a United States Public Health Service Medical Officer or other reputable physician that color sense is normal; and,

(ii) Documentary evidence of service under authority of license within the three years next preceding the date of application or evidence of employment in a position closely related to the operation of vessels within the same three year period, together with an affidavit that the applicant has read within the three months next preceding the date of application the Rules of the Road applicable to the waters for which he is licensed and demonstration of his knowledge of the application of the Rules of the Road.

(h) *Reissue of expired license.* (1) Whenever an applicant shall apply for renewal of his license for the same grade, after 12 months after date of its expiration, he shall be required to pass an examination for the same grade of license, of such length and scope as will, in the judgment of the Officer in Charge, Marine Inspection, be sufficient to demonstrate adequately the continued professional knowledge of the examinee, except no professional examination will be required provided the license expired during the time of the holder's service with the armed forces or the merchant marine, and there was no reasonable opportunity for renewal. The Officer in Charge, Marine Inspection may require a written examination for this purpose.

(2) The renewed license shall receive the next higher number of issue of present grade and for the number of issue of all grades.

(R.S. 4447, as amended, 46 U.S.C. 233, sec. 5, 49 Stat. 1935, sec. 302, 49 Stat. 1992; 46 U.S.C. 672a, 1132)

§ 10.02–13 Sea service as a member of the Armed Forces of the United States and on vessels owned by the United States as qualifying experience.

(a) Sea service as a member of the Armed Forces of the United States will be accepted as qualifying experience for an original, raise of grade, or extension of route of license. Such service will be subject to evaluation by the Commandant to determine its equivalence to sea service required on merchant vessels and to determine the appropriate grade, class, and limit of license for which the applicant is eligible. The regulations governing the licensing of merchant marine personnel which are in effect on the date an applicant presents himself for examination shall be applicable in all cases.

(b) When any person who has served in a civilian capacity as commanding officer, master, mate, engineer, or pilot, etc., of any vessel owned and operated by the United States, in any service, in which a license as master, mate, engineer, or pilot was not required at the time of such service applies for an examination for license, the Officer in Charge, Marine Inspection, shall forward the application, together with his comments, to the Commandant for evaluation.

§ 10.02–15 Lifting of limitations.

(a) If any Officer in Charge, Marine Inspection, is satisfied by the documentary evidence submitted that an applicant is entitled by experience and knowledge to an increase in the scope of his license, he may change any limitations which he may have previously placed upon the license.

(b) No Officer in Charge, Marine Inspection, may change on any license a limitation which he did not place thereon before full information regarding the reason for the limitation is obtained from the Officer in Charge, Marine Inspection, responsible for the same and the applicant has made up any deficiency in the experience required.

(c) No limitation on any license may be changed before the applicant has made up any deficiency in the experience prescribed for the license desired and passed the necessary examination.

§ 10.02–19 Reexaminations and refusal of licenses.

(a) Any applicant for license or indorsement who has been duly examined and refused may come before the same Officer in Charge, Marine Inspection, for reexamination at any time thereafter that may be fixed by such Officer in Charge, Marine Inspection, but such time shall not be less than 1 month from the date of his last failure. In the case of another failure, he will not be reexamined until after a lapse of at least 6 months from date of last failure.

(b) A candidate who has been duly examined and refused a license by an Officer in Charge, Marine Inspection, shall not be examined by any other Officer in Charge, Marine Inspection, until 1 year has elapsed from the date of the last refusal without the sanction of the Officer in Charge, Marine Inspection, that refused the applicant.

(c) If the Officers in Charge, Marine Inspection, refuse to grant an applicant the license applied for, they shall furnish him a statement setting forth the cause of their refusal.

§ 10.02–21 Laws, general rules and regulations, and Rules of the Road to be furnished licensed officers.

(a) Every master, mate, pilot, and engineer of vessels, when receiving an original license, a renewed license, or a raise of grade of license, shall be furnished at his request with a copy of the "Laws Governing Marine Inspection" and a copy of each of the "Rules and Regulations for Vessel Inspection" distributed by the Coast Guard pertinent to the license issued.

(b) Every master, mate, and pilot of vessels and motorboat operator, when receiving an original license, a renewed license, or a raise of grade of license,

shall be furnished at his request with a copy of the "Rules of the Road" applicable to the waters for which his license has been issued.

§ 10.02–23 Issuance of duplicate license.

(a) Whenever a person to whom a license has been issued loses his license, he shall report such loss to an Officer in Charge, Marine Inspection, who shall issue a duplicate license after receiving from such person a properly executed affidavit giving satisfactory evidence of such loss, and a record of the license from the Marine Inspection Office where it was issued. Such license shall be issued as a duplicate by the addition of the following typewritten indorsement, "This license replaces License Number ____ issued at _____ on the above date," as well as the port and date of the duplicate issue. The duplicate license, issued for the unexpired term, shall have the same force and effect as the lost license.

(b) When a person reports the loss of his license, or when it is discovered that any license or license form has been stolen from a Marine Inspection Office or when such lost or stolen licenses are recovered, the Officer in Charge, Marine Inspection, shall immediately report the loss, theft, or recovery to the Commandant giving a description of the license and all facts incident to its loss, theft, or recovery.

§ 10.02–25 Parting with license.

If the holder of any license granted to a master, mate, engineer, or pilot, voluntarily parts with it or places it beyond his personal control by pledging or depositing it with any other person for any purpose, he may be proceeded against in accordance with the provisions of R. S. 4450, as amended, looking to a suspension or revocation of his license.

§ 10.02–29 Suspension and revocation of licenses.

(a) When the license of any master, mate, engineer, or pilot is revoked such license expires with such revocation and any license of the same type subsequently granted to such person shall be considered in the light of an original license except as to number of issue.

(b) No person whose license has been suspended or revoked shall be issued another license except upon approval of the Commandant.

(c) When a license which is about to expire is suspended, the renewal of such license may be withheld until the expiration of the period of suspension.

(R.S. 4450, as amended, sec. 2, 68 Stat. 484; 46 U.S.C. 239, 239b. Treasury Department Order 167–9, August 3, 1954, 19 F.R. 5195)

§ 10.02–33 Right of appeal.

Whenever any person directly interested in or affected by any decision or action of any Officer in Charge, Marine Inspection, shall feel aggrieved by such decision or action with respect to the issuance of a license or a certificate, he may appeal therefrom to the District Coast Guard Commander having jurisdiction. A like appeal shall be allowed from any decision or action of the District Coast Guard Commander to the Commandant, whose action shall be final. Such appeals shall be made in writing within 30 days after the date of decision or action appealed from. Pending the determination of the appeal the decision of the Officer in Charge, Marine Inspection, shall remain in effect.

Subpart 10.05—Professional Requirments for Deck Officers' Licenses (Inspected Vessels)

AUTHORITY: The provisions of this Subpart 10.05 interpret or apply R.S. 4417a, as amended, 4426, as amended, 4427, as amended, 4438, as amended, 4438a, as amended, 4439, as amended, 4440, as amended, 4442, as amended, 4443, as amended, 4445, as amended, sec. 1, 34 Stat. 1411, as amended, secs. 1, 2, 49 Stat. 1544, 1545, as amended, sec. 3, 70 Stat. 152, and sec. 3, 68 Stat. 675; 46 U.S.C. 391a, 404, 405, 224, 224a, 226, 228, 214, 230, 231, 233, 225, 237, 367, 390b, 50 U.S.C. 198. Treasury Department Order 167–14, November 26, 1954, 19 F.R. 8026; 167–20, June 18, 1956, 21 F.R. 4894, unless otherwise noted.

§ 10.05–1 Ocean licenses qualifying for all waters.

Any license issued for service as master or mate on ocean vessels shall qualify the licensee to serve in the same grade on any waters subject to the limitations of the license and without additional indorsement other than for pilot routes as may be required on the particular waters.

§ 10.05–3 Master of ocean steam or motor vessels.

(a) The minimum service required to qualify an applicant for license as master of ocean steam or motor vessels is:

(1) One year's service as chief mate of ocean steam or motor vessels of 1,000 gross tons or over; or,

(2) One year's service as chief mate of coastwise steam or motor vessels of 2,000 gross tons or over; or,

(3) Two years' service as second mate of ocean steam or motor vessels of 1,000 gross tons or over while holding a license as chief mate of such vessels; or,

(4) Two years' service as second mate of coastwise steam or motor vessels of 2,000 gross tons or over while holding a license as chief mate of such vessels; or,

(5) One year's service as master of coastwise steam or motor vessels of 2,000 gross tons or over; or,

(6) Two years' service as master of ocean or coastwise sail vessels of 700 gross tons or over, for license as master of freight or towing steam or motor vessels of not more than 3,000 gross tons; or,

(7) Three years' service as master of steam or motor vessels of 4,000 gross tons or over, except ferry vessels, on the Great Lakes, together with 1 year's service as second mate of ocean steam or motor vessels of 1,000 gross tons or over; or,

(8) Two years' service as licensed master of ocean or coastwise steam or motor vessels, or as licensed ocean operator of inspected, mechanically propelled passenger-carrying vessels operating on limited ocean or coastwise routes, for a license as master of ocean steam or motor passenger vessels not to exceed 300 gross tons.

§ 10.05–5 Master of coastwise steam or motor vessels.

(a) The minimum service required to qualify an applicant for license as master of coastwise steam or motor vessels is:

(1) One year's service as chief mate of ocean or coastwise steam or motor vessels; or,

(2) Two years' service as second mate of ocean or coastwise steam or motor vessels while holding a license as chief mate of ocean or coastwise steam or motor vessels; or,

(3) Two years' service as master of Great Lakes or lake, bay or sound steam or motor vessels of 500 gross tons or over, except ferry vessels, together with 6 months' service as chief mate or 12 months' service as second mate of ocean or coastwise steam or motor vessels, while holding license as master of such Great Lakes or lake, bay or sound vessels; or,

(4) Five years' service on ocean or coastwise sail vessels of 200 gross tons or over, 2 years of which service shall have been as master of such vessels, for license as master of coastwise freight and towing vessels of not over 750 gross tons; or,

(5) One year's service as a licensed master of ocean or coastwise sail vessels of 700 gross tons or over for a lisense as master of coastwise freight or towing vessels of not more than 3,000 gross tons; or,

(6) Two years' service as master or first-class pilot of Great Lakes or lake, bay or sound towing steam or motor vessels of 150 gross tons or over, for license as master of coastwise towing vessels of 750 gross tons or under; or,

(7) Two years' service as master of steam vessels of 1,000 gross tons or over, except ferry vessels, on the Great Lakes and other lakes, bays, or sounds, for license as master of coastwise vessels on routes not exceeding 300 miles; or,

(8) Two years' service as a licensed master of steam or motor vessels of 250 gross tons or over, engaged in the ocean or coastwise fisheries, for license as master of coastwise freight or towing vessels of not more than 750 gross tons; or,

(9) One year's service as licensed master of ocean or coastwise steam or motor vessels, or as licensed ocean operator of inspected, mechanically propelled passenger-carrying vessels operating on limited ocean or coastwise routes, for a license as master of coastwise steam or motor passenger vessels, not to exceed 300 gross tons and limited to the Atlantic, Gulf of Mexico or Pacific Coast of the United States, according to the documented qualifying experience of the applicant.

(b) The minimum service required to qualify an applicant for a license as master of motor vessels of not more than 300 gross tons, operated in connection with the offshore mineral and oil industries, limited to a stated distance offshore on the continental shelf of the Atlantic, Gulf or Pacific Coast of the United States, as determined by the Commander of the District in which the license is issued, is:

(1) One year as a licensed mate of mineral or oil industry vessels; or,

(2) One year as a licensed master or first-class pilot of inland steam or motor vessels, plus 1 year in the deck department of coastwise vessels or mineral or oil industry vessels; or,

(3) Two years' service as a licensed master of ocean or coastwise uninspected vessels; or,

(4) Three years' service in the deck department of ocean or coastwise vessels of which at least one year shall have been as master or person in charge of vessels of at least 50 gross tons. If the required service as master or person in charge has been on vessels of more than 15 and less than 50 gross tons, the service may be accepted as qualifying experience for a license as master of vessels of not more than 100 gross tons.

§ 10.05–7 Master of ocean or coastwise sail vessels.

(a) The minimum service required for a license as master of ocean or coastwise sail vessels of 100 gross tons and over is listed in this paragraph. In order to be eligible for an unlimited license, an applicant must have acquired all of his qualifying service on vessels of 500 gross tons or over.

(1) One year's service as a licensed master of ocean or coastwise uninspected sail vessels; or,

(2) Two years' service as master of ocean or coastwise sail vessels of 100 gross tons or over; or,

(3) One year's service as a licensed master of ocean or coastwise auxiliary sail vessels; or,

(4) Two years' service as a licensed mate of ocean or coastwise uninspected sail vessels; or,

(5) Two years' service as a licensed ocean operator of ocean or coastwise sail vessels carrying passengers; or,

(6) Five years' service in the deck department of ocean or coastwise sail vessels, of which at least 1 year shall have been as mate.

(b) An applicant who submits satisfactory documentary evidence that he has served as master of ocean or coastwise sail vessels of 100 gross tons or over for a period of at least 1 year, prior to June 1, 1958, shall be eligible without professional examination for a license as master of ocean or coastwise sail vessels of 100 to 700 gross tons, commensurate with his experience: *Provided*, That such applicant for a license under the provisions of this paragraph shall fulfill all requirements, other than professional examination, for an original license, including citizenship, physical examination, character and U. S. Public Health Service First Aid Certificate: *And provided further*, That 6 months of the required 1 year of experience shall have been within the 3 years immediately preceding the date of application. Application for the issuance of licenses under the provisions of this paragraph must be filed within a period of 1 year after June 1, 1958. However, if the applicant can show that because of active military service, he was unable to obtain 6 months' service within the past 3 years or to file application within the 1 year period provided, the actual time spent in military service shall not be counted in computing either the 3-year period or the 1-year period specified in this paragraph.

§ 10.05–9 Master of ocean or coastwise steam or motor yachts.

The minimum service required to qualify an applicant for license as master of ocean or coastwise steam or motor yachts requiring licensed officers is 3 years' service in the deck department on ocean or coastwise steam, motor, or sailing yachts, of over 100 gross tons.

§ 10.05–11 Master, mate, or pilot of steam or motor vessels operating under special conditions.

(a) This section shall apply to every applicant for a license as master, mate, or pilot of steam pilotboats or seagoing motor pilotboats of 300 gross tons or over; or of steam vessels navigating the waters of the whaling grounds in the Alaskan Seas; or of steam vessels engaged exclusively in the business of whale fishing; or of steam vessels engaged in the Atlantic, Pacific, or Gulf Coast fisheries; or of steam or sail vessels navigating exclusively between ports in the Hawaiian Islands; or of steam or sail vessels or seagoing motor vessels of 300 gross tons or over navigating exclusively between ports of the Island of Puerto Rico.

(b) For original license as master, at least 3 years' experience in the deck department of such vessels is required.

(c) For original license as mate, at least 2 years' experience in the deck department of such vessels is required.

(d) Any person who has had at least 5 years' experience on sail vessels licensed in the fisheries of the United States, 2 years of which have been as master or mate of such sailing vessels, shall be eligible for a license as master or mate of steam fishing vessels to be employed exclusively in the Atlantic, Pacific, and Gulf coast fisheries.

(e) Any applicant for original license who has had 3 years' experience in the deck department on steam or motor pilot boats or who has had 2 years' experience in the deck department on steam or motor pilot boats and 1 year's experience on sail pilot boats, shall be eligible for license as mate of steam or motor pilot boats of 300 gross tons or over.

(f) Any master's or mate's license issued under this section may be endorsed as pilot on such inland waters on the coasts stated in his license as the appropriate Officer in Charge, Marine Inspection, may find the holder qualified to act on as pilot.

(g) An applicant for a master's license of seagoing vessels propelled by internal combustion engines, navigating exclusively between ports in the Hawaiian Islands, shall submit with his application statements duly executed and certified by reputable citizens qualified to judge the character, trustworthiness, and ability of the applicant.

(h) The Officer in Charge, Marine Inspection, shall make a diligent inquiry as to the applicant's character and merits, and if satisfied by the oral examination or practical demonstration and the proof of requisite knowledge and skill offered, the Officer in Charge, Marine Inspection, shall issue the license. No certificate from the United States Public Health Service based upon the subject of ship sanitation and first aid shall be required of such an applicant.

§ 10.05–13 Master of Great Lakes steam and motor vessels.

(a) The minimum service required to qualify an applicant for a license as master is listed in this paragraph. In order to be eligible for an unlimited license, an applicant must have acquired his service on vessels of 4,000 gross tons or over, except as specified in this section.

(1) One year's service as first class pilot while acting in the capacity of first mate on Great Lakes steam or motor vessels; or,

(2) Two years' service as first class pilot while acting in the capacity of second mate on Great Lakes steam or motor vessels; or,

(3) Four years' service as first class pilot on Great Lakes steam or motor vessels, one year of which shall have been while acting in the capacity of second mate; or,

(4) One year's service as master of Great Lakes steam or motor vessels of 150 gross tons or under while acting under the authority of a first class pilot's license, for a license as master of Great Lakes steam and motor vessels of not over 1,000 gross tons; or,

(5) One year's service as master and/or first class pilot on lakes, bays and sounds steam or motor towing vessels, together with 1 year of service as first class pilot on Great Lakes vessels of over 100 gross tons, for a license as master of Great Lakes towing vessels of not over 750 gross tons.

§ 10.05–15 Master of bays, sounds, and lakes other than the Great Lakes, steam and motor vessels.

(a) The minimum service required to qualify an applicant for license as master of steam and motor vessels on bays, sounds and lakes other than the Great Lakes is:

(1) One year's service as first-class pilot of steam and motor vessels on bays, sounds and lakes other than the Great Lakes; or,

(2) One year's service as mate of steam and motor vessels on bays, sounds and lakes other than the Great Lakes; or,

(3) One year's service as master of steam or motor vessels of 150 gross tons or under on bays, sounds and lakes other than the Great Lakes, while acting under the authority of a first-class pilot's license, for a license as master of bays, sounds and lakes other than the Great Lakes, steam or motor vessels of a tonnage commensurate with the experience of the applicant, but of not more than 500 gross tons; or,

(4) Two years' service in the deck department of steam or motor vessels on bays, sounds and lakes other than the Great Lakes, while holding a license as first-class pilot for bays, sounds and lakes other than the Great Lakes, as quartermaster or wheelsman for a license as master of steam and motor freight and towing vessels on bays, sounds and lakes other than the Great Lakes, limited to a gross tonnage commensurate with the experience of the applicant, but not more than 500 gross tons.

§ 10.05–17 Master of river steam or motor vessels.

The minimum service required to qualify an applicant for a license as master of steam or motor vessels navigating rivers exclusively is at least 3 years' service in the deck department of steam or motor vessels: *Provided*, That, 1 year of such service shall have been as licensed mate or pilot of steam or motor vessels, and, 1 year shall have been on river steam or motor vessels.

§ 10.05–19 Master of ferry steam or motor vessels.

(a) The minimum service required to qualify an applicant for license as master of ferry steam or motor vessels on either the Great Lakes, other lakes, bays, and sounds, or rivers is:

(1) One year's service as first-class pilot; or,

(2) Two years' service as wheelsman or quartermaster while holding a first-class pilot's license; or,

(3) Two years' service in charge of a steam or motor vessel of 150 gross tons or under while acting under the authority of a pilot's license.

§ 10.05–21 Master or pilot of steam yachts.

The minimum service required to qualify an applicant for license as master or pilot of steam yachts on either the Great Lakes, other lakes, bays, and sounds, or rivers is 3 years' service in the deck department on board Great Lakes, other lakes, bays, and sounds, or river steam, motor, or sailing yachts.

§ 10.05–23 Master of passenger barges.

The minimum service required to qualify an applicant for license as master of barges carrying passengers on either the Great Lakes, other lakes, bays, and sounds, or rivers is 3 years' service in the deck department of such vessels.

§ 10.05–25 Chief mate of ocean steam or motor vessels.

(a) The minimum service required to qualify an applicant for license as chief mate of ocean steam or motor vessels is:

(1) One year's service as second mate of ocean steam or motor vessels of 1,000 gross tons or over; or,

(2) One year's service as second mate of coastwise steam or motor vessels of 2,000 gross tons or over; or,

(3) Two years' service as officer in charge of a deck watch on ocean steam or motor vessels of 1,000 gross tons or over while holding a license as second mate of such vessels; or,

(4) Two years' service as officer in charge of a deck watch on coastwise steam or motor vessels of 2,000 gross tons or over while holding a license as second mate of such vessels; or,

(5) Two years' service as master of Great Lakes or other lakes, bay, or sound steam or motor vessels of 1,000 gross tons or over except ferry vessels, together with 1 year's service as officer in charge of a deck watch on ocean steam or motor vessels of 1,000 gross tons or over, or together with 1 year of such service on coastwise steam or motor vessels of 2,000 gross tons or over; or,

(6) Five years' service in the deck department of ocean or coastwise sail vessels of 200 gross tons or over, 2 years of such service shall have been as master of such vessels, for license as chief mate of ocean freight or towing vessels of not more than 3,000 gross tons; or,

(7) One year's service as master of any class of ocean steam or motor vessels of more than 250 gross tons for license as chief mate of ocean freight or towing vessels of not more than 1,500 gross tons; or,

(8) One year's service as mate of inspected ocean or coastwise vessels while holding an unlimited license as 3rd mate of ocean steam or motor vessels for a license as chief mate of ocean vessels of less than 1600 gross tons.

§ 10.05–27 Chief mate of coastwise steam or motor vessels.

(a) The minimum service required to qualify an applicant for license as chief mate of coastwise steam or motor vessels is:

(1) One year's service as second mate of ocean or coastwise steam or motor vessels of 1,000 gross tons or over; or,

(2) Two years' service as officer in charge of a deck watch on ocean or coastwise steam or motor vessels of 1,000 gross tons or over while holding license as second mate of ocean or coastwise steam or motor vessels; or,

(3) One year's service as master or first-class pilot of Great Lakes or other lakes, bay, or sound steam or motor vessels of 500 gross tons or over, except ferry vessels, together with 1 year's service as officer in charge of a deck watch on ocean or coastwise steam or motor vessels of 1,000 gross tons or over, while holding license as such master or first-class pilot; or,

(4) Two years' service as master or first-class pilot of Great Lakes or other lakes, bay, or sound towing vessels for license as chief mate of coastwise towing vessels of 750 gross tons or under; or,

(5) One year's service as a licensed master or 2 years' service as a licensed mate on ocean or coastwise steam or motor vessels of 250 gross tons or over engaged in the ocean or coastwise fisheries, for license as chief mate of coastwise freight or towing vessels of 1,000 gross tons or under; or,

(6) Five years' service in the deck department of any ocean or coastwise sail vessel of 100 gross tons or over, 2 years of such service shall have been as master of such vessels, for license as chief mate of freight or towing vessels of 1,000 gross tons or under; or,

(7) Two years' service as first-class pilot, or 2 years' combined service as master and first-class pilot of steam or motor vessels of 1,000 gross tons or over, except ferry vessels, on the Great Lakes and other lakes, bays, and sounds, for license as chief mate of coastwise vessels on routes not exceeding 300 miles; or,

(8) Three years' service in the deck department of ocean or coastwise steam or motor vessels for license as chief mate of coastwise steam or motor vessels of not more than 500 gross tons.

§ 10.05–28 Mate of motor vessels engaged in offshore mineral and oil industries.

(a) The minimum service required to qualify an applicant for a license as mate of motor vessels of not more than 300 gross tons, operated in connection with the offshore mineral and oil industries, limited to a stated distance offshore on the continental shelf of the Atlantic, Gulf or Pacific Coast of the United States, as determined by the Commander of the District in which the license is issued, is:

(1) Two years' service as a licensed officer in charge of a deck watch on mineral or oil industry vessels, or

(2) One year's service as master or first-class pilot of inland steam or motor vessels plus six months in the deck department of coastwise vessels or mineral or oil industry vessels, or

(3) One year's service as a licensed master or two years' service as a licensed mate of ocean or coastwise uninspected vessels, or

(4) Three years' service in the deck department of ocean or coastwise steam or motor vessels, including mineral and oil industry vessels.

§ 10.05–29 Second mate of ocean steam or motor vessels.

(a) The minimum service required to qualify an applicant for license as second mate of ocean steam or motor vessels is listed in this paragraph. In order to be eligible for an unlimited ocean license, an applicant must have obtained his service on ocean or coastwise vessels of 1,000 gross tons or over.

(1) One year's service as officer in charge of a deck watch on ocean or coastwise steam or motor vessels while holding a license as third mate; or,

(2) Six months' service as second mate of coastwise steam or motor vessels; or,

(3) Five years' service in the deck department of ocean or coastwise steam or motor vessels of 1,000 gross tons or over, 2 years of which shall have been as boatswain or quartermaster while holding a certificate as able seaman; or,

(4) One year's service as first-class pilot of steam or motor vessels of 4,000 gross tons or over, except ferry vessels, on the Great Lakes or other lakes, bays, or sounds, together with 6 months' service in the deck department of ocean steam or motor vessels of 1,000 gross tons or over, while holding a license as such first-class pilot; or,

(5) Two years' service as assistant (junior officer of the watch) to the officer in charge of the watch on ocean steam or motor vessels, while holding a license as third mate of such vessels; or,

(6) Four years' service in the deck department of ocean or coastwise sail vessels of 200 gross tons or over, 1 year of such service shall have been as second mate of such sail vessels.

§ 10.05–31 Second mate of coastwise steam or motor vessels.

(a) The minimum service required to qualify an applicant for license as second mate of coastwise steam or motor vessels is:

(1) One year's service as officer in charge of a deck watch on ocean or coastwise steam or motor vessels while holding a license as third mate; or,

(2) Five years' service in the deck department of ocean or coastwise steam or motor vessels, 2 years of which shall have been as boatswain or quartermaster; or,

(3) One year's service as first-class pilot of steam or motor vessels of 2,500 gross tons or over, except ferry vessels, on the Great Lakes or other lakes, bays, or sounds, together with 6 months' service in the deck department of ocean or coastwise steam or motor vessels of 1,000 gross tons or over, while holding a license as such first-class pilot; or,

(4) Two years' service as assistant (junior officer of the watch) to the officer in charge of the watch on ocean steam or motor vessels, while holding a license as third mate of such vessels; or,

(5) One year's service as a licensed mate on ocean or coastwise steam or motor vessels of 150 gross tons or over engaged in the fisheries, for license as second mate of towing vessels.

§ 10.05–33 Third mate of ocean steam or motor vessels.

(a) The minimum service or training required to qualify an applicant for license as third mate of ocean steam or motor vessels is listed in this paragraph. In order to be eligible for an unlimited ocean license, an applicant must have obtained his service on ocean or coastwise vessels of 1,000 gross tons or over.

(1) Three years' service in the deck department of ocean or coastwise steam or motor vessels, 6 months of which shall have been as able seaman, boatswain, or quartermaster while holding a certificate as able seaman; or,

(2) Six months' service as third mate of coastwise steam or motor vessels; or,

(3) Graduation from:

(i) The U. S. Merchant Marine Academy (deck);

(ii) The deck class of a nautical schoolship approved by and conducted under rules prescribed by the Commandant and listed in Part 166 of Subchapter R (Nautical Schools) of this chapter;

(iii) The U. S. Naval Academy; or,

(iv) The U. S. Coast Guard Academy; or,

(4) Satisfactory completion of the prescribed course (deck) at a U. S. Maritime Service or other Government operated training school, approved by the Commandant, may be accepted as the equivalent of sea service up to a maximum of 4 months: *Provided*, The applicant has obtained the additional qualifying experience prior to enrollment; or,

(5) One year's service as second-class pilot of steam or motor vessels of 4,000 gross tons or over, except ferry vessels, on the Great Lakes or other lakes, bays, or sounds, together with 6 months' service in the deck department of ocean steam or motor vessels of 1,000 gross tons or over, while holding a license as such second-class pilot; or,

(6) Three years' service in the deck department of steam or motor vessels on the Great Lakes, other lakes, bays, or sounds, or rivers, together with 1 year's service in the deck department of ocean steam or motor vessels, 6 months of which shall have been as able seaman, boastwain, or quartermaster while holding a certificate as able seaman; or,

(7) Three years' service in the deck department of steam or motor vessels of 100 gross tons or over engaged in the ocean or coastwise fisheries, together with 6 months' service as able seaman, boatswain, or quartermaster on ocean steam or motor vessels, while holding a certificate as able seaman.

§ 10.05–35 Third mate of coastwise steam or motor vessels.

(a) The minimum service or training required to qualify an applicant for license as third mate of coastwise steam or motor vessels is:

(1) Three years' service in the deck department of ocean or coastwise steam or motor vessels, 6 months of which shall have been as able seaman; or,

(2) One year's service as second-class pilot of steam or motor vessels of 2,500 gross tons or over, except ferry vessels, on the Great Lakes or other lakes, bays, or sounds, together with 6 months' service in the deck department of ocean or coastwise steam or motor vessels of 1,000 gross tons or over, while holding a license as such second-class pilot; or,

(3) Two years' service in the deck department of steam or motor vessels on the Great Lakes or other lakes, bays, or sounds, together with 2 years' service in the deck department of ocean or coastwise steam or motor vessels, 6 months of which shall have been as able seaman; or,

(4) Two years' service in the deck department of steam or motor vessels of 100 gross tons or over engaged in the ocean or coastwise fisheries, or any sail vessel of 100 gross tons or over, together with 1 year's service in the deck department of ocean or coastwise steam or motor vessels, 6 months of which shall have been as able seaman; or,

(5) Three years' service in the deck department of ocean or coastwise steam, motor, or sail vessels of less than 100 gross tons, together with 1 year's service in the deck department of ocean or coastwise steam or motor vessels, 6 months of which shall have been as able seaman.

§ 10.05–37 Mate of inland or river steam or motor vessels.

The minimum service required to qualify an applicant for license as mate of Great Lakes, other lakes, bays, or sounds, or river steam or motor vessels is at least 2 years' service in the deck department of steam, motor, or sail vessels, or barge consorts, 6 months of which service shall have been on steam or motor vessels.

§ 10.05–39 Pilot.

(a) *General.* An applicant for an original license as pilot may be given credit for experience on motor vessels of a class not subject to inspection by the Coast Guard and not required to carry a licensed master or a licensed pilot.

(1) An applicant for an original pilot's license, endorsement as pilot or an extension of pilot's route shall furnish discharges, letters or other satisfactory documentary evidence, certifying to the names of the vessels, the periods of service, the dates and number of round trips made and the capacity in which the applicant served. Photostatic copies of such letters and documents may be accepted for filing with the application.

(b) *Professional requirements.* The minimum service required to qualify an applicant for license as pilot is:

(1) Three years' service in the deck department of ocean, coastwise, Great Lakes or bays, sounds and lakes, other than the Great Lakes, steam or motor vessels, of which 18 months shall have been as able seaman, or service in a capacity at least the equivalent of able seaman. Of the 18 months as able seaman, or equivalent capacity, at least 1 year shall have been on vessels operating on the waters of the class for which pilotage is desired in the capacity of quartermaster, wheelsman, able seaman or equivalent capacity, who stands regular watches at the wheel or in the pilothouse as part of his routine duties; and,

(i) 25 percent of such service shall have been obtained within the three years immediately preceding the date of application; and,

(ii) The required service shall include a minimum number of round trips over the route for which the applicant seeks license as pilot, as may be fixed by the Officer in Charge, Marine Inspection, having jurisdiction (experience on motorboats as defined by statutes may be accepted by the Officer in Charge, Marine Inspection, for license or endorsement as pilot, but such licenses or endorsements shall be limited to a gross tonnage commensurate with such experience, irrespective of any other license or endorsement held by the applicant); and

(iii) One of the required number of round trips shall have been made over the route within the 6 months immediately preceding the date of application; or,

(2) Three years' service in the deck department of any vessel of which at least 1 year shall have been on vessels operating on the waters of rivers while serving in the capacity of quartermaster, wheelsman or deckhand who stands watches at the wheel as part of his routine duties, for license as pilot of river routes. The provisions in subparagraph (1) (i) through (iii) of this paragraph are applicable to this subparagraph.

(3) Two years' service in the deck department of steam or motor vessels navigating canals and small lakes, such as the New York State Barge Canal and Seneca and Cayuga Lakes in the State of New York, 1 year of which shall have been within the 2 years immediately preceding the date of application, for license as pilot of steam and motor vessels of limited tonnage for the waters and/or routes on which the qualifying service was acquired.

(c) *Limitations.* The Officer in Charge, Marine Inspection, issuing a license or endorsement as pilot, shall impose suitable limitations commensurate with the past experience of the applicant, with respect to class of vessels for which valid, tonnage, route and waters.

§ 10.05–41 Pilot of tank vessels of not more than 150 gross tons.

All propelled tank vessels, regardless of length or tonnage, shall be under the command of a person duly licensed and since propelled vessels of less than 150 gross tons may be in command of a licensed pilot, the license of a candidate who successfully passes an examination for this purpose shall be endorsed as follows: "Pilot for tank vessels not more than _____ gross tons on the waters of _____" (the maximum to be inserted is not to exceed 150 gross tons and the waters covered as may be designated by the Officer in Charge, Marine Inspection).

§ 10.05–42 Endorsement of master's or mate's license as pilot or extension of pilot's route.

(a) A master or mate applying for endorsement of his license to act as pilot or a licensed pilot applying for an extension of route, shall make written application on Coast Guard Form CG–866, with documentary evidence of experience acquired by a minimum number of round trips over the particular route or waters for which endorsement or extension of route is desired, as may be required by the Officer in Charge, Marine Inspection, having jurisdiction. One of the required number of round trips shall have been made within the 6 months immediately preceding the date of application. If the applicant is found qualified by experience and written examination as hereafter provided, the endorsement as pilot or extension of route shall be endorsed on his license: *Provided, however,* That upon waters of the United States newly opened to navigation, and where the only pilots obtainable are illiterate Indians or other natives, the fact that such persons can neither read nor write shall not be considered a bar to such Indians or other natives receiving extensions of route of licenses as pilots if they are otherwise qualified.

(b) The holder of a license as master or mate of ocean or coastwise vessels who has had recent satisfactory service under the authority of his license is eligible for examination for endorsement as pilot on any waters upon completing the number of round trips over the route required for his grade of license by the Officer in Charge, Marine Inspection, having jurisdiction, while serving in the capacity of quartermaster, wheelsman or able seaman who stands regular watches at the wheel as part of his routine duties. Experience as an observer, properly certified by the master and/or pilot of the vessel is also acceptable in such cases. An endorsement as pilot granted under these provisions shall be limited to the tonnage and class of vessels for which the holder's license as master or mate is valid except as provided in § 10.05–39(b) (1) (ii).

(c) When an application is made to any Officer in Charge, Marine Inspection, for an extension of route which is outside his jurisdiction he shall request the Officer in Charge, Marine Inspection, having jurisdiction to forward the necessary examination material for examining the applicant. The complete examination file of the applicant shall be returned to the Officer in Charge, Marine Inspection, having jurisdiction, who, if satisfied that the applicant is qualified and capable, shall grant the authority and advise the other Officer in Charge, Marine Inspection, to endorse the license accordingly.

§ 10.05–43 Examination for license as pilot.

(a) An applicant for an original license as pilot or initial endorsement of master's or mate's license as pilot shall be required to pass a satisfactory examination as to his knowledge of the subjects listed in this paragraph:

(1) Rules of the Road.
(2) Inland rules, applicable to route.
(3) Local knowledge of winds, weather, tides, current, etc.
(4) Chart navigation.
(5) Aids to navigation.
(6) Ship handling.
(7) Chart sketch of the route and waters applied for, showing courses, distances, shoals, aids to navigation, depths of water, and other important features of the route.
(8) General: Such further examination as the Officer in Charge, Marine Inspection, may consider necessary to establish the applicant's proficiency.

(b) An applicant for extension of pilot's route shall be examined on the subjects in subparagraphs (1), (2), (7), and (8) in paragraph (a) of this section only.

§ 10.05–45 Examination for license as deck officer of ocean or coastwise steam, motor or sail vessels.

(a) An applicant for license as deck officer of either ocean or coastwise steam and motor vessels, or sail vessels of 100 gross tons or over, or master of steam and motor yachts, shall pass a satisfactory written examination as to his knowledge of the subjects listed in paragraph (b) of this section. However, if the license to be issued is limited on its face in a manner that would make any of the specific subjects unnecessary or superfluous, the examination should be amended accordingly. Examinations for licenses not incorporated in Table 10.05–45 (b) shall be of suitable scope and character to determine the applicant's proficiency.

(b) List of subjects required:

TABLE 10.05-45 (b)—SUBJECTS FOR DECK OFFICERS OF OCEAN OR COASTWISE STEAM OR MOTOR VESSELS

Subjects	Master				Chief mate		Second mate		Third mate		Mate—Limited mineral and oil industry
	Ocean	Coastwise	Yachts	Limited mineral and oil industry	Ocean	Coastwise	Ocean	Coastwise	Ocean	Coastwise	
1. Latitude by Polaris	X	X			X		X				
2. Latitude by meridian altitude method							Sun or star.	Sun	Sun	Sun	
3. Fix or running fix	Any body	Sun or star.	Any body		Any body	Sun or star.	do	do	do		
4. Star identification (any method)	X	X	X		X	X	X				
5. Chart navigation	X	X	X	X	X	X	X	X	X	X	X
6. Compass deviation	Any body	Sun or star.	Sun		Sun or star.	Sun or star.	Sun or star.	Sun	Sun	Sun	
8. Middle latitude sailing			X					X	X		
9. Mercator sailing	X	X	X			X	X				
10. Great Circle sailing	X										
11. Piloting	X	X	X	X	X	X	X	X	X	X	X
12. Aids to navigation	X	X	X	X	X	X	X	X	X	X	X
13. Speed by revolutions	X	X			X						
14. Fuel conservation	X										
15. Instruments and accessories	X	X	X	X	X	X	X	X	X	X	X
16. Magnetism, deviation and compass compensation	X	X	X	[1] X	X						
17. Chart construction	X	X									
18. Tides and currents	X	X		X	X	X	X	X	X	X	X
19. Ocean winds, weather and currents	X	X	X		X		X		X		
20. Nautical astronomy and navigation definitions	X					X	X		X		[3] X
21. International and inland rules of the road	X	X	X	X	X	X	X	X	X	X	X
22. Signaling by international code flags and flashing light; lifesaving, storm and special signals.	X	X		[2] X	X	X	X	X	X	X	[2] X
23. Stability and ship construction	X	X		X	X	X					
24. Seamanship	X	X	X	X	X	X	X	X	X	X	X
25. Cargo stowage and handling		X		X	X	X	X	X	X		X
26. Change in draft due to density		X			X						
27. Determination of area and volume						X	X				
28. Lifesaving apparatus and firefighting equipment	X	X	X	X	X	X	X	X	X	X	X
29. Ship sanitation	X	X			X						
30. Rules and regulations for inspection of merchant vessels.	X	X	X	X	X	X	X	X	X	X	X
31. Laws governing marine inspection	X	X		X	X	X					
32. Ship's business	X	X		X							
33. Such further examination of a nonmathematical character as the Officer in Charge, Marine Inspection, may consider necessary to establish the applicant's proficiency.	X	X	X	X	X	X	X	X	X	X	X

[1] Practical use of the magnetic compass. [2] Lifesaving, storm and special signals. [3] Navigation definitions only.

(c) (1) Each applicant for an ocean or coastwise deck license, whether original or raise of grade, shall be required to pass practical tests in signalling. The examination in signalling will consist of an examination in the international flag code and Morse flashing. Candidates will be examined in Morse flashing in groups where practicable.

(2) Candidates shall be able to read a signal at sight, so far as to name the flags composing the hoist; know the use of the code pennant, numeral and substitute pennants, the meaning of all the single letter signals and the flags used to indicate the quarantine signals; be required to signal some word or words not included in the vocabulary of the code; and have a good knowledge of the distress signals. Candidates will be required to attain a speed of six words a minute in Morse flashing. The average length of a word is to be five letters. Candidates who wish to prove their higher proficiency may request to be tested at a minimum speed of ten words a minute in Morse flashing. Such candidates, if successful, will have the results of their examination reported on their official files.

(3) A candidate for license who fails in signalling, but passes in every other subject, will be considered to have failed the examination and shall be so reported; but he may at any time within the six months following his first attempt be reexamined in signalling only, and if he then passes he will be granted a license.

§ 10.05-46 Radar observer.

(a) Every applicant for an original license, raise of grade, or increase in scope of license for service on ocean, coastwise, or Great Lakes vessels of 300 gross tons and over shall be required to demonstrate, by professional examination, his qualifications as a "radar observer."

(b) Applicants for licenses specified in paragraph (a) of this section shall be examined on the following aspects of the proper operation and utilization of marine radar equipment:

(1) Fundamentals of radar:

(i) How radar works.

(ii) Factors affecting the performance and accuracy of marine radar.

(iii) Description of the purpose and functions of the main components that comprise a typical marine radar installation.

(2) Operation and use of radar:

(i) The purpose and adjustment of controls.

(ii) The detection of malfunctioning, false and indirect echoes and other radar phenomena.

(iii) The effect of sea return and weather.

(iv) The limitations of radar resulting from design factors.

(v) Precautions to be observed in performing simple maintenance of radar equipment.

(vi) Range and bearing measurement.

(vii) Effect of size, shape, and composition of ship targets on echo.

(3) Interpretation and analysis of radar information:

(i) Determining the course and speed of another vessel.

(ii) Determining the time and distance of closest point of approach of a crossing, meeting, overtaking or overtaken vessel.

(iii) Detecting changes of course and/or speed of another vessel after its initial course and speed have been established.

(iv) Factors to consider when determining change in course and/or speed of own vessel to prevent collision on the basis of radar observation of another vessel or vessels.

(4) Plotting (any method that is graphically correct may be used):

(i) The principles and methods of plotting relative and true motion.

(ii) Practical plotting problems.

(c) An applicant for a license who fails the "radar observer" examination but passes in every other subject will be considered as having failed the license examination, but he may at any time within 6 months of his failure be reexamined in the "radar observer" subject only; and, if he then passes, he may be granted a license.

(d) A certificate of successful completion of a course of instruction of a Maritime Administration or other Government operated school, approved by the Commandant, is acceptable evidence of the holder's qualification as "radar observer" without the examination specified in paragraph (b) of this section.

(1) The "Radar Observer Schools" listed in this subparagraph are approved. The approval for a particular school shall be effective for all certificates issued on or after the date of the first class held, as set forth in this subparagraph, and will continue in effect until this ap-

proval is suspended, canceled, or modified by proper authority.

(i) Maritime Administration Radar Observer School, c/o Atlantic Coast Director, 45 Broadway, New York, N.Y., 10004. Physical location: 45 Broadway, New York, N.Y., 10004. First class held: November 18, 1957.

(ii) Maritime Administration Radar Observer School, c/o Pacific Coast Director, U.S. Department of Commerce, Maritime Administration, A50 Golden Gate Ave., Box 36073, San Francisco, Calif., 94102. Physical Location: Fort Mason, San Francisco Army Terminal. First class held: March 3, 1958.

(iii) Maritime Administration Radar Observer School, c/o Gulf Coast Director, Masonic Temple Building, 333 St. Charles Street, New Orleans, La., 70100. Physical location, New Orleans Army Terminal. First class held: July 14, 1958.

(2) The course of instruction in the proper operation and utilization of marine radar equipment is approved as given at the U.S. Merchant Marine Academy, Kings Point, N.Y., 11754. This approval shall be effective for all certificates issued to the deck cadets of the U.S. Merchant Marine Academy and attesting to the successful completion of the course in the proper operation and utilization of marine radar equipment on or after July 17, 1959, and will continue in effect until this approval is suspended, canceled, or modified by proper authority.

(3) The course of instruction in the proper operation and utilization of marine radar equipment is approved as given at the U.S. Army Transportation School, Fort Eustis, Va., 24437. This approval shall be effective for all certificates issued to men attesting to the successful completion of the course in the proper operation and utilization of marine radar equipment on or after June 6, 1960, and will continue in effect until this approval is suspended, canceled, or modified by proper authority.

(4) The course of instruction in the proper operation and utilization of marine radar equipment is approved as given at the State University of New York, Maritime College, Fort Schuyler, New York, N.Y., 10065. This approval shall be effective for all certificates issued to the deck cadets of the New York Maritime College which attest to the successful completion of the course in the proper operation and utilization of marine radar equipment on or after November 17, 1960, and will continue in effect until this approval is suspended, cancelled or modified by proper authority.

(5) The course of instruction in the proper operation and utilization of marine radar equipment is approved as given at the Maine Maritime Academy, Castine, Maine, 04421. This approval shall be effective for all certificates issued to the deck cadets of the Maine Maritime Academy which attest to the successful completion of the course of instruction in the proper operation and utilization of marine radar equipment on or after July 2, 1963, and will continue in effect until this approval is suspended, canceled, or modified by the proper authority.

(Sec. 3, 54 Stat. 341, as amended, sec. 2, 68 Stat. 484; 46 U.S.C. 1333, 239b)

§ 10.05–47 Examination for license as master of Great Lakes steam and motor vessels.

(a) An applicant for license as master of Great Lakes steam or motor vessels shall be required to pass a satisfactory examination as to his knowledge of the subjects listed in this paragraph:

(1) Rules of the Road.
(2) Deviation by azimuth of the sun.
(3) Deviation by azimuth of Polaris.
(4) Construction of a deviation table by any method:
(i) Azimuth of sun or Polaris.
(ii) Equidistant bearings of a fixed object.
(iii) Ranges.
(iv) Comparison with a gyro or magnetic compass whose deviation is known.
(5) Distance off by bearings and run.
(6) Distance off by distance-finding stations.
(7) Distance off by visibility of lights.
(8) Speed by revolutions and by observation.
(9) Instruments and accessories used in navigation.
(10) Magnetism, deviation, and compass compensation.
(11) Chart navigation and piloting.
(12) Aids to navigation.
(13) Winds and weather.
(14) Signals; storm, wreck, distress, and special.
(15) Stability and ship construction.
(16) Cargo stowage and handling.
(17) Seamanship.
(18) Temporary repairs to hull and equipment.
(19) Drills and lifesaving apparatus.
(20) Ship sanitation; Rules and Regulations for Vessel Inspection, and Navigation Laws of the United States.
(21) Ship's business.
(22) General.
(23) Practical chart work.
(24) Such further examination of a nonmathematical character as the Officer in Charge, Marine Inspection, may consider necessary to establish the applicant's proficiency.

§ 10.05–49 Examination for license as master of bays, sounds, and lakes other than the Great Lakes steam and motor vessels.

(a) An applicant for license as master of bays, sounds, and lakes other than the Great Lakes steam or motor vessels shall be required to pass a satisfactory examination as to his knowledge of the subjects listed in this paragraph:

(1) Rules of the Road applicable to the waters desired.
(2) Distance off by bearings and run.
(3) Speed by revolutions and by observation of landmarks.
(4) Chart navigation and piloting.
(5) Aids to navigation.
(6) Winds, weather, and current.
(7) Signals; storm, wreck, distress, and special.
(8) Stability and ship construction.
(9) Cargo stowage and handling.
(10) Seamanship.
(11) Temporary repairs to hull and equipment.
(12) Drills and lifesaving apparatus.
(13) Ship sanitation; Rules and Regulations for Vessel Inspection, and Navigation Laws of the United States.
(14) Ship's business.
(15) General.
(16) Practical chart work.
(17) Such further examination of a nonmathematical character as the Officer in Charge, Marine Inspection, may consider necessary to establish the applicant's proficiency.

§ 10.05–51 Examination for license as master of river steam or motor vessels.

(a) An applicant for license as master of river steam or motor vessels shall be required to pass a satisfactory examination as to his knowledge of the subjects listed in this paragraph:

(1) Rules of the Road.
(2) Shiphandling and navigation of river vessels.
(3) Instruments and accessories.
(4) Aids to navigation.
(5) Seamanship.
(6) Ship construction.
(7) Cargo stowage and handling.
(8) Temporary repairs to hull and equipment.
(9) Drills; lifesaving and firefighting equipment and procedures.
(10) Rules and regulations for vessel inspection and navigation laws of the United States; ship sanitation.
(11) Mathematics.
(12) General.
(13) Such further examination of a nonmathematical character as the Officer in Charge, Marine Inspection, may consider necessary to establish the applicant's proficiency.

§ 10.05–53 Examination for license as master of ferry steam or motor vessels.

An applicant for license as master of ferry steam or motor vessels on either the Great Lakes, other lakes, bays, and sounds, or rivers shall be required to pass satisfactorily an examination of such length and scope as will satisfy the Officer in Charge, Marine Inspection, that the applicant is capable of handling and navigating such vessels.

§ 10.05–55 Examination for license as master or pilot of yachts on the Great Lakes, other lakes, bays, and sounds, or rivers.

An applicant for license as master or pilot of yachts on either the Great Lakes, other lakes, bays, and sounds, or rivers, shall be required to pass a satisfactory examination as to his knowledge in handling such vessels, and his familiarity with the lights, lighthouses, channels, buoys, obstructions, courses, and distances between certain points in the waters for which he makes application for license. He shall also be examined regarding his knowledge of the Rules of the Road for such waters, the running and anchor lights, fog signals, the use of the lead, signal bells between engine-room and pilothouse, the General Rules

and Regulations for Vessel Inspection, and such further examination of a non-mathematical character as the Officer in Charge, Marine Inspection, may consider necessary to establish the applicant's proficiency.

§ 10.05–57 Examination for license as master of passenger barges on the Great Lakes, other lakes, bays, and sounds, or rivers.

An applicant for license as master of passenger barges on the Great Lakes, other lakes, bays, and sounds, or rivers shall be required to pass satisfactorily an examination of such length and scope as will satisfy the Officer in Charge, Marine Inspection, that the applicant is capable of handling the class of vessel for which he desires a license.

§ 10.05–59 Examination for license as mate of inland or river steam or motor vessels.

An applicant for license as mate of inland or river steam or motor vessels shall be required to pass a satisfactory examination as to his knowledge, experience, and skill in stowage and cargo handling, the operation and handling of fire apparatus, the launching and handling of lifeboats, his knowledge of life preservers and the method of adjusting them, his ability to manage the crew and direct and advise the passengers in case of emergency, his general familiarity with his duties in maintaining discipline and protecting the passengers, and such further examination of a non-mathematical character as the Officer in Charge, Marine Inspection, may consider necessary to establish the applicant's proficiency.

§ 10.05–61 Evaluation of experience not listed.

When an applicant presents evidence of service or experience which does not meet the specific requirements of the regulations in this part, but which in the opinion of the Officer in Charge, Marine Inspection, is a reasonable equivalent thereto, the application for license with supporting data shall be submitted to the Commandant for evaluation, together with the recommendation of the Officer in Charge, Marine Inspection.

Subpart 10.10—Professional Requirements for Engineer Officers' Licenses (Inspected Vessels)

AUTHORITY: The provisions of this Subpart 10.10 interpret or apply R.S. 4417a, as amended, 4426, as amended, 4427, as amended, 4438, as amended, 4438a, as amended, 4441, as amended, 4443, as amended, 4445, as amended, 4447, as amended, sec. 2, 29 Stat. 188, as amended, sec. 1, 34 Stat. 1411, as amended, secs. 1, 2, 1544, 1545, as amended, sec. 3, 70 Stat. 152, and sec. 3, 68 Stat. 675; 46 U.S.C. 381a, 404, 405, 224, 224a, 229, 230, 231, 233, 225, 237, 367, 390b, 50 U.S.C. 198. Treasury Department Orders 167–14, Nov. 26, 1954, 19 F.R. 8026; 167–20, June 18, 1956, 21 F.R. 4894.

§ 10.10–1 No restriction as to waters on engineer's licenses.

(a) Except as otherwise specified in this part no engineer's license issued shall be restricted as to the waters upon which the engineer may serve, except that such restrictions on any license, when presented for renewal, shall not be changed without the licensee's consent.

(b) The holder of an engineer's license which is restricted as to waters may serve in the capacity and within the limitations in the license upon other waters without special endorsement as follows:

(1) *"Ocean."* This includes coastwise waters; Great Lakes; bays, sounds, and lakes other than the Great Lakes; and rivers.

(2) *"Coastwise."* This includes the Great Lakes; bays, sounds, and lakes other than the Great Lakes; and rivers.

(3) *"Great Lakes."* This includes bays, sounds, and lakes other than the Great Lakes, and rivers.

(4) *"Bays, sounds, and lakes other than the Great Lakes."* This includes rivers.

(5) *"Inland waters."* This includes the Great Lakes; bays, sounds, and lakes other than the Great Lakes; and rivers.

(6) *"Rivers."* This does not include any other type of waters.

§ 10.10–3 Grade and type of engineer licenses issued and limitations placed thereon.

(a) Licenses in the grades of chief engineer, first assistant engineer, second assistant engineer, and third assistant engineer authorizing service on steam vessels or on motor vessels or on steam and motor vessels, shall be issued to applicants who qualify therefor.

(b) Engineer's licenses of all grades and types may be subject to such horsepower limitation as the Officer in Charge, Marine Inspection, shall deem appropriate. The horsepower limitations to be placed on a license shall be based on the applicant's qualifying experience; however, in no case shall an applicant's license be limited to a lower horsepower than the highest horsepower on which 25 percent or more of his experience was obtained. The applicant whose qualifying service has all been on Coast Guard inspected vessels of 4,000 horsepower or over shall be considered eligible for an engineer's license of unlimited horsepower.

§ 10.10–4 Examination for license as engineer officer of steam or motor vessels.

(a) An applicant for license as engineer officer of either steam or motor vessels shall pass a satisfactory written examination as to his knowledge of the subjects listed in paragraph (b) of this section. However, if the license to be issued is limited on its face in a manner that would make any of the specific subjects unnecessary or superfluous, the examination shall be amended accordingly. Examinations for any license not incorporated in Table 10.10–4(b) shall be of suitable scope and character to determine the applicant's proficiency.

(b) List of subjects required:

TABLE 10.10–4(b)—SUBJECTS FOR ENGINEER OFFICERS' LICENSES OF STEAM OR MOTOR VESSELS

Subjects	Steam				Motor			
	Chief engineer		Assistant engineer		Chief engineer		Assistant engineer	
	Over 2,000 hp	2,000 hp and less	Over 2,000 hp	2,000 hp and less	Over 2,000 hp	2,000 hp and less	Over 2,000 hp	2,000 hp and less
General								
1. Pumps and compressors	X	X	X	X	X	X	X	X
2. Heat exchangers	X	X	X	X	X	X	X	X
3. Propellers and shafting	X	X	X	X	X	X	X	X
4. Steering and miscellaneous machinery	X	X	X	X	X	X	X	X
5. Valves—reducing, control, etc.	X	X	X	X	X	X	X	X
6. Condensers, air ejectors and vacuum	X	X	X	X				
7. Engineering definitions and principles	X	X	X	X	X	X	X	X
8. Instruments	X	X	X	X	X	X	X	X
9. Lubrication	X	X	X	X	X	X	X	X
10. Inspection	X	X	X	X	X	X	X	X
11. Mathematics	[1] X	[1] X	[1] X	[1] X	[1] X	[1] X	[1] X	[1] X
12. Sketch		X	X	X			X	X
13. Three dimensional drawing	X				X			
14. Ship construction and repair	X	X	X	X	X	X	X	X
Steam Engines								
21. Reciprocating—construction, operation, maintenance	X	X	X	X				
22. Turbine—construction, operation, maintenance	X	X	X	X				
23. Reduction gear and miscellaneous	X	X	X	X				
24. Steam governors	X	X	X	X				

See footnotes at end of table.

TABLE 10.10-4(b)—SUBJECTS FOR ENGINEER OFFICERS' LICENSES OF STEAM OR MOTOR VESSELS—Continued

Subjects	Steam				Motor			
	Chief engineer		Assistant engineer		Chief engineer		Assistant engineer	
	Over 2,000 hp	2,000 hp and less	Over 2,000 hp	2,000 hp and less	Over 2,000 hp	2,000 hp and less	Over 2,000 hp	2,000 hp and less
Motor								
31. Construction, operation, maintenance					X	X	X	X
32. Operating principles					X	X	X	X
33. Fuel injection					X	X	X	X
34. Air compressors					X	X	X	X
35. Operation and maintenance of auxiliary diesel engines	X	X	X	X				
36. Air—starting, combustion					X	X	X	X
37. Governors					X	X	X	X
Boilers								
41. Watertube—construction, operation, maintenance	X	X	X	X	[1] X		[1] X	
42. Firetube—construction, operation, maintenance	X	X	X	X	[1] X		[1] X	
43. General—construction, operation, maintenance	X	X	X	X	[1] X		[1] X	
44. Safety valves	X	X	X	X	[1] X		[1] X	
45. Corrosion and feedwater	X	X	X	X	[1] X		[1] X	
46. Fuels and combustion	X	X	X	X	[1] X		[1] X	
Electricity								
51. Direct current	X	X	X	X	X	X	X	X
52. Alternating current	X	X	X	X	X	X	X	X
53. General—switchboards, controls, wiring	X	X	X	X	X	X	X	X
54. Storage batteries	X	X	X	X	X	X	X	X
55. Electric drive	X	X	X	X	X	X	X	X
56. Problems	X	X	X	X	X	X	X	X
Refrigeration								
61 Freon—construction, operation, maintenance	[1] X		[1] X		[1] X		[1] X	
62. Definitions and principles	[1] X		[1] X		[1] X		[1] X	
Engineering Safety								
71. Fire prevention	X	X	X	X	X	X	X	X
72. Fire equipment	X	X	X	X	X	X	X	X
73. Fire fighting	X	X	X	X	X	X	X	X
74. Respiratory apparatus and emergency equipment	X	X	X	X	X	X	X	X
75. Casualty and damage control	X	X	X	X	X	X	X	X
76. Rules and regulations	X	X	X	X	X	X	X	X
77. Safe handling of inflammable and combustible liquids	X	X	X	X	X	X	X	X

[1] Each candidate will receive a minimum of four mathematical questions which shall be graded with the "general" subject, however, a minimum grade of 70 percent shall be required for mathematics.
[2] A candidate for license limited to towing or ferry vessels shall not be examined in this subject.

(c) Each applicant for an original or raise in grade of license as engineer of steam vessels of over 2,000 horsepower shall be required to demonstrate his ability to analyze boiler water. When conditions permit, the test shall be performed by chemical analysis of a water sample.

§ 10.10–5 Removal of restriction as to waters on an engineer's license.

Upon renewal or at his request, any engineer who holds a license restricted as to waters shall be allowed the choice of accepting a limitation as to horsepower in lieu of the restriction as to waters. The horsepower limitation shall be determined by the Officer in Charge, Marine Inspection, in accordance with the applicant's experience. The licensee shall be required to agree in writing to such conditions of renewal before the issuance of the license requested.

§ 10.10–6 Raising and removing horsepower limitations.

(a) Applications for a change in horsepower limitation shall be accompanied by a letter of recommendation from the vessel owner, operator or chief engineer.

(b) Notwithstanding the provisions of § 10.02–15(c) of this part, changes in horsepower limitations based on service required by paragraph (c) of this section may be granted without further written examination providing the Officer in Charge, Marine Inspection, in whose office the applicant's previously written examination is filed, considers said examination is satisfactory for the higher license.

(c) The following service on vessels of 4,000 horsepower or over will be considered qualifying, insofar as service is concerned, for the raising or removing of horsepower limitations placed on engineer licenses:

(1) Twelve months' service in the highest grade licensed: removal of all horsepower limitations.

(2) Six months' service in any licensed capacity other than the highest grade for which licensed: removal of all horsepower limitations for the grade in which service is performed and raise the next higher grade license to the horsepower of the vessel on which service was performed.

(3) Twelve months' service as oiler or Junior Engineer holding a license as Third Assistant Engineer: removal of all horsepower limitations on Third Assistant Engineer's license.

(4) Six months' service as oiler or Junior Engineer holding a license as Second Assistant Engineer: removal of all horsepower limitations on Third Assistant Engineer's license.

§ 10.10–7 Conversion of licenses from gross tonnage to horsepower limitations upon renewal.

(a) Steam or motor engineer's licenses issued for any gross tons on specified waters shall be converted to any horsepower for the same waters, when renewed by an Officer in Charge, Marine Inspection.

(b) Upon renewal of any engineer's license which is limited as to gross tonnage the tonnage shall be converted to horsepower on the new license in the ratio of 3 to 4 (i. e.: 750 gross tons to 1,000 horsepower), except in those cases where an applicant has obtained experience on vessels of greater horsepower than the above ratio would entitle him. In such cases a license of greater horsepower commensurate with the experience obtained may be issued.

§ 10.10–9 Chief engineer; steam vessels.

(a) The minimum service required to qualify an applicant for license as chief engineer of steam vessels is:

(1) One year's service as first assistant engineer of steam vessels; or,

(2) Two years' service as second assistant or junior first assistant engineer in charge of a watch on steam vessels while holding a license as first assistant engineer of steam vessels; or,

(3) While holding a license as chief engineer of motor vessels, either:

(i) Six months' service as first assistant engineer of steam vessels;

(ii) Six months' service as observer chief engineer on steam vessels; or,

(iii) One year's service as oiler, watertender, or junior engineer of steam vessels.

§ 10.10–11 Chief engineer; motor vessels.

(a) The minimum service required to qualify an applicant for license as chief engineer of motor vessels is:

(1) One year's service as first assistant engineer of motor vessels; or,

(2) Two years' service as second assistant or junior first assistant engineer in charge of a watch on motor vessels while holding a license as first assistant engineer of motor vessels; or,

(3) While holding a license as chief engineer of steam vessels, either:

(i) Three months' service as first assistant engineer of motor vessels;

(ii) Three months' service as observer chief engineer on motor vessels; or,

(iii) Six months' service as oiler or junior engineer of motor vessels.

§ 10.10–13 First assistant engineer; steam vessels.

(a) The minimum service required to qualify an applicant for license as first assistant engineer of steam vessels is:

(1) One year's service as second assistant engineer of steam vessels; or,

(2) Two years' service as third assistant or junior second assistant engineer in charge of a watch on steam vessels, while holding a license as second assistant engineer of steam vessels; or,

(3) While holding a license as first assistant engineer of motor vessels, either:

(i) Six months' service as second assistant engineer of steam vessels;

(ii) Six months' service as observer first assistant engineer on steam vessels; or,

(iii) One year's service as oiler, watertender, or junior engineer of steam vessels; or,

(4) Three years' service as oiler, watertender, or fireman on steam vessels for a license as first assistant engineer of steam towing or ferry vessels of not more than 2,000 horsepower; or,

(5) While holding a license as third assistant engineer of steam vessels of any horsepower, three months' service as third assistant engineer or observer first assistant engineer on steam vessels for a license as first assistant engineer of steam towing or ferry vessels of not over 2,000 horsepower; or,

(6) Three years' service as oiler, watertender or fireman on steam vessels for a license as first assistant engineer of steam vessels of not more than 1,000 horsepower.

§ 10.10–15 First assistant engineer; motor vessels.

(a) The minimum service required to qualify an applicant for license as first assistant engineer of motor vessels is:

(1) One year's service as second assistant engineer of motor vessels; or,

(2) Two years' service as third assistant engineer or junior second assistant engineer in charge of a watch on motor vessels, while holding a license as second assistant engineer of motor vessels; or,

(3) While holding a license as first assistant engineer of steam vessels, either:

(i) Three months' service as second assistant engineer of motor vessels;

(ii) Three months' service as observer first assistant engineer on motor vessels; or,

(iii) Six months' services as oiler or junior engineer of motor vessels; or,

(4) Three years' service as oiler or fireman on motor vessels for a license as first assistant engineer of motor towing or ferry vessels of not more than 2,000 horsepower; or,

(5) While holding a license as third assistant engineer of motor vessels of any horsepower, three months' service as third assistant engineer or observer first assistant engineer on motor vessels for a license as first assistant engineer of motor towing or ferry vessels of not over 2,000 horsepower; or,

(6) Three years' service as oiler or fireman on motor vessels for a license as first assistant engineer of motor vessels of not more than 1,000 horsepower .

§ 10.10–17 Second assistant engineer; steam vessels.

(a) The minimum service required to qualify an applicant for license as second assistant engineer of steam vessels is:

(1) One year's service as engineer in charge of a watch, while holding a license as third assistant engineer of steam vessels; or,

(2) Two years' service as assistant engineer to the engineer in charge of a watch, while holding a license as third assistant engineer of steam vessels; or,

(3) Five years' service in the engine department of steam or motor vessels, 1 year of this required service may have been on motor vessels; 4 years and 6 months of which must have been as a qualified member of the engine department, 2 years and 6 months of which must have been as fireman, oiler, watertender, or junior engineer on steam vessels; or,

(4) While holding a license as second assistant engineer of motor vessels, either:

(i) Six months' service as third assistant engineer of steam vessels;

(ii) Six months' service as an observer second assistant engineer on steam vessels; or,

(iii) One year's service as oiler, watertender, or junior engineer of steam vessels.

§ 10.10–19 Second assistant engineer; motor vessels.

(a) The minimum service required to qualify an applicant for license as second assistant engineer of motor vessels is:

(1) One year's service as engineer in charge of a watch, while holding a license as third assistant engineer of motor vessels; or,

(2) Two years' service as assistant engineer to the engineer in charge of a watch, while holding a license as third assistant engineer of motor vessels; or,

(3) Five years' service in the engine department of motor or steam vessels, 1 year of this required service may have been on steam vessels; 4 years and 6 months of which must have been as a qualified member of the engine department, 2 years and 6 months of which must have been as oiler or junior engineer on motor vessels; or,

(4) While holding a license as second assistant engineer of steam vessels, either:

(i) Three months' service as third assistant engineer of motor vessels;

(ii) Three months' service as observer second assistant engineer on motor vessels; or,

(iii) Six months' service as oiler or junior engineer of motor vessels.

§ 10.10–21 Third assistant engineer; steam vessels.

(a) The minimum service required to qualify an applicant for license as third assistant engineer of steam vessels is:

(1) Three years' service in the engine department of steam or motor vessels, one-third of this required service may have been on motor vessels; 2 years and 6 months of which must have been as a qualified member of the engine department, 1 year and 6 months of which must have been as fireman, oiler, watertender or junior engineer on steam vessels; or,

(2) Three years' service as an apprentice to the machinist trade engaged in the construction or repair of marine, locomotive, or stationary engines together with 1 year's service in the engine department of steam vessels as oiler, watertender, or junior engineer, one-third of such service may have been on motor vessels; or,

(3) Graduation from:

(i) The U. S. Merchant Marine Academy (engineering);

(ii) The engineering class of a nautical schoolship approved by and conducted under rules prescribed by the Commandant and listed in Part 166 of Subchapter R (Nautical Schools) of this chapter;

(iii) The U. S. Naval Academy; or,

(iv) The U. S. Coast Guard Academy; or,

(4) Satisfactory completion of the prescribed course (engineering) at a U. S. Maritime Service or other Government operated training school approved by the Commandant may be accepted as the equivalent of sea service up to a maximum of four months, provided the applicant has obtained the additional qualifying experience prior to enrollment; or,

(5) Graduation from the marine engineering course of a duly recognized school of technology together with 3 months' service in the engine department of steam vessels, one-third of such service may have been on motor vessels; or,

(6) Graduation from the mechanical or electrical engineering course of a duly recognized school of technology together with 6 months' service in the engine department of steam vessels, one-third of such service may have been on motor vessels; or,

(7) One year's service as oiler, watertender, or junior engineer on steam vessels while holding a license as third assistant engineer of motor vessels.

§ 10.10–23 Third assistant engineer; motor vessels.

(a) The minimum service required to qualify an applicant for license as third assistant engineer of motor vessels is:

(1) Three years' service in the engine department of motor or steam vessels, one-third of this required service may have been on steam vessels; 2 years and 6 months of which must have been as a qualified member of the engine department, 1 year and 6 months of which must have been as oiler or junior engineer on motor vessels; or,

(2) Three years' service as an apprentice to the machinist trade engaged in the construction or repair of marine, locomotive, or stationary engines together with 1 year's service in the engine department of motor vessels as oiler or junior engineer, one-third of such service may have been on steam vessels; or,

(3) Graduation from:

(i) The U. S. Merchant Marine Academy (engineering);

(ii) The engineering class of a nautical schoolship approved by and con-

ducted under rules prescribed by the Commandant and listed in Part 166 of Subchapter R (Nautical Schools) of this chapter;

(iii) The U. S. Naval Academy; or,

(iv) The U. S. Coast Guard Academy; or

(4) Satisfactory completion of the prescribed course (engineering) at a U. S. Maritime Service or other Government operated training school approved by the Commandant may be accepted as the equivalent of sea service up to a maximum of 4 months, provided the applicant has obtained the additional qualifying experience prior to enrollment; or,

(5) Graduation from the marine engineering course of a duly recognized school of technology together with 3 months' service in the engine department of motor vessels, one-third of such service may have been on steam vessels; or,

(6) Graduation from the mechanical or electrical engineering course of a duly recognized school of technology together with 6 months' service in the engine department of motor vessels, one-third of such service may have been on steam vessels; or,

(7) Six months' service as oiler or junior engineer on motor vessels while holding a license as third assistant engineer of steam vessels.

§ 10.10–25 Engineers of motor vessels operating in Puerto Rican and Hawaiian waters.

(a) An applicant for an engineer's license of seagoing vessels propelled by internal combustion engines navigating exclusively between ports in the Hawaiian Islands, or navigating exclusively between ports of the Island of Puerto Rico and/or the Virgin Islands, shall submit with his application statements duly executed and certified by reputable citizens qualified to judge the character and ability of the applicant. The Officer in Charge, Marine Inspection, shall make a diligent inquiry as to the applicant's character and merits and, if satisfied by the oral examination or practical demonstration, and the proof of requisite knowledge and skill offered, the Officer in Charge, Marine Inspection, shall issue the license. No certificate from the United States Public Health Service based upon the subject of ship sanitation and first aid shall be required of such applicant.

(b) An applicant for an engineer's license of motor vessels operating exclusively in Puerto Rican waters or exclusively in Hawaiian waters shall present evidence of a minimum of 3 years' service on such vessels.

§ 10.10–27 Service as engineroom watch electrician or refrigeration watch engineer.

An applicant for a raise of grade of engineer's license for steam or motor vessels may substitute service as engineroom watch electrician on electric drive steam or motor vessels or refrigeration watch engineer for other service required. The service shall be accepted on the basis of 2 months' service as watch electrician or refrigeration watch engineer to count as 1 month of required service. Such service shall not be substituted for more than one-half the service required on a license. This service as engineroom watch electrician or refrigeration watch engineer must have been acquired while the applicant was holding the license which is to be raised in grade.

§ 10.10–29 Evaluation of experience not listed.

When an applicant presents evidence of service or experience which does not meet the specific requirements of the regulations in this part, but which in the opinion of the Officer in Charge, Marine Inspection, is a reasonable equivalent thereto, the application for license with supporting data shall be submitted to the Commandant for evaluation, together with the recommendation of the Officer in Charge, Marine Inspection.

Subpart 10.13—Licensing of Radio Officers

AUTHORITY: The provisions of this Subpart 10.13 interpret or apply secs. 1–8, 62 Stat. 232–234; 46 U.S.C. 229a–229h. Treasury Department Order 120, July 31, 1950, 15 F.R. 6521. Other statutory provisions interpreted or applied are cited to text in parentheses.

§ 10.13–1 Applicability of laws.

(a) The provisions of Title 46, U.S. Code, sections 229a to 229h provide that radiotelegraph operators shall be licensed officers.

(b) The regulations in this subpart implement the provisions in Title 46, U.S. Code, sections 229a to 229h, and provide for the issuance to qualified applicants of licenses as radio officers subject to all of the conditions provided in law.

§ 10.13–3 Definitions.

(a) *License.* Where the word "license" appears throughout this subpart it shall be construed as meaning a license issued by the Coast Guard, unless indicated otherwise.

(b) *Original license.* The first license issued to a radiotelegraph operator by the Coast Guard shall be considered an original license, when the records of the Coast Guard show no previous issue to such person.

§ 10.13–5 General provisions respecting all licenses issued.

(a) Applicants for licenses, issued in accordance with this subpart, are charged with the duty of establishing to the satisfaction of the Coast Guard that they possess all of the qualifications necessary, such as, age, experience, character and citizenship, before they shall be entitled to be issued licenses. Until an applicant meets this mandatory requirement, he is not entitled to be licensed to serve as an officer on a vessel of the United States. No person who has been convicted by court-martial of desertion or treason in time of war, or has lost his nationality for any of the other reasons listed in 8 U.S.C. 1481, is eligible for a license. Neither is a person eligible for a license, who has been convicted by a court of record of a violation of the narcotic drug laws of the United States, the District of Columbia, or any State or Territory of the United States, within ten years prior to the date of filing the application; or who, unless he furnishes satisfactory evidence that he is cured, has ever been the user of or addicted to the use of a narcotic drug.

(b) After application to an Officer in Charge, Marine Inspection, any person who is found qualified under the requirements set forth in this subpart shall be issued an appropriate license valid for a term of five (5) years, provided he continues to hold a valid first- or second-class radiotelegraph operator's license issued by the Federal Communications Commission.

(c) Every person to whom a license is issued shall place his signature and left thumbprint thereon.

(d) Every person who receives a license shall make oath before an Officer in Charge, Marine Inspection, or commissioned officer of the Coast Guard authorized to administer oaths under 10 U.S.C. 936 or 14 U.S.C. 636, to be recorded upon his official file, that he will faithfully and honestly, according to his best skill and judgment, without concealment or reservation, perform all the duties required of him by law.

(Sec. 2, 64 Stat. 464; 46 U.S.C. 239b. Treasury Department Order 167–9, August 3, 1954, 19 F.R. 5195)

§ 10.13–7 Citizenship and age requirements for all licenses issued.

(a) No license shall be issued to any person who is not a United States citizen. An applicant claiming to be a citizen of the United States shall furnish documentary evidence of his citizenship. Acceptable evidence of citizenship is described in § 10.02–5.

(b) Any citizen who has attained the age of 19 years and is qualified in all other respects shall be eligible for a license.

§ 10.13–9 Evidence of professional competence for all licenses issued.

Each applicant for a license must present to the Officer in Charge, Marine Inspection, at the time of making application his currently valid first- or second-class radiotelegraph operator's license issued by the Federal Communications Commission.

§ 10.13–13 General requirements for original licenses.

(a) *First aid certificate.* No candidate for original license shall be qualified until he presents a certificate from the United States Public Health Service that he has passed a satisfactory examination based on the contents of "The Ship's Medicine Chest and First Aid at Sea," or other manual arranged for the purpose and having the approval of the United States Public Health Service.

(b) *Written application.* (1) The Officers in Charge, Marine Inspection, shall require all applicants for original licenses to make written applications upon Coast Guard Form CG–866.

(2) This application shall be submitted in duplicate. The applicant shall also furnish two unmounted, dull finish photographs, 2 inches by 1½

inches, of passport type taken within 1 year of the date of application. Photographs shall show the full face, at least 1 inch in height, with the head uncovered, and shall be a satisfactory likeness of the applicant. The issuing officer shall affix a photograph to each of the applications and impress his official seal partly over the photograph, after the applicant has in his presence signed the applications.

(3) The applicant shall place his left thumbprint on each of the applications.

(4) The applicant shall enter on the application form the number, class, and date of issuance of his currently valid Federal Communications Commission license.

(5) The applicant shall make and subscribe to an oath or affirmation, before the issuing officer, to the truth of all the statements set forth in his application. Any applicant who shall make or subscribe to any oath or affirmation on the application form and knowing the same to be false shall be deemed guilty of perjury.

(c) *Evidence of employment.* Applicants for licenses must present to the Officers in Charge, Marine Inspection, at the time of making application evidence that they are going to sea or expect to go to sea. This evidence shall be in the form of one of the following and shall be entered on the application form:

(1) A currently valid certificate of service as radio operator or merchant mariner's document endorsed as radio operator.

(2) One or more certificates of discharge showing service as radio operator on a merchant vessel. Evidence of service on United States Government vessels or foreign vessels is acceptable.

(3) An applicant for a license who has not served as radio operator aboard a vessel must present satisfactory proof that he has a commitment of employment as a radio operator on a United States merchant vessel. This proof shall be in the form of a letter and shall be signed by a responsible official of the vessel, agent, owner, operator, or organization concerned with manning vessels.

(d) *Surrender of certificate of service.* Upon the issuance of a license the certificate of service as radio operator or merchant mariner's document endorsed as radio operator held by the licensee shall be surrendered to the issuing officer.

§ 10.13–15 Physical examinations for original licenses.

(a) All applicants for original licenses shall be required to pass physical examinations given by a medical officer of the United States Public Health Service and present certificates executed by this Public Health Service Officer to the Officers in Charge, Marine Inspection. This certificate shall attest to the applicant's acuity of vision and general physical condition.

(b) Epilepsy, insanity, senility, acute venereal disease or neurosyphilis, badly impaired hearing, or other defect that would render the applicant incompetent to perform the ordinary duties of a radio officer at sea are causes for certification as incompetent.

(c) For original license the applicant must have, either with or without glasses, at least 20/30 vision in one eye and at least 20/50 in the other. The applicant who wears glasses, however, must also be able to pass a test without glasses of at least 20/50 in one eye and at least 20/70 in the other. Any applicant for original license who is possessed of monocular vision and who has served as a radio operator on merchant vessels of the United States while possessed of such vision may be issued a license if eligible in all other respects. Vision of at least 20/30 without glasses in the remaining eye shall be required in all such cases.

(d) Where an applicant is not possessed of the vision, hearing, and general physical condition considered necessary, the Officer in Charge, Marine Inspection, after consultation with the Public Health Service physician, shall make a recommendation to the Commandant for an exception to these requirements if, in their opinion, extenuating circumstances warrant special consideration. Any request for a decision by the Commandant must be accompanied by all pertinent correspondence, records, and reports. Special consideration will be given to an applicant who has served satisfactorily at sea as a radio operator even though he is possessed of physical defects which would be cause for rejection of an applicant with no sea service. Recommendations from interested parties having knowledge of the applicant's qualifications will be given full consideration in arriving at a decision.

§ 10.13–17 Character check and references required for original licenses.

(a) In those cases where an applicant for an original license has served at sea as a radio operator, the Officer in Charge, Marine Inspection, shall require such applicant to have written endorsements of a master of a vessel on which he has served, together with those of two other licensed officers. Upon a showing that the written endorsements required above cannot be obtained without undue delay or hardship, the Officer in Charge, Marine Inspection, may accept in lieu of these endorsements those from officials of the steamship company or other employers of the applicant. Letters of recommendation attesting to the applicant's character, etc., from former employers of the applicant may be accepted in lieu of the endorsements, but such letters must be filed with the application. Where no sea service has been obtained, the applicant shall have the written endorsements of three reputable persons to whom he is well-known.

(b) Fingerprint records of each applicant shall be made on FBI Form "Applicant." This record shall be submitted to the Commandant together with the application for license.

(c) Every application for an original license shall be approved by the Commandant. No license shall be issued or temporary permit granted pending the Commandant's authorization.

(d) (1) The application of any person may be rejected by the Commandant when derogatory information has been brought to his attention which indicates that the applicant's character and habits of life are such as to authorize the belief that he is not a suitable and safe person to be entrusted with the duties of radiotelegraph operator on any vessel.

(2) Applications will be rejected and the issuance of licenses refused to persons in the following categories:

(i) Those who have been convicted in the courts of offenses such as: Crimes of violence on shipboard and in certain instances ashore; sabotage; possession, use, or sale of narcotics; smuggling of aliens into the United States; malicious destruction of ship's property; serious cases of theft of ship's property or stores; and offenses of an infamous character.

(ii) Those who have been disapproved for service as radio operator aboard merchant vessels of the United States in time of war.

(iii) Those who have been issued a dishonorable discharge from any of the armed services of the United States.

(3) Where an application for a license is rejected by the Commandant under the provisions of this section, the application will be reconsidered upon written request of the applicant, provided he can produce additional evidence of satisfactory character and habits over a reasonable period of time immediately prior to the date of request for reconsideration. This evidence may consist of certificates showing satisfactory service in any of the armed forces of the United States; or letters from employers, from persons having direct and personal knowledge of the applicant, or from reputable institutions. The letters should indicate familiarity of the writer with the applicant, approximate dates of employment (if any), and other pertinent statements indicating the writer's belief about the applicant's character and habits.

(4) The fact that an applicant for an original license is on probation as a result of action under R. S. 4450, as amended (46 U.S.C. 239), does not itself make such an applicant ineligible, provided he meets all the requirements for such original license. However, any original license issued under those circumstances will be subject to the same probationary conditions as were imposed against the seaman's certificates or licenses in proceedings under R. S. 4450, as amended. Any such applicant must file an application for license in the usual manner, and the offense for which he was placed on probation will be considered on the merits of the case in determining his fitness to hold the license applied for.

(5) Nothing in this subpart shall be construed to permit the issuance of an original license during any period when a suspension without probation or a revocation imposed pursuant to R. S. 4450, as amended, is effective against any document held by him.

§ 10.13–19 Applicants furnishing additional information.

(a) In the course of the investigation into an applicant's qualifications (such as age, physical condition, experience, citizenship, character, and habits of

life), the Commandant may require the applicant to furnish such additional information to the Coast Guard as the Commandant deems pertinent and necessary for a determination as to whether or not the applicant is a suitable and safe person to be entrusted with the powers and duties of a radiotelegraph operator on any vessel as contemplated by the act of May 12, 1948, as amended (46 U.S.C. 220a–229h).

(b) The failure or refusal of an applicant to furnish the additional information requested by the Commandant under this section may be grounds for the Commandant's rejection of the application. However, no application will be rejected on the grounds of failure or refusal of the applicant to furnish such information unless and until the applicant shall first be afforded, before an officer of the Coast Guard, a further opportunity to furnish the requested information or to satisfactorily explain his failure or refusal to furnish such information.

§ 10.13–21 General requirements for renewal of license.

(a) *Establishing eligibility.* Applicants for renewals of licenses are charged with the duty of establishing to the satisfaction of the Coast Guard that they possess all of the qualifications necessary before they shall be issued a renewal of license.

(1) *Written application.* The Officer in Charge, Marine Inspection, shall, before granting renewal of license, require the applicant to make written application on Coast Guard Form CG–3479.

(b) *Application for renewal.* The applicant for renewal shall appear in person before an Officer in Charge, Marine Inspection, except where the applicant would be put to great inconvenience or expense to appear in person or is engaged in a service that necessitates his continuous absence from the United States. In such cases the license may be renewed by forwarding the following documents to the Officer in Charge, Marine Inspection, of the office which issued the license to be renewed:

(1) A letter of transmittal indicating reasons for not appearing in person and stating that to the best of his knowledge no physical incapacity exists, together with properly executed application on Coast Guard Form CG–3479.

(2) The oath of office on the form prescribed by the Coast Guard which has been duly executed before a person authorized to administer oaths.

(3) The license to be renewed.

(4) The currently valid license as first- or second-class radiotelegraph operator issued by the Federal Communications Commission. (This license will be sighted and returned to the applicant.)

(c) *Fitness.* No license shall be renewed if title has been permanently relinquished or facts which would render a renewal improper have come to the attention of the Coast Guard.

(d) *Period of grace.* (1) Licenses shall be renewed within 12 months after the date of expiration as shown on the license held. During this 12-month period of grace, the license is not valid.

(2) No license shall be renewed more than 90 days in advance of the date of expiration thereof, unless there are extraordinary circumstances that justify a renewal beforehand, in which case the reasons therefor must appear in detail upon the records of the Officer in Charge, Marine Inspection, renewing the license.

(e) *Surrender of expiring license.* An applicant for renewal shall surrender his license which is being renewed upon issuance of the new license.

(Sec. 2, 64 Stat. 484, 46 U.S.C. 239b; Treasury Department Order 167–9, August 3, 1954, 19 F.R. 5195)

§ 10.13–23 Physical requirements for renewal.

(a) In the event it is found that an applicant for renewal of license obviously suffers from some physical or mental infirmity to a degree that, in the opinion of the Officer in Charge, Marine Inspection, would render him incompetent to perform the ordinary duties of a radio officer at sea, the applicant shall be required to undergo an examination by a medical officer of the Public Health Service to determine his competency. If the applicant subsequently produces a certificate from the Public Health Service to the effect that his condition has improved to a satisfactory degree, or is normal, he shall be qualified in this respect.

(b) Nothing contained in this section shall debar an applicant who has lost the sight of one eye since obtaining his original license from securing a renewal of his license, provided he is qualified in all other respects, and the vision in his one eye passes the test required for the better eye of an applicant possessed of both eyes.

(c) In exceptional cases where an applicant would be put to great inconvenience or expense to appear before a medical officer of the United States Public Health Service, the physical examination or certification may be made by another reputable physician.

(d) Whenever an applicant shall apply for renewal of his license after 12 months after the date of its expiration, he shall be required to pass the physical examination required of an applicant for an original license.

§ 10.13–25 Issuance of duplicate license.

(a) Whenever a person to whom a license has been issued loses his license, he shall report such loss to an Officer in Charge, Marine Inspection, who shall issue a duplicate license after receiving from such person a properly executed affidavit giving satisfactory evidence of such loss, and a record of the license from the Marine Inspection Office where it was issued. Such license shall be issued as a duplicate by the addition of the following typewritten endorsement, "This license replaces License No. ------ issued at ------ on the above date," as well as the port and date of the duplicate issue.

(b) The duplicate license, issued for the unexpired term, shall have the same force and effect as the lost license.

(c) When a person reports the loss of his license, or when it is discovered that any license or license form has been stolen from a Marine Inspection Office or when such lost or stolen licenses are recovered, the Officer in Charge, Marine Inspection, shall immediately report the loss, theft, or recovery to the Commandant giving a description of the license and all facts incident to its loss, theft, or recovery.

§ 10.13–27 Parting with or altering license.

(a) If the holder of any license voluntarily parts with it or places it beyond his personal control by pledging or depositing it with any other person for any purpose, he may be proceeded against in accordance with the provisions of R.S. 4450, as amended (46 U.S.C. 239), looking to a suspension or revocation of his license.

(b) The holder of any license issued pursuant to the regulations in this subpart who shall change, by addition, interpolation, or erasure of any kind any license shall be subject to all the penalties provided by law; and any license so changed is null and void and without force and effect.

§ 10.13–29 Suspension and revocation of licenses.

(a) Licenses issued pursuant to this subpart shall be subject to suspension or revocation on the same ground and in the same manner and with like procedure as is provided in the case of suspension or revocation of licenses under the provisions of R. S. 4450, as amended (46 U.S.C. 239).

(b) Whenever a license is revoked such license expires with such revocation and any license subsequently granted to such person shall be considered in the light of an original license except as to number of issue.

(c) No person whose license has been suspended or revoked shall be issued another license except upon approval of the Commandant.

(d) When a license which is about to expire is suspended, the renewal of such license may be withheld until the expiration of the period of suspension.

(e) When the license issued by the Federal Communications Commission upon which the license issued pursuant to this subpart is predicated is suspended or revoked, such suspension or revocation shall operate as a suspension or revocation of the license issued under this subpart. No formal proceedings shall be required in such cases.

§ 10.13–33 Right of appeal.

Whenever any person directly interested in or affected by any decision or action of any Officer in Charge, Marine Inspection, shall feel aggrieved by such decision or action with respect to the issuance of a license, he may appeal therefrom to the District Coast Guard Commander having jurisdiction. A like appeal shall be allowed from any decision or action of the District Coast Guard Commander to the Commandant, whose action shall be final. Such appeals shall be made in writing within 30 days after

the date of decision or action appealed from. Pending the determination of the appeal, the decision of the Officer in Charge, Marine Inspection, shall remain in effect.

Subpart 10.15—Licensing of Officers for Uninspected Vessels

AUTHORITY: The provisions of this Subpart 10.15 interpret or apply R.S. 4438a, as amended; 46 U.S.C. 224a. Other statutory provisions interpreted or applied are cited to text in parentheses.

§ 10.15–1 Applicability of laws.

(a) All the provisions of Title 46, U.S. Code, sections 221, 224, 225, 226, 227, 228, 229, 231, 232, 233, 234, 235, 237, 239, 239b, 240, 372, 375, and 672a which refer to the issuance, duration, renewal, suspension or revocation of licenses of masters, mates, chief engineers and assistant engineers shall be applicable to all uninspected vessels to which the Officers' Competency Certificates Convention, 1936, and Title 46, U.S. Code, section 224a, making effective the provisions of the Convention apply.

§ 10.15–3 Vessels to which regulations apply.

(a) The regulations in this subpart shall apply to masters, chief engineers and watch officers, deck and engineer, on all uninspected vessels, however propelled, navigating the high seas, which are registered, enrolled and licensed, or licensed under the laws of the United States whether permanently, temporarily, or provisionally, including yachts, enrolled and licensed, with the exception of:

(1) Ships of war;

(2) Government vessels, or vessels in the service of a public authority, which are not engaged in trade;

(3) Wooden ships of primitive build, such as dhows and junks;

(4) Unrigged vessels;

(5) All vessels of less than 200 gross tons.

§ 10.15–5 Licenses issued and general provisions.

(a) Licenses to officers on uninspected vessels will be issued as follows:

(1) License as master, motor or sail;

(2) License as mate, motor or sail;

(3) License as chief engineer, motor; or,

(4) License as assistant engineer, motor.

(b) Licenses to officers of uninspected vessels shall be limited on their face to uninspected vessels, and shall be issued on the Coast Guard Form CG–2849.

(c) Licenses as master and mate shall be issued for appropriate route (ocean or coastwise) and with tonnage limitations commensurate with the experience of the applicant.

(d) (1) Licenses to chief engineer and assistant engineer shall be issued with appropriate horsepower limitations commensurate with the experience of the applicant.

(2) The regulations in § 10.10–15 shall govern the conversion of engineers' licenses from gross tonnage to horsepower limitations upon renewal.

(e) Every person to whom a license is issued shall place his signature and left thumbprint thereon, and upon any sheets attached for additional endorsements.

(f) Every master, mate, or engineer who receives a license shall make oath before an Officer in Charge, Marine Inspection, or commissioned officer of the Coast Guard authorized to administer oaths under 10 U.S.C. 936 or 14 U.S.C. 636, to be recorded upon his official file, that he will faithfully and honestly, according to his best skill and judgment, without concealment or reservation, perform all the duties required of him by law and obey all lawful orders of his superior officers.

§ 10.15–7 Related authority of licenses for inspected vessels.

A license to act as master, mate, or engineer of inspected vessels will in all cases entitle the holder to act under the limitations of his license on uninspected vessels.

§ 10.15–9 Sea service as member of the armed forces of the United States as qualifying.

Sea service as a member of the armed forces of the United States will be accepted as qualifying experience for an original or raise in grade of license. Such service will be subject to evaluation to the sea service otherwise required, and to determine the appropriate grade, class, and limit of license for which the applicant is eligible. The applicant may be permitted to omit the examination for the lower grade of license if his experience is of such character as to qualify him for the higher grade of license.

§ 10.15–11 Lifting of limitations.

Section 10.02–15 shall govern the lifting of limitations on licenses to officers of uninspected vessels.

§ 10.15–13 Citizenship and age requirements.

(a) No license shall be issued to any person who is not a United States citizen. An applicant claiming to be a citizen of the United States shall furnish documentary evidence of his citizenship. Acceptable evidence of citizenship is described in §10.02–5.

(b) Any citizen who has attained the age of 21 years and is qualified in all other respects shall be eligible for a license: *Provided*, That a license as mate or assistant engineer may be granted to applicants who have reached the age of 19 years and are qualified in all other respects, but no such license may be raised in grade before the holder thereof shall have reached the age of 21 years.

§ 10.15–15 Reexaminations and refusal of licenses.

Section 10.02–19 shall govern the reexaminations and refusal of licenses to officers of uninspected vessels.

§ 10.15–17 Issuance of duplicate licenses.

Section 10.02–23 shall govern the issuance of duplicate licenses to officers of uninspected vessels.

§ 10.15–19 Suspension and revocation of licenses.

Licenses as master, mate, or engineer of uninspected vessels shall be subject to suspension or revocation on the same ground and in the same manner and with like procedure as is provided in the case of suspension or revocation of licenses under the provisions of R.S. 4450, as amended (46 U.S.C. 239).

§ 10.15–21 Laws, general rules and regulations, and Rules of the Road to be furnished licensed officers.

(a) Every master, mate, or engineer, when receiving an original license, a renewed license, or a raise of grade of license, shall be furnished at his request with a copy of the "Laws Governing Marine Inspection" and a copy of the "Rules and Regulations for Vessel Inspection" distributed by the Coast Guard pertinent to the license issued.

(b) In addition, every master and mate shall be furnished at his request with a copy of the "Rules of the Road" applicable to the waters for which his license has been issued.

§ 10.15–25 Application and experience required for original or raise of grade of licenses.

(a) Applicants for original or raise of grade of licenses are charged with the duty of establishing to the satisfaction of the Coast Guard that they possess all the qualifications necessary, such as age, experience, character and citizenship, before they shall be entitled to be issued such license. Until an applicant meets this mandatory requirement, he is not entitled to be licensed. No person who has been convicted by court-martial of desertion or treason in time of war, or has lost his nationality for any of the other reasons listed in 8 U.S.C. 1481, is eligible for a license. Neither is a person eligible for a license, who has been convicted by a court of record of a violation of the narcotic drug laws of the United States, the District of Columbia, or any State or Territory of the United States, within ten years prior to the date of filing the application; or who unless he furnishes satisfactory evidence that he is cured, has ever been the user of or addicted to the use of a narcotic drug.

(b) Before an applicant for original license (as defined by § 10.02–3) as master, mate, or engineer, or raise of grade of any license may be licensed, the applicant shall make application upon Coast Guard Form CG–866 and shall present it in person to an Officer in Charge, Marine Inspection. An applicant shall also present discharges and testimonial letters to the Officer in Charge, Marine Inspection, from the masters or chief engineers under whom he has served, or from the owners in the case of applicants who have already served as master or chief engineer, certifying to the name of the vessel, and the amount and character of his experience, and to his ability, character, and habits of life. Photostatic copies of those documents may be accepted for filing with the application.

(c) (1) Fingerprint records on FBI Form "Applicant" shall be submitted to

the Commandant on each application for original license at the same time application is made.

(2) The application of any person may be rejected by the Officer in Charge, Marine Inspection, when derogatory information has been brought to his attention which indicates that the applicant's habits of life and character are such as to warrant the belief that he cannot be entrusted with the duties and responsibilities of the station for which he made application. In the event that an applicant is rejected he will be advised that he may submit a request to the Commandant for a review of his case. No examination shall be given or temporary permit issued in the type case pending the Commandant's authorization.

(3) Nothing in this part shall be construed to permit an applicant to be examined for an original license or a raise in grade of license during any period when a suspension without probation or a revocation imposed pursuant to R. S. 4450, as amended, is effective against his license or certificate.

(d) No original license or raise of grade shall be issued to any applicant unless at least 1 year of his qualifying service shall have been obtained within the 3 years next preceding his application for examination.

(e) Applicants will be informed as soon as possible whether their applications have been accepted or not, and when the application of any person for a license has been approved the applicant shall be given the required examination as soon as practicable.

(f) Licensed officers entitled to raise of grade shall have issued to them new licenses for the grade for which they are found qualified. The license which is raised in grade shall be surrendered to the Officer in Charge, Marine Inspection.

(g) Except for applicants for licenses as masters, mates, chief engineers, and assistant engineers of fishing vessels, certificates from the Public Health Service attesting to the applicant's knowledge of ship sanitation and first aid will be required before the candidates are eligible for original licenses.

(Sec. 2, 64 Stat. 484; 46 U.S.C. 239b. Treasury Department Order 167-9, August 3, 1954, 19 F.R. 5195)

§ 10.15-27 Physical examination required for original and raise of grade of licenses.

Sections 10.02-5 and 10.02-7 governing the physical examination requirements for applicants for original and raise of grade of licenses for inspected vessels shall apply to applicants for original and raise of grade of licenses for uninspected vessels for the same types of licenses.

§ 10.15-29 Professional requirements for original and raise of grade of licenses.

(a) For license as master or chief engineer, a candidate must have served 4 years at sea, on deck or in the engine room, respectively, of which 1 year must have been as licensed mate or assistant engineer, respectively, except as otherwise provided in the regulations in this subpart.

(b) For license as mate or assistant engineer, a candidate must have served 3 years at sea, on deck or in the engineroom, respectively.

(c) For a license as assistant or chief engineer of motor vessels, two-thirds of the required service must have been served on motor vessels.

(d) It is not required that an applicant must have obtained his experience on United States vessels. Experience on foreign vessels will be given due credit.

(e) Experience in towed barges fitted with sails and rigging is not considered as sail vessel time.

(f) When an applicant presents evidence of service or experience which does not meet the specific requirements of the regulations in this part, but which in the opinion of the Officer in Charge, Marine Inspection, is a reasonable equivalent thereto, the application for license with supporting data shall be submitted to the Commandant for evaluation, together with the recommendation of the Officer in Charge, Marine Inspection.

§ 10.15-31 Examination requirements for licenses.

(a) *General.* The examinations given by the Coast Guard will be practical, not theoretical. They will be written, where possible, and if an oral examination is necessary, it shall be taken down in writing. The examination for licenses limited to fishing vessels shall be oral only.

(b) *Master.* Candidates for license as master will, in addition to the subjects given in the examination for mate, be required to understand and give satisfactory explanations of:

(1) Navigation, including:

(i) Latitude by altitude of Polaris.

(ii) Elementary questions on compass deviation.

(2) Rudimentary seamanship, including:

(i) Meteorology, use and reading of weather bulletins.

(ii) Getting underway.

(iii) Tending vessel at anchor; mooring and unmooring.

(iv) Keeping a ship's head to sea in heavy weather with engines broken down.

(v) How to rig a jury rudder.

(vi) Action to be taken in the event of springing a leak.

(vii) Cast of lead in heavy weather.

(c) *Mate.* Candidates for license as mate will be required to understand and give satisfactory explanations of:

(1) Navigation, including:

(i) Variation, deviation of the compass, and simple methods of determining the deviation by the means of ranges, and by bearings of the sun.

(ii) Use of a chart and the meaning of the various signs and abbreviations thereon; method of determining and laying off compass courses and distances on a chart, and allowing for set and drift; fixing the ship's position by cross bearings of two objects; or by two bearings of the same object.

(iii) The traverse tables and a day's work in its simplest form.

(iv) Determining of latitude by meridian altitude of the sun.

(v) Longitude by position line or by time sight of the sun.

(vi) The use and adjustments of the sextant.

(vii) The use and reading of the aneroid barometer.

(2) Rudimentary seamanship, including:

(i) The use and construction of a sea anchor.

(ii) The marking and use of the lead line.

(iii) Man reported overboard.

(iv) Handling of a vessel's boat in heavy weather.

(v) Elementary first aid.

(3) The Rules to Prevent Collisions of Vessels including both the International Rules and the Pilot Rules for Inland Waters. Particular attention will be given to the steering and sailing rules, although inability to repeat them verbatim will not entail failure: *Provided,* That the candidate understands their full significance, content, and practical application. Models will be used to test the candidate's judgment and ability to act correctly and promptly.

(4) Distress signals and use of line-throwing apparatus.

(5) Buoyage system and aids to navigation.

(6) Precautions to be taken against fire, explosions from oil or gas, and spontaneous combustion. Methods of dealing with fire and use of fire extinguishers, handling of vessels after fire is discovered.

(7) Candidates for a sailing ship license will also be asked questions on the taking in and setting of fore and aft sail, and applicable questions relating to the handling of a sail vessel.

(d) *Chief engineer.* A candidate for license as chief engineer, motor, will be required to have an advanced and more complete knowledge of the subjects and problems than required for the examination for an assistant engineer.

(e) *Assistant engineer.* A candidate for license as assistant engineer, motor, will be required to understand and give satisfactory explanations of:

(1) The various codes of signals used between the bridge and engineroom for working the engine.

(2) The fundamentals of oil, gas, or other internal combustion engines, and also the auxiliary machinery in use on board ship; and to show a practical knowledge of upkeep of, operation of, and repairs to same.

(3) The use of the various gauges, meters, and instruments.

(4) Treatment of a hot bearing and avoidance of same.

(5) The use of fire-extinguishing apparatus; precautions to be taken against fire or explosions from oil or gas, precautions to be taken against the formation of explosive gases in oil tanks, bilges, or other unventilated spaces, causes of spontaneous combustion; safe carriage of fuels, and storage of lubricating oils; and methods of dealing with fire.

(6) Properties of the various oils, etc., generally used in internal combustion engines.

§ 10.15–33 Requirements for renewal of licenses.

Section 10.02–9 shall govern the renewal of licenses to officers of uninspected vessels.

Subpart 10.20—Motorboat Operators' Licenses

AUTHORITY: The provisions of this Subpart 10.20 interpret or apply secs. 7, 17, 54 Stat. 165, as amended, 166, as amended; 46 U.S.C. 526f, 526p. Treasury Department Order 167–20, June 18, 1956, 21 F.R. 4894, unless otherwise noted.

§ 10.20–1 General application.

(a) The regulations in this subpart apply to all applicants for license to operate motorboats, or other vessels of fifteen gross tons or less propelled by machinery other than steam, while carrying six or less passengers for hire.

§ 10.20–3 General requirements.

(a) Any person who has attained the age of 18 years and is qualified in all other respects, shall be considered eligible for a motorboat operator's license and may be examined by the Coast Guard.

(1) An applicant for a license as a motorboat operator shall submit satisfactory documentary evidence of at least one year's experience in the operation of motorboats.

(2) An applicant for a motorboat operator's license must demonstrate his ability to speak, read and understand English as found in the Rules of the Road, aids to navigation publications, emergency equipment instructions and machinery instructions.

(3) An applicant for a motorboat operator's license to operate motorboats, or other vessels of fifteen gross tons or less propelled by machinery other than steam, on the navigable waters of the United States in the vicinity of Puerto Rico, who speaks Spanish only, will be issued a license restricted to those waters.

(b) (1) Fingerprint records on FBI Form "Applicant" shall be submitted to the Commandant on each applicant at the same time application is made for original license.

(2) The application of any person may be rejected by the Officer in Charge, Marine Inspection, when derogatory information has been brought to his attention which indicates that the applicant's habits of life and character are such as to warrant the belief that he cannot be entrusted with the duties and responsibilities of the station for which he made application. In the event that an applicant is rejected he will be advised that he may submit a request to the Commandant for a review of his case.

(3) No examination shall be given or temporary permit issued in the case pending the Commandant's authorization.

(4) No person shall be eligible for a motorboat operator's license, who has been convicted by a court of record of a violation of the narcotic drug laws of the United States, the District of Columbia, or any State or Territory of the United States, within ten years prior to date of filing the application; or who, unless he furnishes satisfactory evidence that he is cured, has ever been the user of or addicted to the use of a narcotic drug.

(c) An applicant for a license as an operator shall submit an application on Coast Guard Form CG–866 to the Officer in Charge, Marine Inspection. If the applicant's capacity, knowledge, experience, character and habits of life are such as to warrant entrusting him with the duties and responsibilities involved in the operation and navigation of motorboats, or other vessels of fifteen gross tons or less propelled by machinery other than steam, carrying passengers for hire, a license authorizing him to discharge such duties on any such motorboats or vessels for a term of five years shall be issued to him.

(d) Every person to whom a license is issued shall place his signature and left thumb print thereon.

(e) An Officer in Charge, Marine Inspection, may place restriction or limitation upon a license as motorboat operator. Such limitation shall be commensurate with the qualifications of the applicant.

(Sec. 2, 68 Stat. 484; 46 U.S.C. 239b. Treasury Department Order 167–9, August 3, 1954, 19 F.R. 5195)

§ 10.20–5 Professional examinations.

(a) The applicant shall be examined orally concerning his fitness to hold a license as motorboat operator.

(b) (1) The examination will consist of questions on the following:

(i) Regulations governing motorboats, and other vessels of fifteen gross tons or less propelled by machinery other than steam, and the collision regulations applicable to the waters over which the applicant operates.

(ii) Fire protection and extinguishment.

(iii) Lifesaving equipment.

(iv) The operation of propelling machinery, and, particularly, the safe and proper handling of gasoline motors.

(v) The proper method of operating and navigating motorboats, and other vessels of fifteen gross tons or less propelled by machinery other than steam, carrying passengers.

(vi) Simple firstaid.

(2) Although applicants will be examined only in the collision regulations applicable to the waters upon which they are operating, it will be incumbent upon them, should they at any time operate on waters for which the collision regulations differ, to familiarize themselves with the appropriate rules.

(c) If the applicant has operated motorboats under the license issued under the act of June 9, 1910, he shall be held to possess the required experience but must qualify in all other respects.

§ 10.20–7 Physical examination requirements.

(a) (1) An applicant shall be examined by a United States Public Health Service Medical Officer or other reputable physician to determine whether he is physically fit to perform the duties required of him and shall include the eyesight, hearing, and physical condition. Epilepsy, insanity, senility, acute venereal disease, neurosyphilis, or badly impaired hearing, eyesight, or color blindness are causes for rejection.

(2) For an original license the applicant must have, either with or without glasses, at least 20/20 vision in one eye and at least 20/40 in the other. Any applicant who wears glasses, however, must also be able to pass a test without glasses of at least 20/40 in one eye and at least 20/70 in the other. The color sense will be tested by means of a pseudo-isochromatic plate test, but any applicant who fails this test will be eligible if he can pass the "Williams" lantern test or equivalent, but if found color blind no license will be issued except in a case where the applicant shows he has operated motorboats for many years and has particular qualifications, which in the judgment of the Officer in Charge, Marine Inspection, qualifies him to operate a motorboat in daylight only and so restricts the license.

(3) For a renewal of a motorboat operator's license an examination may be required in addition to a certificate of satisfactory color sense. Nothing herein shall debar an applicant who has lost the sight of one eye while holding a license from renewing such license if he is qualified in all other respects and the vision in his one eye passes the test required for the better eye of an applicant possessed of both eyes. If an applicant for a renewal of license is pronounced color blind, the Officer in Charge, Marine Inspection, may grant him a license limited to service during daylight only.

(4) Where an applicant is not possessed of the vision, hearing, or general physical condition necessary, the Officer in Charge, Marine Inspection, after consultation with the Public Health Service physician or other examining physician, may make recommendation to the Commandant for an exception to these requirements, if in his opinion, extenuating circumstances warrant special consideration. Any requests for a decision by the Commandant must be accompanied by all pertinent correspondence, records, and reports. In this connection recommendations from agencies of the Federal Government operating Government vessels, as well as owners and operators of private vessels, made in behalf of their employees, will be given full consideration in arriving at a decision.

(b) An applicant who has operated a motorboat carrying passengers for hire under authority of a license issued prior to April 25, 1941, may be issued an operator's license without further physical examination unless the Officer in Charge, Marine Inspection, considers that such examination is necessary in view of apparent disabilities.

§ 10.20–9 Requirements for renewal.

(a) An operator's license may be renewed by application to an Officer in Charge, Marine Inspection. The pres-

entation of the license to be renewed, together with satisfactory certificate of color sense, shall be considered sufficient evidence upon which to renew a license; unless facts shall have come to the knowledge of the Officer in Charge, Marine Inspection, which would render a renewal improper in the case of a particular applicant.

(1) *Written application.* The Officer in Charge, Marine Inspection, shall, before granting renewal of license, require the applicant to make written application on Coast Guard Form CG–3479.

(b) No license shall be renewed more than 90 days in advance of the date of the expiration thereof, unless there are extraordinary circumstances that shall justify a renewal beforehand in which case the reasons therefor must appear in detail upon the records of the Officer in Charge, Marine Inspection, renewing the license.

(c) Whenever an operator shall apply for renewal of his license more than 1 year after the date of its expiration, he shall be required to pass a professional and physical examination of such length and scope as may be required by the Officer in Charge, Marine Inspection, to determine the applicant's continued qualifications.

(d) Where an applicant for renewal would be put to great inconvenience or expense to appear in person before an Officer in Charge, Marine Inspection, the license may be renewed by forwarding the documents required by the regulations in paragraph (a) of this section to the Officer in Charge, Marine Inspection, who issued the license to be renewed.

(Sec. 2, 68 Stat. 484; 46 U.S.C. 239b. Treasury Department Order 167–9, August 3, 1954, 19 F.R. 5195)

§ 10.20–11 Issuance of duplicate license.

Section 10.02–23 shall govern the issuance of duplicate motorboat operators' licenses.

§ 10.20–13 Suspension or revocation of license.

Motorboat operators' licenses shall be subject to suspension or revocation on the same grounds and with like procedure as is provided in the case of suspension or revocation of licenses under the provisions of R. S. 4450, as amended (46 U. S. C. 239).

Subpart 10.25—Registration of Staff Officers

AUTHORITY: The provisions of this Subpart 10.25 interpret or apply sec. 7, 53 Stat. 1147, as amended; 46 U.S.C. 247, unless otherwise noted.

§ 10.25–1 Application of regulations.

This subpart shall govern the registration of staff officers for employment on every vessel registered, enrolled, or licensed under the laws of the United States which employs a staff officer, except vessels navigating on bays, sounds, rivers, inland waterways, and lakes other than the Great Lakes, passenger ferries and car ferries navigating on the Great Lakes, fishing vessels, whaling vessels, and yachts.

§ 10.25–3 Grades of certificates issued.

Staff Officers shall be registered in the following grades:

(a) Chief purser.
(b) Purser.
(c) Senior assistant purser.
(d) Junior assistant purser.
(e) Surgeon.
(f) Professional nurse.

(Sec. 1, 53 Stat. 1145; 46 U.S.C. 242)

§ 10.25–5 Staff department defined.

(a) The staff department shall consist of officers registered under the provisions of this subpart, pursers' clerks, and such persons as may be assigned to the senior registered surgeon.

(b) The staff department shall be a separate and independent department composed of a medical division and a purser's division. The medical division shall be under the charge of the senior registered surgeon who shall be responsible solely to the master or, in the absence of the master, to the officer in charge of the vessel.

§ 10.25–7 General requirements.

(a) The applicant for a certificate of registry shall make a written application on Coast Guard Form 866 in duplicate. This application shall be made to an appropriate Officer in Charge, Marine Inspection, having jurisdiction over a seaport or a Great Lakes port.

(b) The first certificate of registry issued to any person shall be considered an original certificate of registry.

(c) An applicant for certificate of registry must be a citizen of the United States and shall submit satisfactory evidence of citizenship. Acceptable evidence of citizenship is set forth in § 10.02–5.

(d) An applicant for registry and a certificate of registry as staff officer shall not be required to take an examination, but he shall be required to submit with his application satisfactory proof of his good character and of his prior service, including at least two letters of recommendation from present or former employers. No person shall be eligible for a certificate of registry, who has been convicted by a court of record of a violation of the narcotic drug laws of the United States, the District of Columbia, or any State or Territory of the United States, within ten years prior to the date of filing the application; or who, unless he furnishes satisfactory evidence that he is cured, has ever been the user of or addicted to the use of a narcotic drug.

(e) (1) Fingerprint records on FBI Form "Applicant" shall be submitted to the Commandant on each applicant at the same time application is made.

(2) The application of any person may be rejected by the Officer in Charge, Marine Inspection, when derogatory information has been brought to his attention which indicates that the applicant's habits of life and character are such as to warrant the belief that he cannot be entrusted with the duties and responsibilities of the station for which he made application. In the event that an applicant is rejected he will be advised that he may submit a request to the Commandant for a review of his case.

(3) No temporary permit shall be issued in a case where the Commandant's review is pending.

(f) No original certificate of registry will be issued to any applicant unless the applicant presents evidence of commitment of employment as a member of the crew of a United States merchant vessel in a capacity covered by such certificate.

(g) (1) An applicant for registry and a certificate of registry as staff officer shall be in possession of a continuous discharge book or certificate of identification or merchant mariner's document issued as a certificate of identification and shall appear in person before an Officer in Charge, Marine Inspection.

(2) The applicant shall furnish two unmounted, dull finish photographs, 2 inches by 1½ inches, of passport type taken within 1 year of the application. Photographs shall show the full face, at least 1 inch in height, with the head uncovered, and shall be a satisfactory likeness of the applicant. The issuing officer shall affix a photograph to each of the applications and impress his official seal partly over the photograph, after the applicant has in his presence signed the application.

(3) The applicant shall place his fingerprints on each of the applications and his left thumb print on the back of the certificate of registry as staff officer.

(4) A staff officer shall not be required to hold any other certificate of service or efficiency as a condition of service in such capacity on vessels.

(h) An Officer in Charge, Marine Inspection, shall issue a certificate of registry as staff officer to an applicant who has qualified for such certificate and who has made oath or affirmation before him, or a commissioned officer of the Coast Guard authorized to administer oaths under 10 U.S.C. 936 or 14 U.S.C. 636, that he will faithfully and honestly perform all the duties of his office required of him by law.

(i) Endorsements for a higher grade shall not be made on certificates of registry. An applicant for a higher grade in the staff department shall make application in the same manner as for an original certificate of registry and shall surrender his certificate upon issuance of the new certificate of registry. A person in possession of a certificate of registry as staff officer may serve in a lower grade than that for which he is registered.

(j) Certificates of registry issued to staff officers shall be suspended or revoked in the same manner and with like procedure as is provided in the case of suspension or revocation of licenses of officers under the provisions of R. S. 4450, as amended (46 U. S. C. 239).

(k) No person whose certificate of registry is under suspension or revoked shall be issued another certificate of registry except upon approval of the Commandant. If an applicant for a certificate of registry is currently suffering the suspension or revocation of a license or certificate of service, the certificate of registry for which he applies shall not be issued except upon approval of the Commandant.

(l) Any person whose certificate of registry has been stolen, lost or destroyed shall report that fact to an Officer in Charge, Marine Inspection, as soon as possible, and if a duplicate certificate is desired, a properly executed application on Coast Guard Form CG–719–E, giving satisfactory evidence of such loss shall be furnished an Officer in Charge, Marine Inspection, along with one photograph as required in the case of an application for an original certificate. The Officer in Charge, Marine Inspection, shall transmit the application and photograph to Coast Guard Headquarters, and the Commandant shall cause to be prepared a certificate which will be similar to the former certificate, bear the same book or identification number as the former certificate and will be marked "Duplicate."

(m) Whenever a certificate of registry is reported to an Officer in Charge, Marine Inspection, as having been stolen, lost, or destroyed, the Officer in Charge, Marine Inspection, shall immediately report the fact by letter to the Commandant giving all the facts incident to its loss or destruction. By the same procedure, he shall report the recovery of any certificate of registry, together with all facts incident to its recovery, and shall forward the recovered certificate to the Commandant.

(n) Staff officers who are members of the Naval Reserve Corps, shall wear on their uniforms such special distinguishing insignia as may be approved by the Secretary of the Navy.

(o) The uniform stripes, decorations, or other insignia shall be of gold braid or woven gold or silver material, and no member of the ship's crew other than such staff officers shall be allowed to wear any uniform with such staff officers' identifying insignia.

(Sec. 2, 68 Stat. 484; 46 U.S.C. 239b. Treasury Department Order 167–9, August 3, 1954, 19 F.R. 5195)

CROSS REFERENCE: See 33 CFR 1.25–65 for the fee for a duplicate certificate of registry as staff officer.

§ 10.25–9 Experience requirements.

(a) The applicant for registry and a certificate of registry as staff officer shall submit evidence of experience as follows:

(1) *Chief purser.* Two years' service aboard vessels performing duties relating to work in the purser's office.

(2) *Surgeon.* A valid license as physician and surgeon issued under the authority of a State or Territory of the United States, the Commonwealth of Puerto Rico, or the District of Columbia.

(3) *Purser.* One year's service aboard vessels performing duties relating to work in the purser's office.

(4) *Senior assistant purser.* Six months' service aboard vessels performing duties relating to work in purser's office.

(5) *Junior assistant purser.* Previous experience not required.

(6) *Professional nurse.* A valid license as a registered nurse issued under authority of a State or Territory of the United States, the Commonwealth of Puerto Rico, or the District of Columbia.

(b) Employment on shore in connection with ship's business may be accepted in lieu of service aboard vessels. Such shore employment shall be accepted in the ratio of 2 months' shore service to count as 1 month's service aboard vessels.

(c) In computing the length of service required of an applicant, service of 1 season on vessels on the Great Lakes shall be counted as service of 1 year.

(d) In the event an applicant presents other special qualifications which, in the opinion of the Officer in Charge, Marine Inspection, fit him for the duties of a staff officer, other than surgeon, the Officer in Charge, Marine Inspection, shall forward full details and description of such qualifications to Coast Guard Headquarters for the decision of the Commandant prior to the registry and issuance of certificate of registry.

(Sec. 2, 53 Stat. 1146; 46 U.S.C. 243)

PART 12—CERTIFICATION OF SEAMEN

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AUTHORITY: The provisions of this Part 12 issued under R.S. 4405, as amended, 4462, as amended; 46 U.S.C. 375, 416. Interpret or apply R.S. 4417a, as amended, 4488, as amended, 4551, as amended, sec. 13, 38 Stat. 1169, as amended, secs. 1, 2, 7, 49 Stat. 1544, 1545, as amended, 1936, as amended, sec. 3, 54 Stat. 347, as amended, secs. 2, 3, 68 Stat. 484, 675; 46 U.S.C. 391a, 481, 643, 672, 367, 689, 1333, 239b, 50 U.S.C. 198. Treasury Department Orders 120, July 31, 1950, 15 F.R. 6521; 167–9, Aug. 3, 1954, 19 F.R. 5195; 167–14, Nov. 26, 1954, 19 F.R. 8026; 167–38, Oct. 26, 1959, 24 F.R. 8857, unless otherwise noted.

Subpart 12.01—General

§ 12.01–1 Purpose of regulations.

(a) The purpose of the regulations in this part is to provide a comprehensive and adequate means of determining the identity or the qualifications an applicant must possess in order to be eligible for certification to serve on merchant vessels of the United States.

§ 12.01–5 Authority for regulations.

(a) *General.* The authority to prescribe regulations generally is set forth in R. S. 4405 and 4462, as amended (46 U. S. C. 375, 416), and sec. 7 of the act of June 25, 1936, as amended (49 Stat. 1936; 46 U. S. C. 689), as well as in other provisions of Titles 52 and 53 of the Revised Statutes and acts amendatory thereof or supplemental thereto. Under the provisions of R. S. 4403, as amended (46 U. S. C. 372), the Commandant, United States Coast Guard, superintends the administration of the vessel inspection laws and is required to produce a correct and uniform administration of the inspection laws, rules, and regulations. Under the provisions of section 2 of the act of July 5, 1885 (23 Stat. 118, 46 U. S. C. 2), the Commandant, United States Coast Guard, and the Commissioner of Customs, Bureau of Customs, have general superintendence of the commercial marine and merchant seamen of the United States, so far as vessels and seamen are not, under the existing laws, subject to the supervision of any other officer of the Government.

(b) *Certification of seamen.* The regulations regarding requirements for certification of seamen interpret or apply R. S. 4551, as amended, sec. 13, 38 Stat. 1169, as amended by sec. 1, 49 Stat. 1930, and secs. 1, 2, 50 Stat. 199, and modified by 52 Stat. 753, 55 Stat. 579, and 55 Stat. 732; and sec. 3, 68 Stat. 675; 46 U. S. C. 643, 672, 672b, 672–1, 672–2, 50 U. S. C. 198.

(c) *Lifeboatman.* The regulations regarding lifeboatman interpret or apply R. S. 4417a and 4488, as amended

(46 U. S. C. 391a, 481), and sec. 3, 68 Stat. 675 (50 U.S.C. 198).

(d) *Tankerman.* The regulations regarding tankerman interpret or apply R. S. 4417a, as amended (46 U. S. C. 391a), and sec. 3, 68 Stat. 675 (50 U.S.C. 198).

Subpart 12.02—General Requirements for Certification

§ 12.02–3 Where documents are issued.

(a) Certificates of identification, certificates of service, certificates of efficiency, and continuous discharge books are issued to applicants qualifying therefor at any Marine Inspection Office of the Coast Guard during usual business hours.

(b) (1) Coast Guard Merchant Marine Details abroad are authorized to conduct examinations for up-grading of seamen, but are not prepared to conduct the physical examination where required. Merchant Marine Details will therefore not issue regular certificates, but temporary permits in lieu thereof. Merchant Marine Details will instruct the recipient of each temporary permit to present it to the Officer in Charge, Marine Inspection, upon arrival in the first port in the United States in which a Marine Inspection Office is located in order to exchange it for a permanent certificate.

(2) The temporary permit shall be accepted in a Marine Inspection Office as proof that the bearer has complied with the rules and regulations governing the issuance of certificates, except as noted in the body of the temporary permit. The requirements noted in the exceptions will be complied with as in the case of other applicants.

(3) The written examinations are forwarded to the Commandant by Merchant Marine Details, and any Marine Inspection Office at which an applicant with a temporary permit appears may request and obtain the examination in the case from the Commandant. Any Marine Inspection Office which doubts the propriety of issuing a permanent certificate in lieu of a temporary permit which has been issued by a foreign Merchant Marine Detail shall inform the Commandant fully as to the circumstances.

§ 12.02–4 Basis for denial of documents.

No certificate of identification, certificate of service, certificate of efficiency nor continuous discharge book shall be issued to any person who, within ten years prior to the date of filing the application, has been convicted in a court of record of a violation of the narcotic drug laws of the United States, the District of Columbia, or any State or Territory of the United States; or who, unless he furnishes satisfactory evidence that he is cured, has ever been the user of or addicted to the use of a narcotic drug.

(Sec. 1, 68 Stat. 484; 46 U. S. C. 239a)

§ 12.02–5 Form in which documents are issued.

(a) Every certificate of service, certificate of efficiency, or certificate of identification issued or reissued after November 1, 1945, shall be in the form of a merchant mariner's document, Coast Guard Form CG–2838, and wherever such certificates are mentioned in this part they shall be deemed to include merchant mariner's documents representing such certificates.

(b) Continuous discharge books are issued on Coast Guard Form CG–719.

§ 12.02–7 When documents are required.

(a) Every seaman employed on any merchant vessel of the United States of 100 gross tons or upward, except vessels employed exclusively in trade on the navigable rivers of the United States, shall be issued, at the option of the seaman, a continuous discharge book, a certificate of identification, or merchant mariner's document representing such certificate of identification, which shall be retained by him. This book or certificate of identification or merchant mariner's document will bear a number, and this same number shall be shown on all certificates of service or efficiency issued to the holder of the book or certificate or document. Provisions of this section are not applicable to unrigged vessels except seagoing barges and certain tank barges.

(b) Every seaman, as referred to in paragraph (a) of this section, shall produce a continuous discharge book or certificate of identification or merchant mariner's document representing such a certificate to the United States shipping commissioner before signing Articles of Agreement, and where the seaman is not signed on before a shipping commissioner, one of these documents shall be exhibited to the master of the vessel at the time of his employment. Seamen who do not possess one of these documents may be employed at a foreign port or place.

(c) (1) Every person employed on any merchant vessel of the United States of 100 gross tons and upward, except those navigating rivers exclusively and the smaller inland lakes, below the rank of licensed officer and registered staff officer, shall possess a valid certificate of service, or merchant mariner's document representing such certificate, issued by an Officer in Charge, Marine Inspection.

(2) No certificate of service or efficiency is required of any person below the rank of licensed officer employed on any unrigged vessel except seagoing barges and certain tank barges.

(3) No certificate of service or efficiency is required of any person below the rank of licensed officer employed on any sail vessel of less than 500 net tons while not carrying passengers for hire and while not operating outside the line dividing inland waters from the high seas, as defined in section 2 of the act of February 19, 1895, as amended (33 U.S.C. 151) and in 33 CFR Part 82.

§ 12.02–9 Application for documents.

(a) An applicant for a certificate of service, certificate of efficiency, certificate of identification, continuous discharge book, or merchant mariner's document, shall make written application, in duplicate, on Coast Guard Form CG–719–b and shall appear in person before an Officer in Charge, Marine Inspection, or other person authorized to issue documents. The placing of fingerprints on the application shall be optional with the seaman. This application may be for the certificates or the rating endorsement for which the seaman believes he is qualified. In the case of a seaman applying for his first certificate, other than certificate of identification, the application shall include a request for either a continuous discharge book or a merchant mariner's document representing a certificate of identification, at the option of the applicant.

(b) (1) When the application is submitted for a certificate of identification, certificate of service, certificate of efficiency, merchant mariner's document, or any combination thereof, or a continuous discharge book, the seaman shall furnish three unmounted dull finish photographs of passport type (2 inches by 1½ inches) taken within one year and showing the full face at least one inch in height with head uncovered.

(2) When the application requests a continuous discharge book in addition to a certificate of service or certificate of efficiency or merchant mariner's document one additional photograph shall be furnished.

(c) An applicant for a document where sea service is required shall produce with his application discharges or other documentary evidence of his service, indicating the name of the vessels and dates on which he has had service, in what capacity, and on what waters.

(d) If the applicant possesses a continuous discharge book, certificate of identification, or merchant mariner's document representing such certificate, it shall be exhibited at the time of making application for any other document.

§ 12.02–10 Applications for documents from aliens.

(a) No application from an alien for a certificate of service, certificate of efficiency, certificate of identification, continuous discharge book, or merchant mariner's document shall be accepted unless the alien presents acceptable documentary evidence from the United States Immigration and Naturalization Service that he is lawfully admitted to the United States for permanent residence.

(b) This evidence may be in the form of an alien registration receipt card issued by the Immigration and Naturalization Service bearing the certification that the alien was admitted to the United States as an immigrant, or a declaration of intention to become a citizen of the United States issued by a naturalization court.

§ 12.02–11 General provisions respecting merchant mariner's documents.

(a) As provided in § 12.02–5, every certificate of service, certificate of efficiency, or certificate of identification issued or reissued shall be in the form of a merchant mariner's document, Coast Guard Form CG–2838.

(b) Any licensed officer or unlicensed seaman currently holding, in a valid status, any of the documents listed in paragraph (a) of this section may, upon request and without examination, be issued a merchant mariner's document.

(c) A merchant mariner's document shall be a certificate of service authorizing the holder to serve in any rating endorsed thereon, or in any lower rating in the same department, or in any rating covered by a general endorsement thereon.

(d) (1) A merchant mariner's document issued to a licensed deck officer will be endorsed for, "any unlicensed rating in the deck department except able seaman," and will be a certificate of service authorizing the holder to serve in any unlicensed capacity in the deck department except able seaman without being required to present his license. If a licensed deck officer qualifies as able seaman the merchant mariner's document will be endorsed, "any unlicensed rating in the deck department including able seaman," and such endorsement will be deemed to include a certificate of efficiency as lifeboatman.

(2) A merchant mariner's document issued to an engineer officer licensed for inspected vessels of over 2,000 horsepower will be endorsed for "any unlicensed rating in the engine department," and will be a certificate of service authorizing the holder to serve in any unlicensed capacity in the engine department without being required to present his license. If a licensed engineer qualifies as a lifeboatman, the further endorsement, "lifeboatman," will be placed on the merchant mariner's document.

(3) A merchant mariner's document issued to a licensed radio officer will be endorsed as follows: "See License as Radio Officer." If a licensed radio officer qualifies as lifeboatman, the further endorsement, "Lifeboatman," will be placed on the merchant mariner's document. Qualifications for other ratings for which a radio officer is eligible may also be endorsed on the document.

(e) (1) A merchant mariner's document issued to a staff officer will be endorsed as follows: "See Certificate of Registry." The holder of a certificate of registry as chief purser, purser, senior assistant purser, or junior assistant purser may also serve in any capacity in the staff department not requiring a certificate of registry without obtaining an additional endorsement on his merchant mariner's document.

(2) The authorized holder of any valid merchant mariner's document, however endorsed, may serve in any capacity in the staff department of a vessel, except in those capacities requiring registered staff officers: *Provided*, That whenever such service includes the handling of food no person may be so employed unless his document bears the food handler's endorsement "(F.H.)."

(f) A merchant mariner's document endorsed as able seaman or as lifeboatman shall be a certificate of efficiency as lifeboatman.

(g) Every merchant mariner's document shall be a certificate of identification unless the holder also holds a continuous discharge book. The holder of a certificate of identification in the form issued before November 1, 1945, shall surrender that certificate before he is issued a merchant mariner's document.

§ 12.02–13 Citizenship requirements.

(a) Any person making application for a continuous discharge book or a certificate of identification or a merchant mariner's document representing a certificate of identification and claiming to be a citizen of the United States shall present acceptable evidence of such citizenship at the time of making application. No original document shall be issued to any person claiming to be a citizen of the United States until such citizenship is established by acceptable evidence.

(b) Any person who has been issued a continuous discharge book or certificate of identification or merchant mariner's document showing question marks prior to the effective date of this section may at any time produce additional evidence of citizenship to a shipping commissioner or Officer in Charge, Marine Inspection. If the additional evidence produced satisfies the shipping commissioner or the Officer in Charge, Marine Inspection, to whom it is presented that the same is acceptable evidence of the citizenship of the person, such official may draw lines through the question marks and note the citizenship of the person in the space provided therefor, attesting the change, or reissue the certificate or document. Whenever such changes are made the official making the change shall immediately thereafter notify the Commandant.

(c) Acceptable evidence of citizenship is set forth in § 10.02–5 of this subchapter.

§ 12.02–14 Nationality of aliens.

(a) Any alien making application for a continuous discharge book or certificate of identification or merchant mariner's document representing a certificate of identification shall present acceptable evidence of nationality at the time of making application. No original document shall be issued to any alien until nationality is established by acceptable evidence.

(b) Any document of an official character showing the country of which the alien is a citizen or subject may be accepted as acceptable evidence of an alien's nationality. The following are examples of such a document:

(1) Declaration of intention to become a citizen of the United States made by the alien after 1929.

(2) A travel document in the nature of a passport issued by the government of the country of which the alien is a citizen or subject.

(3) A certificate issued by the consular representative of the country of which the alien is a citizen or subject.

(c) Should any doubt arise as to whether or not the document presented may be considered as acceptable evidence of the alien's nationality, the matter shall be referred to the Commandant for decision.

§ 12.02–15 Oath requirement.

An applicant for a certificate of service for any rating shall take oath before an Officer in Charge, Marine Inspection, or other official authorized to give such oath, or a commissioned officer of the Coast Guard authorized to administer oaths under 10 U.S.C. 936 or 14 U.S.C. 636, that he will faithfully and honestly perform all the duties required of him by law and carry out all lawful orders of his superior officers on shipboard.

§ 12.02–17 Rules for the preparation and issuance of documents.

(a) Upon application of any person for a certificate of service or efficiency, or merchant mariner's document, any required examination will be given as soon as practicable.

(b) Upon satisfactory completion of any required examination the Officer in Charge, Marine Inspection, shall issue the appropriate document to the applicant.

(c) Before the delivery of the document the seaman shall affix his signature on the document and shall impress his left thumbprint on the back of the document. When the seaman has no left thumb, the imprint of the right thumb may be used and that fact noted.

(d) A seaman's Social Security number may be endorsed on his document only by the Officer in Charge, Marine Inspection, or the officer or person designated for the purpose of issuing documents, including Shipping Commissioners and Collectors of Customs acting as Shipping Commissioners.

(e) Whenever a certificate or document of any type issued to seamen is reported to an Officer in Charge, Marine Inspection, as having been stolen, lost, or destroyed, the Officer in Charge, Marine Inspection, shall immediately report the fact by letter to the Commandant, giving all the facts incident to its loss or destruction. By the same procedure, he shall report the recovery of any document together with all facts incident to its recovery, and shall forward the recovered document to the Commandant.

(f) An applicant for a certificate of service or of efficiency who has been duly examined and refused a certificate by an Officer in Charge, Marine Inspection, will not be permitted to make application for reexamination until 30 days have elapsed.

§ 12.02–19 Suspension or revocation of documents.

Any certificate of service or of efficiency or merchant mariner's document representing such certificate(s) is subject to suspension or revocation on the same grounds and in the same manner and with like procedure as is provided in the case of suspension or revocation of licenses of officers under the provisions of R.S. 4450, as amended (46 U.S.C. 239).

§ 12.02–21 Issuance of documents after revocation.

(a) An applicant who has had a certificate or other document revoked and who is applying for certification in the same or any other rating shall state in his application the date of revocation

and number or type of the document revoked.

(b) No applicant who has had a certificate or other document revoked will be certificated in the same or any other rating except upon approval of the Commandant.

§ 12.02–23 Issuance of duplicate documents.

(a) If a seaman loses his continuous discharge book, certificate of identification, or merchant mariner's document representing a certificate of identification, or certificate of discharge by shipwreck or other casualty, he shall be supplied with a reissue of such documents free of charge. The phrase "or other casualty" as used in this section is interpreted to mean any damage to a ship caused by collision, explosion, tornado, wreck or flooding of the ship, such as a tidal wave or a grounding of the ship on a sand bar, or a beaching of the ship on a shore or by fire or other causes in a category with these mentioned.

(b) If a seaman loses his continuous discharge book, or merchant mariner's document representing a certificate of identification, or certificate of discharge, otherwise than by shipwreck or other casualty, he will be required to pay for a reissue or a duplicate at an amount equal to the cost of such document or certificate to the Government as prescribed in 33 CFR 1.25–65.

(c) The seaman shall be required to pay for the reissue document (if payment is required) at the time of the issuance of such document to him and in the event the lost document is found he shall be required to surrender same to the Shipping Commissioner, Collector or Deputy Collector of Customs, or the Officer in Charge, Marine Inspection. If the seaman requests a certificate of identification in lieu of a lost book, or vice versa, he shall be required to pay for the reissue of the lost document at the time of its issuance (if payment is required). When the reissue of the document is issued to him, he may then exchange the same in accordance with the regular procedure.

(d) A seaman shall be required to furnish one properly executed application on Coast Guard Form CG–719–E, giving satisfactory evidence of the loss of his documents to the Officer in Charge, Marine Inspection, Shipping Commissioner, Collector of Customs, Deputy Collector of Customs, or other authorized person. The application shall be accompanied by one photograph for each reissue of document requested, except no photograph is required for a reissue certificate of discharge. The application and necessary photographs shall be forwarded by the official receiving them to Coast Guard Headquarters and the Commandant will cause to be prepared a duplicate of lost document requested. The duplicate document will be prepared from available records at Coast Guard Headquarters and returned for issuance to the office which forwarded the application. The reissued document will be marked "duplicate," and will bear the same number as the original book or certificate of identification with the addition of the suffix "D–1" on the first reissue, "D–2" on the second reissue, "D–3" on the third reissue, etc.; such suffix shall then become part of the serial number and shall be recorded in all subsequent records.

(e) Any person whose certificate of service or efficiency has been stolen, lost or destroyed, shall report that fact to an Officer in Charge, Marine Inspection, as soon as possible.

(f) No application from an alien for a duplicate of a certificate of service, certificate of efficiency, certificate of identification, continuous discharge book, or merchant mariner's document shall be accepted unless the alien complies with the requirements of § 12.02–10 with respect to proof that he is lawfully admitted to the United States for permanent residence.

(Sec. 5, 49 Stat. 1935, as amended, sec. 1, 52 Stat. 753, as amended, 55 Stat. 579; 46 U.S.C. 672a, 672b, 672–1, 672–2)

Subpart 12.05—Able Seamen

§ 12.05–1 Certification required.

(a) Every person employed in a rating as able seaman on any United States vessel requiring certificated able seamen, before signing articles of agreement, shall present to the Shipping Commissioner, United States Collector or Deputy Collector of Customs, or master, his certificate as able seaman or his merchant mariner's document endorsed as able seaman.

(b) No certificate as able seaman is required of any person employed on any unrigged vessel except seagoing barges, nor on any tug or towboat on the bays and sounds connected directly with the seas.

(c) No certificate as able seaman is required of any person employed on any sail vessel of less than 500 net tons while not carrying passengers for hire and while not operating outside the line dividing inland waters from the high seas.

§ 12.05–3 General requirements.

(a) To qualify for certification as able seaman an applicant shall be:

(1) At least 19 years of age;

(2) Pass the prescribed physical examination;

(3) Meet the sea service or training requirements set forth in this part;

(4) Satisfactorily pass an examination demonstrating his ability as an able seaman and lifeboatman; and

(5) Be able to speak and understand the English language as would be required in the rating of able seaman and in an emergency aboard ship.

§ 12.05–5 Physical requirements.

(a) All applicants for a certificate of service as able seaman shall be required to pass a physical examination given by a medical officer of the United States Public Health Service and present to the Officer in Charge, Marine Inspection, a certificate executed by the Public Health Service Officer. Such certificate shall attest to the applicant's acuity of vision, color sense, hearing, and general physical condition. In exceptional cases where an applicant would be put to great inconvenience or expense to appear before a medical officer of the United States Public Health Service, the physical examination and certification may be made by any other reputable physician.

(b) The medical examination for an able seaman is the same as for an original license as a deck officer as set forth in § 10.02–5 of this subchapter. If the applicant is in possession of an unexpired deck license, the Officer in Charge, Marine Inspection, may waive the requirement for a physical examination.

§ 12.05–7 Service or training requirements.

(a) The minimum service or training required to qualify an applicant for certification and the various endorsements as able seaman is listed in this paragraph:

(1) *High seas and inland waters*—(i) *"Any waters—unlimited."* Three years' service on deck in vessels of 100 gross tons or over operating on ocean or coastwise routes or on the Great Lakes.

(ii) *"Any waters—unlimited."* The period of time spent by an applicant successfully completing a course of able seaman's training in a training school approved by the Commandant may be accepted as the equivalent of sea service up to a maximum of 1 year of the 3 years required in subdivision (i) of this subparagraph.

(iii) *"Any waters—unlimited."* Satisfactory completion of 18 months' training in a seagoing training ship approved by the Commandant.

(iv) *"Any waters—12 months."* 12 months' service on deck in vessels of 100 gross tons or over operating on ocean or coastwise routes or on the Great Lakes. (Holders of certification under this provision are limited to one-fourth of the number of able seamen required by law to be employed on a vessel.)

(v) *"Any waters—12 months."* Satisfactory completion of a course of training at a U. S. Maritime Service Training Station of at least 9 months, 6 months of which shall have been served aboard a seagoing training vessel. (Holders of certification under this provision are limited to one-fourth of the number of able seamen required by law to be employed on a vessel.)

(2) *Great Lakes and inland waters*—(i) *"Great Lakes—18 months' service."* 18 months' service on deck in vessels of 100 gross tons or over operating on ocean or coastwise routes, or on the Great Lakes, smaller lakes, bays, or sounds. (Holders of certification under this provision may comprise the required number of able seamen on vessels on the Great Lakes and on the smaller lakes, bays, and sounds.) If the seaman possesses the requisite service for certification under subparagraph (1)(iv) of this paragraph, there shall be added "any waters—12 months."

(3) *Tugs and towboats*—(i) *"Tugs and towboats—any waters."* 18 months' service on deck in vessels operating on ocean or coastwise routes, or on the Great Lakes, or on the bays and sounds connected directly with the seas.

(4) *Bays and sounds*—(i) *"Bays and sounds—12 months, vessels 500 gross*

tons or under not carrying passengers." 12 months' service on deck in vessels operating on ocean or coastwise routes, or on the Great Lakes, or on the bays and sounds connected directly with the seas.

(5) *Barges*—(i) *"Seagoing barges—12 months."* 12 months' service on deck in vessels operating on ocean or coastwise routes, or on the Great Lakes, or on the bays and sounds connected directly with the seas.

§ 12.05–9 Examination and demonstration of ability.

(a) Before an applicant is certified as able seaman, he shall prove to the satisfaction of the Coast Guard by oral or written examination and by actual demonstration, his knowledge of seamanship and his ability to carry out effectively all the duties that may be required of an able seaman, including those of a lifeboatman. He shall demonstrate that:

(1) He has been trained in all the operations connected with the launching of lifeboats and liferafts and the use of oars and sail;

(2) He is acquainted with the practical handling of the boats themselves; and

(3) He is capable of taking command of a boat's crew.

(b) The oral or written examination shall be conducted only in the English language and shall consist of questions regarding:

(1) Lifeboats and liferafts, the names of their essential parts, and a description of the required equipment;

(2) The clearing away, swinging out, and lowering of lifeboats and liferafts, the handling of lifeboats under oars and sails, including questions relative to the proper handling of a boat in a heavy sea;

(3) The operation and functions of commonly used types of davits;

(4) The applicant's knowledge of nautical terms; boxing the compass, either by degrees or points according to his experience; running lights, passing signals, and fog signals for vessels on the high seas, in inland waters, or on the Great Lakes depending upon the waters on which the applicant has had service; and distress signals; and,

(5) The applicant's knowledge of commands in handling the wheel by obeying orders passed to him as "wheelsman," and knowledge of the use of engineroom telegraph or bell-pull signals.

(c) In the actual demonstration, the applicant shall show his ability by taking command of a boat and directing the operation of clearing away, swinging out, lowering the boat into the water, and acting as coxswain in charge of the boat under oars. He shall demonstrate his ability to row by actually pulling an oar in the boat. He shall also demonstrate knowledge of the principal knots, bends, splices, and hitches in common use by actually making them.

(d) Any person who is in valid possession of a certificate as able seaman endorsed, "any waters—12 months" and who can produce documentary evidence of sufficient service to qualify for a certificate as able seaman endorsed, "any waters—unlimited," may be issued a new document bearing this endorsement without additional professional examination. The applicant shall surrender for cancellation the document bearing the limited endorsement. No physical examination will be required at the time of this exchange unless it is found that the applicant obviously suffers from some physical or mental infirmity to a degree that in the opinion of the Officer in Charge, Marine Inspection, would render him incompetent to perform the usual duties of an able seaman at sea. If such condition is believed to exist, the applicant shall be required to undergo an examination by a medical officer of the Public Health Service to determine his competency.

§ 12.05–11 General provisions respecting merchant mariner's documents endorsed as able seaman.

(a) The holder of a merchant mariner's document endorsed for the rating of able seaman may serve in any unlicensed rating in the deck department without obtaining an additional endorsement.

(b) A merchant mariner's document endorsed as able seaman will also be considered a certificate of efficiency as lifeboatman without further endorsement.

(c) This type of document will describe clearly the type of able seaman certificate which it represents, e. g.: able seaman—any waters; able seaman—any waters, 12 months; able seaman—Great Lakes, 18 months; able seaman—on freight vessels 500 gross tons or less on bays or sounds, and on tugs, towboats, and barges on any waters.

Subpart 12.10—Lifeboatman

§ 12.10–1 Certification required.

Every person employed in a rating as lifeboatman on any United States vessel requiring certificated lifeboatmen shall produce a certificate as lifeboatman or merchant mariner's document endorsed as lifeboatman or able seaman to the shipping commissioner, United States collector or deputy collector of customs, or master before signing articles of agreement. No certificate of efficiency as lifeboatman is required of any person employed on any unrigged vessel, except on a seagoing barge and on a tank barge navigating waters other than rivers and/or canals.

§ 12.10–3 Service or training requirements.

(a) An applicant to be eligible for certification as lifeboatman must meet one of the following requirements:

(1) At least 1 year's sea service in the deck department, or at least 2 years' sea service in the other departments of ocean, coastwise, Great Lakes, and other lakes, bays, or sounds vessels.

(2) Graduation from a schoolship approved by and conducted under rules prescribed by the Commandant.

(3) Satisfactory completion of basic training by a Cadet of the United States Merchant Marine Cadet Corps.

(4) Satisfactory completion of 3 years' training at the U. S. Naval Academy or the U. S. Coast Guard Academy including two training cruises.

(5) Satisfactory completion of a course of training approved by the Commandant, and served aboard a training vessel.

(6) Successful completion of a training course approved by the Commandant, such course to include a minimum of 30 hours' actual lifeboat training: *Provided*, That the applicant produces evidence of having served a minimum of 3 months at sea aboard ocean or coastwise vessels.

(b) An applicant, to be eligible for certification as lifeboatman, shall be able to speak and understand the English language as would be required in the rating of lifeboatman and in an emergency aboard ship.

§ 12.10–5 Examination and demonstration of ability.

(a) Before a lifeboatman's certificate may be granted, the applicant must prove to the satisfaction of the Coast Guard by oral or written examination and by actual demonstration that:

(1) He has been trained in all the operations connected with the launching of lifeboats and liferafts and the use of oars and sails;

(2) He is acquainted with the practical handling of boats themselves; and,

(3) He is capable of taking command of a boat's crew.

(b) The oral or written examination shall be conducted only in the English language and shall consist of questions regarding:

(1) Lifeboats and liferafts, the names of their essential parts, and a description of the required equipment;

(2) The clearing away, swinging out, and lowering of lifeboats and liferafts, the handling of lifeboats under oars and sails, including questions relative to the proper handling of a boat in a heavy sea; and,

(3) The operation and functions of commonly used types of davits.

(c) The practical examination shall consist of a demonstration of the applicant's ability to carry out the orders incident to launching lifeboats, and the use of the boat's sail, and to row.

(Sec. 1, 52 Stat. 753, as amended, 55 Stat. 579; 46 U. S. C. 672b, 672–1, 672–2)

§ 12.10–7 General provisions respecting merchant mariner's documents endorsed as lifeboatman.

A merchant mariner's document endorsed as able seaman shall be considered as the equivalent of a certificate as lifeboatman or an endorsement as lifeboatman and it shall be accepted as a certificate as lifeboatman wherever required by law or regulation.

Subpart 12.15—Qualified Member of the Engine Department

§ 12.15–1 Certification required.

(a) Every person employed in a rating as qualified member of the engine department on any United States vessel requiring certificated qualified members of the engine department shall produce a certificate as qualified member of the engine department to the shipping commissioner, United States Collector or Deputy

Collector of Customs, or master before signing articles of agreement.

(b) No certificate as qualified member of the engine department is required of any person employed on any unrigged vessel, except seagoing barges.

§ 12.15–3 General requirements.

(a) A qualified member of the engine department is any person below the rating of licensed officer and above the rating of coal passer or wiper, who holds a certificate of service as such qualified member of the engine department issued by the Coast Guard or predecessor authority.

(b) For purposes of administering this part the rating of "assistant electrician" is considered a rating not above that of coal passer or wiper, but equal thereto.

(c) An applicant, to be eligible for certification as qualified member of the engine department, shall be able to speak and understand the English language as would be required in the rating of qualified member of the engine department and in an emergency aboard ship.

§ 12.15–5 Physical requirements.

(a) An applicant for a certificate of service as a qualified member of the engine department shall present a certificate of a medical officer of the United States Public Health Service, or other reputable physician attesting that his eyesight, hearing, and physical condition are such that he can perform the duties required of a qualified member of the engine department.

(b) The medical examination for qualified member of the engine department is the same as for an original license as engineer, as set forth in § 10.02–5 of this subchapter. If the applicant is in possession of an unexpired license, the Officer in Charge, Marine Inspection, may waive the requirement for a physical examination.

(c) An applicant holding a certificate of service for a particular rating as qualified member of the engine department and desiring certification for another rating covered by this same form of certificate may qualify therefor without a physical examination unless the Officer in Charge, Marine Inspection, finds that the applicant obviously suffers from some physical or mental infirmity to a degree that would render him incompetent to perform the ordinary duties of a qualified member of the engine department. In this event the applicant shall be required to undergo an examination to determine his competency.

§ 12.15–7 Service or training requirements.

(a) An applicant for a certificate of service as qualified member of the engine department shall furnish the Coast Guard proof that he possesses one of the following requirements of training or service:

(1) Six months' service at sea in a rating at least equal to that of coal passer or wiper in the engine department of vessels required to have such certificated men, or in the engine department of tugs or towboats operating on the high seas or Great Lakes, or on the bays or sounds directly connected with the seas; or,

(2) Graduation from a schoolship approved by and conducted under rules prescribed by the Commandant; or,

(3) Satisfactory completion of a course of training approved by the Commandant, and served aboard a training vessel; or,

(4) Graduation from the U. S. Naval Academy or the U. S. Coast Guard Academy.

§ 12.15–9 Examination requirements.

(a) Applicants for certification as qualified members of the engine department in the ratings of oiler, watertender, fireman, deck engineer, refrigerator engineer, junior engineer, electrician, and machinist shall be examined orally or in writing and only in the English language on the subjects listed in paragraph (b) of this section. The applicant's general knowledge of the subjects must be sufficient to satisfy the examiner that he is qualified to perform the duties of the rating for which he makes application.

(b) List of subjects required:

TABLE 12.15-9 (b)—SUBJECTS FOR QUALIFIED MEMBERS OF ENGINE DEPARTMENT

Subjects	Machinist	Refrigerating engineer	Fireman	Watertender	Oiler	Electrician	Junior engineer	Deck engineer
1. Application, maintenance, and use of hand tools and measuring instruments	X	X	X	X	X	X	X	X
2. Uses of babbitt, copper, brass, steel, and other metals	X	X		X	X	X	X	X
3. Methods of measuring pipe, pipe fittings, sheet metal, machine bolts and nuts, packing, etc	X	X		X	X	X	X	X
4. Operation and maintenance of mechanical remote control equipment	X			X	X	X	X	X
5. Precautions to be taken for the prevention of fire and the proper use of firefighting equipment	X	X	X	X	X	X	X	X
6. Principles of mechanical refrigeration; and functions, operation, and maintenance of various machines and parts of the systems		X			X		X	
7. Knowledge of piping systems as used in ammonia, freon, and CO_2, including testing for leaks, operation of bypasses, and making up of joints		X					X	
8. Safety precautions to be observed in the operation of various refrigerating systems, including storage of refrigerants, and the use of gas masks and firefighting equipment	X	X		X	X	X	X	X
9. Combustion of fuels, proper temperature, pressures, and atomization			X	X	X		X	
10. Operation of the fuel oil system on oil burning boilers, including the transfer and storage of fuel oil			X	X	X		X	X
11. Hazards involved and the precautions taken against accumulation of oil in furnaces, bilges, floorplates, and tank tops; flarebacks, leaks in fuel oil heaters, clogged strainers and burner tips	X	X	X	X	X	X	X	
12. Precautions necessary when filling empty boilers, starting up the fuel oil burning system, and raising steam from a cold boiler			X	X	X		X	
13. The function, operation, and maintenance of the various engineroom auxiliaries	X	X		X	X	X	X	
14. Proper operation of the various types of lubricating systems	X	X		X	X	X	X	X
15. Safety precautions to be observed in connection with the operation of engineroom auxiliaries, electrical machinery, and switchboard equipment	X	X		X	X	X	X	X
16. The function, operation, and maintenance of the bilge, ballast, fire, freshwater, sanitary, and lubricating systems	X	X		X	X		X	X
17. Proper care of spare machine parts and idle equipment	X	X		X	X	X	X	X
18. The procedure in preparing a turbine, reciprocating, or Diesel engine for standby; also the procedure in securing				X	X		X	
19. Operation and maintenance of the equipment necessary for the supply of water to boilers, the dangers of high and low water and remedial action			X	X	X		X	
20. Operation, location, and maintenance of the various boiler fittings and accessories	X		X	X	X		X	
21. The practical application and solution of basic electrical calculations, (Ohm's law, power formula, etc.)						X	X	X
22. Electrical wiring circuits of the various two-wire and three-wire D. C. systems and the various single-phase and polyphase A. C. systems						X	X	X
23. Application and characteristics of parallel and series circuits						X	X	X
24. Application and maintenance of electrical meters and instruments						X	X	X
25. The maintenance and installation of lighting and power wiring involving testing for, locating and correcting grounds, short circuits and open circuits, and making splices						X	X	X
26. The operation and maintenance of the various types of generators and motors, both A. C. and D. C.						X	X	X
27. Operation, installation, and maintenance of the various types of electrical controls and safety devices						X	X	X
28. Testing and maintenance of special electrical equipment such as telegraphs, telephones, alarm systems, fire-detecting systems, and rudder angle indicators						X	X	
29. Rules and Regulations and requirements for installation, repair, and maintenance of electrical wiring and equipment installed aboard ships						X	X	X
30. Such further examination of a nonmathematical character as the Officer in Charge, Marine Inspection, may consider necessary to establish the applicant's proficiency	X	X	X	X	X	X	X	X

(c) Applicants for certification as qualified member of the engine department in ratings other than those indicated in table 12.15-9 (b) shall, by written or oral examination, demonstrate sufficient general knowledge of the subjects peculiar to the rating applied for to satisfy the Officer in Charge, Marine Inspection, that they are qualified to perform the duties of the rating.

§ 12.15-11 General provisions respecting merchant mariner's documents endorsed as qualified member of the engine department.

The holder of a merchant mariner's document endorsed with one or more qualified member of the engine department ratings may serve in any unqualified rating in the engine department without obtaining an additional endorsement. This does not mean that an endorsement of one qualified member of the engine department rating authorizes the holder to serve in all qualified member of the engine department ratings. Each qualified member of the engine department rating for which a holder of a merchant mariner's document is qualified must be endorsed separately. When, however, the applicant qualifies for all ratings covered by a certificate as a qualified member of the engine department, the certification may read "QMED—any rating." The ratings are as follows:

(a) Refrigerating engineer.
(b) Oiler.
(c) Watertender.
(d) Fireman.
(e) Deck engineer.
(f) Junior engineer.
(g) Electrician.
(h) Boilermaker.
(i) Machinist.
(j) Pumpman.

Subpart 12.20—Tankerman

§ 12.20-1 General requirements.

(a) Any applicant for a certificate as tankerman who is not licensed as master, mate, pilot or engineer, shall be eligible for certification after he has furnished satisfactory documentary evidence to the Coast Guard that he is trained in, and capable of performing efficiently the necessary operations on tank vessels which relate to the handling of cargo.

(b) Applicants qualifying for certification as tankerman shall be issued a merchant mariner's document endorsed with the rating of tankerman and the kinds or grades of liquid cargo the holder is qualified to handle.

(c) A currently valid license as master, mate, pilot or engineer shall be considered as a certificate as tankerman and the holder may serve as tankerman upon inspected vessels of the United States required to have such certificated tankerman without having a separate certificate as tankerman.

(d) An applicant, to be eligible for certification as tankerman, shall be able to speak and understand the English language as would be required in the rating of tankerman and in an emergency aboard ship.

§ 12.20-3 Physical requirements.

(a) Applicant for certification as tankerman shall present a certificate of a medical officer of the United States Public Health Service, or other reputable physician, attesting that his eyesight, hearing, and physical condition are such that he can perform the duties required of a tankerman.

(b) The medical examination is the same as for an original license as engineer, except that the applicant will be given a color vision test required for a licensed deck officer as set forth in § 10.02-5 of this subchapter.

§ 12.20-5 Examination requirements.

Any applicant for certification as tankerman must prove to the satisfaction of the Coast Guard by an oral or written examination conducted only in the English language that he is familiar with the general arrangement of cargo tanks, suction and discharge pipelines and valves, cargo pumps and cargo hose, and has been properly trained in the actual operation of cargo pumps, all other operations connected with the loading and discharging of cargo, and the use of fire-extinguishing equipment.

Subpart 12.25—Certificates of Service for Ratings Other Than Able Seaman or Qualified Member of the Engine Department

§ 12.25-1 Certification required.

(a) Every person employed in a rating other than able seaman or qualified member of the engine department of United States merchant vessels requiring such certificated persons shall produce an appropriate certificate of service or merchant mariner's document to the shipping commissioner, United States Collector or Deputy Collector of Customs, or master, before signing articles of agreement.

(b) No certificate of service shall be required of any person employed on any unrigged vessel, except seagoing barges, or on any sail vessel of less than 500 net tons while not carrying passengers for hire and while not operating outside the line dividing inland waters from the high seas, as defined in section 2 of the act of February 19, 1895, as amended (33 U.S.C. 151) and in 33 CFR Part 82.

§ 12.25-5 Commitment of employment.

(a) An applicant for an original merchant mariner's document endorsed for service in ratings for which no professional examination is required shall produce satisfactory proof that he has a commitment of employment as a member of the crew of a United States merchant vessel.

(b) A transcript of sea service in the U.S. Navy, U.S. Coast Guard, U.S. Military Sea Transportation Service, or U.S. Army Transportation Corps shall be accepted in lieu of a letter of commitment.

§ 12.25-10 General requirements.

(a) Merchant mariner's documents shall be issued without professional examination to applicants for certificates of service as endorsements on merchant mariner's documents in capacities other than able seaman, lifeboatman, tankerman or qualified member of the engine department and shall be endorsed for one or more ratings. For example, "ordinary seaman"—"wiper"—"steward's document (F.H.)." Holders of documents endorsed for service as "ordinary seaman" may serve in any unqualified rating in the deck department. Holders of documents endorsed for service as "wiper" may serve in any unqualified rating in the engine department. Documents endorsed for "steward's department (F.H.)" will authorize the holder's service in any capacity in the steward's department. (See § 12.02-11(e)(2) for unqualified ratings in the staff department.)

(b) When the holder of a merchant mariner's document has qualified as a food handler, the endorsement of his rating will be followed by the further indorsement "(F.H.)."

§ 12.25-20 Food handler.

No applicant for a rating authorizing the handling of food will be certificated unless he produces a certificate from a medical officer of the United States Public Health Service, or other reputable physician stating that the applicant is free from communicable disease.

§ 12.25-25 Members of Merchant Marine Cadet Corps.

No ratings other than cadet (deck) or cadet (engine) as appropriate, and lifeboatman shall be shown on a merchant mariner's document issued to a member of the U.S. Merchant Marine Cadet Corps. The merchant mariner's document shall also be stamped "Valid only while cadet in the U.S. Maritime Administration training program." The merchant mariner's document thus prepared shall be surrendered upon the holder being certified in any other rating or being issued a license and the rating of cadet (deck) or cadet (engine) shall be omitted from any new merchant mariner's document issued.

(Sec. 1, 52 Stat. 753, as amended, 55 Stat. 579; 46 U.S.C. 672b, 672-1, 672-2)

§ 12.25-30 Student observers.

Students in technical schools who are enrolled in courses in marine management and ship operations who present a letter or other documentary evidence that they are so enrolled shall be issued a merchant mariner's document as "student observers—any department" and may be signed on ships as such. Students holding these documents or certificates will not take the place of any of the crew, or fill any of the regular ratings.

PART 14—SHIPMENT AND DISCHARGE OF SEAMEN

Subpart 14.01—General

Sec.
14.01-1 Employment of seamen whose citizenship has not been established.
14.01-10 Reporting loss or recovery of continuous discharge book, certificate of identification, or certificate of discharge.

Subpart 14.05—Shipping Articles

Sec.
14.05-1 Preparation and number of copies of shipping articles.
14.05-3 Certification of shipping articles.
14.05-5 Paying off seamen during voyage.
14.05-10 Completing entries in shipping articles at completion of voyage.
14.05-15 Production of documents by seamen signing shipping articles.
14.05-20 Master reporting shipping and discharging of seamen on Form CG-735-T.

Subpart 14.10—Discharging Seamen

14.10-1 Entries in Continuous Discharge Book.
14.10-5 Entries in Certificate of Discharge to Merchant Seamen.
14.10-10 Discharging a seaman in a foreign port.
14.10-15 Certificate of discharge issued pending issuance of duplicate continuous discharge book.
14.10-20 Discharge of seamen in special cases.

AUTHORITY: The provisions of this Part 14 are issued under R.S. 4551, as amended, sec. 13, 38 Stat. 1169, as amended, sec. 7, 49 Stat. 1936, as amended; 46 U.S.C. 643, 672, 689, Treasury Department Order 120, July 31, 1950, 15 F.R. 6521, unless otherwise noted.

Subpart 14.01—General

§ 14.01-1 Employment of seamen whose citizenship has not been established.

Seamen whose continuous discharge books, certificates of identification or merchant mariner's documents show question marks with reference to place of birth and/or citizenship shall not be considered as citizens of the United States in computing the number of citizens required by statute to be employed in the crew of a vessel.

§ 14.01-10 Reporting loss or recovery of continuous discharge book, certificate of identification, or certificate of discharge.

Wherever a continuous discharge book, certificate of identification, or certificate of discharge is reported to a shipping commissioner, Collector of Customs, or an Officer in Charge, Marine Inspection, as having been stolen, lost, or destroyed, the shipping commissioner, collector of customs, or Officer in Charge, Marine Inspection, shall immediately report the fact by letter to the Commandant, giving all the facts incident to its loss or destruction. By the same procedure, he shall report the recovery of a continuous discharge book, certificate of identification, or certificate of discharge with all the facts incident to its recovery, and shall forward the recovered book, certificate of identification, or certificate of discharge to the Commandant.

Subpart 14.05—Shipping Articles

§ 14.05-1 Preparation and number of copies of shipping articles.

Shipping articles shall be made out in quadruplicate by carbon process. When the signing on of the crew has been completed the triplicate and quadruplicate copies shall be removed from the pad by the shipping commissioner, who will retain the triplicate copy and forward the quadruplicate copy to Commandant (MVP), Coast Guard Headquarters, Washington, D.C., 20226, "Attention Merchant Vessel Personnel Records and Welfare Section." The original and duplicate copies of the articles remaining in the pad shall be given to the master who shall enter therein any changes made in the crew during the voyage.

§ 14.05-3 Certification of shipping articles.

For every vessel bound on any foreign voyage required to have shipping articles, it shall be the duty of the owners of such vessel to obtain from the shipping commissioner or the person performing duties of a shipping commissioner a statement showing that the duplicate copy of the shipping articles is a true and certified copy as required by R. S. 4575, as amended (46 U. S. C. 676).

(Interprets or applies R. S. 4575, as amended; 46 U.S.C. 676)

§ 14.05-5 Paying off seamen during voyage.

In case of the paying off of any members of the crew during the voyage, they shall be required to sign the mutual release on both the original and the duplicate of the articles whether discharged before a shipping commissioner in an American port or before an American consul in a foreign port.

§ 14.05-10 Completing entries in shipping articles at completion of voyage.

(a) At the completion of the voyage, when the crew is paid off, the mutual release on both the original and the duplicate of the articles must be signed by all members of the crew; and the original copy, together with the white copy of every certificate of discharge, Form CG-718A rev., given during the voyage or a record of entry, Form CG-718E, of every entry made in a continuous discharge book during the voyage, shall be forwarded to the Commandant (MVP), Coast Guard Headquarters, Washington, D.C., 20226. The duplicate copy shall be retained by the shipping commissioner.

(b) All columns on the shipping articles shall be properly filled in and the certifications on the back properly signed.

(c) All entries made in the continuous discharge books during the voyage, and the entries made in all certificates of discharge issued during the voyage to seamen holding certificates of identification shall be shown on the ship's articles.

§ 14.05-15 Production of documents by seamen signing shipping articles.

Every seaman shall be required, when signing articles, to produce his continuous discharge book or certificate of identification, as well as his license, certificate of registry, or certificate of service, in order that the serial numbers may be entered on the articles.

§ 14.05-20 Master reporting shipping and discharging of seamen on Form CG-735-T.

(a) The master of every merchant vessel of the United States of the burden of one hundred gross tons or upward, except vessels employed exclusively in trade on the navigable rivers of the United States, fishing and whaling vessels, yachts, ferries and tugs used in ferry operations if such ferries and tugs are employed exclusively in trade on the Great Lakes, lakes (other than the Great Lakes), bays, sounds, bayous, canals, and harbors, and are not engaged on international voyages, and unrigged vessels other than seagoing barges, shall report the employment, discharge, or termination of the services of every seaman not shipped or discharged before a shipping commissioner, or a Collector or Deputy Collector of Customs acting as shipping commissioner on Coast Guard Form CG-735-T in the manner provided in this section.

(b) When a vessel is sailing on a voyage which will extend to the ocean or to the Gulf of Mexico and when coastwise Shipping Articles are opened or when the vessel is departing on a coastwise voyage for which Shipping Articles are not required the master shall, immediately prior to sailing, submit to the Officer in Charge, Marine Inspection, a Form CG-735-T listing the names, as well as the other data required by the form with the exception of the date and place of discharge, of the master and of each member of the crew. Thereafter, at each domestic port visited on the voyage, the master shall, prior to departure, submit to the Officer in Charge, Marine Inspection, a supplementary report on Form CG-735-T listing the name, as well as the other data required by the form, of each seaman engaged or discharged or whose services were otherwise terminated since the previous submission of the form. When coastwise Shipping Articles are completed or when a voyage on which Shipping Articles are not required is completed, the master shall submit to the Officer in Charge, Marine Inspection, a Form CG-735-T listing the names, as well as the other data required by the form, of the master and of each member of the crew on board at the time of the completion of the voyage.

(c) When a vessel is employed exclusively in trade on bays or sounds, the master shall submit a Form CG-735-T, on the last day of each calendar month, listing the name, as well as the other data required by the form—including the dates and places of engagement and discharge, of each seaman employed, discharged, or whose services were otherwise terminated during the calendar month. This form shall be forwarded by the master directly to Commandant (MVP), Coast Guard Headquarters, Washington, D.C., 20226.

(d) When a vessel is employed exclusively in trade on the Great Lakes, the master shall submit Form CG-735-T at the commencement of the season, or when the vessel is put into service, listing the names, as well as other information required by the form, with the exception of date and place of discharge, of each member of the crew. Thereafter, at the end of each calendar month, the master shall submit a supplementary report on Form CG-735-T listing the names, as

well as other information required by the form, of (1) each seaman whose employment was terminated during the month and who was not reengaged on the vessel's next trip, and (2) each seaman engaged during the month who was not also employed on the vessel in the same capacity on her last trip preceding the engagement. At the close of the season, or when the vessel is withdrawn from service, the master shall submit a final report on Form CG–735–T listing the names, as well as other information required by the form, of each seaman who has not been previously reported as discharged.

(e) Every discharge entry made on a Form CG–735–T shall agree exactly with the corresponding entry made in a continuous discharge book or on the certificate of discharge issued to a seaman and a record of entry (Form CG–718–E) or a white copy of a certificate of discharge (Form CG–718–A, Revised) supporting each discharge shall be attached to any Form CG–735–T on which discharges are reported.

(f) Any master who fails to comply with the requirements of this section is subject to a penalty of $500.

Subpart 14.10—Discharging Seamen

§ 14.10–1 Entries in Continuous Discharge Book.

(a) Upon the discharge of any seaman and payment of his wages, the shipping commissioner or Collector or Deputy Collector of Customs at ports where no shipping commissioner has been appointed, shall enter in the Continuous Discharge Book (Form CG–719) of such seaman, if the seaman carries such a book, the name and official number of the vessel together with the name of the employer, the nature of the voyage (foreign, intercoastal, or coastwise (including Great Lakes)), the class to which the vessel belongs (steam, motor, sail, or barge), the date and place of the shipment and of the discharge of such seaman, the rating (capacity in which employed) then held by such seaman, and the signature of the person making such entries and nothing more.

(b) In cases where the law does not require the seaman to be shipped and discharged before a shipping commissioner, the master of the vessel shall make the required entries in the Continuous Discharge Book.

(c) The person making the required entries in the Continuous Discharge Book shall also prepare a "Record of Entry in Continuous Discharge Book" (Form CG–718E). The required entries include those described in paragraph (a) of this section, the full name and citizenship of the seaman, and the serial number of his Continuous Discharge Book.

(d) The completed Form CG–718E shall be signed by the seaman in whose Continuous Discharge Book the original entry was made and by the person making the entry in the Continuous Discharge Book. In cases where the record of entry is signed by a shipping commissioner, or a Collector or Deputy Collector of Customs, the master is not required to sign the record of entry, but his name must be shown on the completed Form CG–718E.

(e) All entries in the Continuous Discharge Book (Form CG–719) shall be made in black ink. All entries on the completed Form CG–718E shall be made with a typewriter or an indelible pencil to insure legible copies.

(f) The original copy of completed Form CG–718E shall be for the Commandant's records. The duplicate copy of completed Form CG–718E will be retained by the shipping commissioner, Collector or Deputy Collector of Customs, or master issuing such record of entry. (See §§ 14.05–10 and 14.05–20 for instructions governing submission to the Commandant.)

§ 14.10–5 Entries in Certificate of Discharge to Merchant Seaman.

(a) Upon the discharge of any seaman who holds a merchant mariner's document or a certificate of identification issued by the Coast Guard or predecessor authority, and payment of his wages, the shipping commissioner, or the Collector or Deputy Collector of Customs at ports where no shipping commissioner has been appointed, shall issue to the seaman a "Certificate of Discharge to Merchant Seaman" (Form CG–718A) and shall complete the required entries on this certificate showing the full name and citizenship of the seaman to whom it is issued, the serial number of his merchant mariner's document or certificate of identification, the name and official number of the vessel together with the name of the employer, the nature of the voyage (foreign, intercoastal, or coastwise (including Great Lakes)), the class to which the vessel belongs (steam, motor, sail, or barge), the date and place of the shipment and of the discharge of such seaman, and the rating (capacity in which employed) then held by such seaman.

(b) In cases where the law does not require the seaman to be shipped and discharged before a shipping commissioner, the master of the vessel shall issue the Certificate of Discharge to Merchant Seaman (Form CG–718A) and shall complete the required entries therein.

(c) The completed Form CG–718A shall be signed by the seaman to whom it is issued and by the master of the vessel. When the seaman is required to be discharged before a shipping commissioner, or a Collector or Deputy Collector of Customs at ports where no shipping commissioner has been appointed, the shipping Commissioner or Collector or Deputy Collector of Customs shall witness the signatures of the seaman and the master. The signatures shall be made with an indelible pencil and before the issuance of the original copy to the seaman.

(d) All entries on Certificates of Discharge to Merchant Seaman (Form CG–718A) shall be made with a typewriter or with an indelible pencil to insure legible copies.

(e) The original completed Form CG–718A shall be issued to the seaman who signs the certificate. The duplicate copy of the completed Form CG–718A will be retained by the shipping commissioner, Collector or Deputy Collector of Customs, or the master issuing such discharge. The white copy of completed Form CG–718A shall be for the Commandant's records. (See §§ 14.05–10 and 14.05–20 for instructions governing submission to the Commandant.)

§ 14.10–10 Discharging a seaman in a foreign port.

(a) Upon the discharge of any seaman in a foreign port the master shall make the proper entries in the continuous discharge book and on the ship's articles, and such entries shall be attested to by the consular officer, and Form CG–718E shall be completed in accordance with § 14.10–1. If the seaman possesses a certificate of identification, the master of the vessel shall issue to the seaman a certificate of discharge on Form CG–718A rev., and make the required entries therein which shall be attested by the consular officer. If the seaman has lost his continuous discharge book or certificate of identification, the master shall furnish him with a certificate of discharge (Form CG–718A rev.), attested to by the consular officer and note this fact on the articles.

(b) The white copy of any discharge Form CG–718A rev., given out in this manner or the original of the record of entry, Form CG–718E, shall be retained by the master until the articles covering that voyage are closed, at which time, if the crew is discharged before a shipping commissioner, or before a Collector or Deputy Collector of Customs at ports where no shipping commissioner has been appointed, it shall be delivered to that officer and forwarded by him to the Commandant, as prescribed in §§ 14.05–10 and 14.05–20; if the crew is not discharged before such officer, it shall be forwarded to the Commandant by the master as prescribed in §§ 14.05–10 and 14.05–20.

§ 14.10–15 Certificate of discharge issued pending issuance of duplicate continuous discharge book.

Pending the issuance of a duplicate of the continuous discharge book, the shipping commissioner, or Collector or Deputy Collector of Customs at ports where no shipping commissioner has been appointed, may furnish the seaman with a certificate of discharge (Form CG–718A rev.), at the completion of the voyage, and this fact shall be noted on the articles. The white copy of such discharge shall be forwarded to the Commandant, as prescribed in §§ 14.05–10 and 14.05–20.

§ 14.10–20 Discharge of seamen in special cases.

(a) Section 16 of the act of December 21, 1898 (30 Stat. 759), amended in part R. S. 4581 (46 U.S.C. 683), relating to the discharge of seamen by consuls, to read:

If a seaman is discharged on account of injury or illness, incapacitating him for service, the expenses of his maintenance and return to the United States shall be paid from the fund for the maintenance and transportation of destitute American seamen.

(b) Section 19 of the Seamen's Act of March 4, 1915 (38 Stat. 1185; 46 U. S. C. 683), adds to these words the following:

Provided, That at the discretion of the Commandant of the Coast Guard and under such regulations as he may prescribe, if any seaman incapacitated from service by injury or illness is on board a vessel so situated that a prompt discharge requiring the personal appearance of the master of the vessel before an American consul or consular agent is impracticable, such seaman may be sent to a consul or consular agent, who shall care for him and defray the cost of his maintenance and transportation, as provided in this paragraph.

(c) The personal appearance of the master of the vessel before an American consul or consular agent to consent to the discharge of a seaman who has been incapacitated by injury or illness may be waived by the consul under the following conditions:

(1) When the condition of the injured or ill seaman is such that prompt medical attendance is necessary and cannot be furnished on shipboard, and

(2) When the master cannot proceed with the seaman to the consul without risk to the crew, the vessel, or the cargo.

(d) When the master cannot appear before the consul in person he will address to the consul in writing a full statement of the facts which render necessary the discharge of the seaman, together with a statement of the reasons why he himself is unable to appear before the consul. The statement should cover the usual particulars set forth in a discharge and should be accompanied with an account of the wages due and with the necessary funds to meet such wages, or (if the cash be not available) with an order on the owner for the amount due.

(e) If the consul shall deem the statement satisfactory, he may discharge the seaman as directed in R. S. 4581, as amended by section 16 of the act of December 21, 1898, and section 19 of the act of March 4, 1915, as if the master were present, attaching to the discharge and to his relief account a copy of the statement submitted by the master.

(f) If the consul shall deem the statement unsatisfactory, he will decline to grant the discharge and direct that the seaman be returned to the vessel at its expense.

PART 15—ALLOTMENTS OF SEAMEN

Subpart 15.01—General

Sec.
15.01–1 Persons by and to whom allotments may be made.
15.01–5 Seaman may make more than one allotment.

Subpart 15.05—Procedures Covering Allotments

15.05–1 Allotments to be in writing.
15.05–5 Execution of allotments.
15.05–10 Effective date of allotment.
15.05–15 Cancellation of allotment.

Subpart 15.10—Computing Allotments

15.10–1 Wages upon which allotments may be based.
15.10–5 Limitation on amount of allotment.

Subpart 15.15—Payment and Accounting Required

Sec.
15.15–1 Time of payment of allotments.
15.15–5 Payment of allotments.
15.15–10 Accounting for payment.

AUTHORITY: The provisions of this Part 15 issued under 23 Stat. 55, as amended; 46 U.S.C. 599. Treasury Department Order 120, July 31, 1950, 15 F.R. 6521.

Subpart 15.01—General

§ 15.01–1 Persons by and to whom allotments may be made.

(a) Any seaman employed on any vessel (except seamen employed on fishing or whaling vessels or yachts), may stipulate in his shipping agreement for an allotment of a portion of the wages for which he is signed on (see § 15.10–5) to his grandparents, parents, wife, sister, or children; to an agency duly designated by the Secretary of the Treasury for the handling of applications for United States Savings Bonds, for the purpose of purchasing such bonds for the seaman; or for deposits to be made in an account for savings or investment opened by him and maintained in his name, either at a savings bank or a United States Postal Savings Depository, or a savings institution in which such accounts are insured by the Federal Deposit Insurance Corporation or the Federal Savings and Loan Insurance Corporation.

(b) Allotments for the purchase of United States Savings Bonds shall be in an amount corresponding exactly to the issue price of such bonds. The bank or other issuing agency will forward the bonds by mail to the address designated by the seaman, but only within the United States, its territories and insular possessions and the Canal Zone.

(c) The term "savings bank" includes any bank, savings bank, or trust company wherein a savings department is maintained; or any Federal Credit Union organized in accordance with the provisions of the Federal Credit Union Act (48 Stat. 1216, 12 U. S. C. 1751–1771); or any credit union organized under substantially similar laws of any State or the District of Columbia, which is approved by the Commandant of the Coast Guard.

(d) No allotments may be drawn in favor of a joint tenant in a savings account unless such joint tenant is a grandparent, parent, wife, sister, or child of the seaman making the allotment.

(e) Before allotments to savings institutions other than savings banks, as defined in paragraph (c) of this section may be accepted, the seaman shall present satisfactory evidence that the accounts in the particular institution are insured by either the Federal Deposit Insurance Corporation or the Federal Savings and Loan Association.

(f) Allotments by masters of vessels are not authorized and should not be approved.

§ 15.01–5 Seaman may make more than one allotment.

Any seaman may stipulate in his articles of agreement for the payment of allotments to any or all of the persons or organizations enumerated in § 15.01–1: *Provided*, That the total amount of such allotments does not exceed the maximum amount permitted under § 15.10–5.

Subpart 15.05—Procedures Covering Allotments

§ 15.05–1 Allotments to be in writing.

All allotments executed by any seaman shall be in writing in triplicate on Form CG–722 and shall be approved by a shipping commissioner or deputy shipping commissioner, or Collector or Deputy Collector of Customs at ports where no shipping commissioner has been appointed, or consular officer of the United States.

§ 15.05–5 Execution of allotments.

All allotments shall be executed in triplicate on Form CG–722 by the seaman making the same and after the allotments are approved shall be distributed by the shipping commissioner, deputy shipping commissioner, Collector of Customs, Deputy Collector of Customs, or consular officer in the following manner:

(a) The original shall be sent to the seaman's employer.

(b) The duplicate shall be sent to the person or bank or institution in whose favor the allotment is drawn; and

(c) The triplicate shall be retained in the file of the official who approves the allotment.

§ 15.05–10 Effective date of allotment.

All allotments shall be effective as of the date when the wages of the seamen commence on the articles of agreement.

§ 15.05–15 Cancellation of allotment.

Whenever a seaman, before the expiration of the allotment period, severs his contractual relationship with the vessel upon which he was employed, the master of such vessel should notify the employer of the seaman, by the quickest means of communication available, of this fact. Upon the receipt of such information, the employer should notify the person in whose favor the allotment is drawn.

Subpart 15.10—Computing Allotments

§ 15.10–1 Wages upon which allotments may be based.

Allotments may be made by seamen only upon the amount of the wages for which they are signed on.

§ 15.10–5 Limitation on amount of allotment.

No allotment which calls for the payment of more than 90 percent of the wages upon which an allotment may be based (see § 15.10–1), after allowing for a deduction to cover the Federal withholding tax, shall be approved.

Subpart 15.15—Payment and Accounting Required

§ 15.15–1 Time of payment of allotments.

Allotments may stipulate that the payments may be made for a specified period of time or they may stipulate

that the payments be continued for the voyage of the vessel. No allotment which requires the employer of the seaman to commence payments under the same before fifteen days from the date of the allotment shall be authorized. Allotments can be made for semimonthly, monthly, or bimonthly payments.

§ 15.15–5 Payment of allotments.

The employer of the seaman shall make payments of the amount or amounts allotted by cash, check, or money order. All such payments shall be made in sufficient time to insure the receipt of the remittance at the time and place specified in the allotment.

§ 15.15–10 Accounting for payment.

The employer of the seaman shall produce evidence of the payment of all allotments listed in a vessel's articles of agreement to the shipping commissioner supervising the payment of the wages of the crew, unless this requirement is waived by any or all of the allotters.

PART 16—UNITED STATES SHIPPING COMMISSIONERS

Sec.
16.01 Shipping commissioners designated as enforcement officers.
16.05 Acceptance of unclaimed wages.
16.10 Payment of deceased or deserting seamen's wages.

AUTHORITY: The provisions of this Part 16 issued under sec. 7, 49 Stat. 1936, as amended; 46 U.S.C. 689. Treasury Department Order 120, July 31, 1950, 15 F.R. 6521.

§ 16.01 Shipping commissioners designated as enforcement officers.

(a) Section 7 of the act of June 25, 1936, as amended (49 Stat. 1936, 46 U.S.C. 689), makes it the duty of the Commandant, U.S. Coast Guard, to enforce the provisions of the above act through Collectors of Customs and other Government officers acting under the direction of the Coast Guard, and to make such rules and regulations as he may deem necessary to carry out the provisions of the said act.

(b) In order to enforce more effectually compliance with the provisions of this act, persons or officials performing United States shipping commissioners duties are hereby designated as enforcement officers for carrying out the provisions of the act.

§ 16.05 Acceptance of unclaimed wages.

(a) Shipping commissioners or employees shall not accept unclaimed wages of seamen except in the form of checks or duly recognized money orders. In cases where the advisability of accepting the personal check of a master is doubtful, a money order must be provided.

(b) Every effort should be made to discourage the leaving of unclaimed wages with shipping commissioners. The acceptance of these wages is outside of the duties of shipping commissioners and they are personally responsible therefor.

§ 16.10 Payment of deceased or deserting seamen's wages.

In the case of deceased or deserting seamen's wages, such wages must be paid in the form of a check or duly recognized money order, unless such payment is made direct to the shipping commissioner. In cases where the advisability of accepting the personal check of a master is doubtful, the payment must be made by money order or direct to the shipping commissioner in cash.

SUBCHAPTER C—UNINSPECTED VESSELS

PART 24—GENERAL PROVISIONS

Subpart 24.01—Authority and Purpose

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24.01–5 Assignment of functions.
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Subpart 24.05—Application

24.05–1 Vessels subject to the requirements of this subchapter.
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24.10–7 Commandant.
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24.10–15 Marine inspector or inspector.
24.10–17 Motorboat.
24.10–19 Motor vessel.
24.10–21 Officer in Charge, Marine Inspection.
24.10–23 Passenger.
24.10–25 Rules of the Road.
24.10–27 Vessel.

Subpart 24.15—Equivalents

24.15–1 Conditions under which equivalents may be used.
24.15–5 Canadian pleasure craft temporarily using navigable waters of the United States.

Subpart 24.20—General Marine Engineering Requirements

24.20–1 Marine engineering details.

AUTHORITY: The provisions of this Part 24 are issued under R.S. 4405, as amended, 4462, as amended, sec. 17, 54 Stat. 166, as amended; 46 U.S.C. 375, 416, 526p. Treasury Department Order 120, July 31, 1950, 15 F.R. 6521, unless otherwise noted.

Subpart 24.01—Authority and Purpose

§ 24.01–1 Purpose of regulations.

(a) The purpose of the regulations in this subchapter is to set forth uniform minimum requirements for motorboats, certain motor vessels, and barges carrying passengers when towed by motorboats or motor vessels in accordance with the intent of the Motorboat Act of April 25, 1940, as amended (54 Stat. 163–167; 46 U.S.C. 526–526t). The regulations are necessary to carry out the provisions of the Motorboat Act of April 25, 1940, and such regulations have the force of law.

§ 24.01–5 Assignment of functions.

(a) By Reorganization Plan No. 3 of 1946, effective July 16, 1946 (3 CFR, 1946 Supp), the marine inspection functions of the former Bureau of Marine Inspection and Navigation and its officers and employees were transferred to the Commandant, United States Coast Guard. By Reorganization Plan No. 26 of 1950, effective July 31, 1950 (15 F. R. 4935, 3 CFR, 1950 Supp., p. 178, 5 U. S. C. Note under 241), the functions formerly vested in the Commandant, United States Coast Guard, were transferred to the Secretary of the Treasury with certain specified exceptions. The Secretary of the Treasury by a order dated July 31, 1950 (15 F. R. 6521), delegated to the Commandant the functions formerly performed by him under Reorganization Plan No. 3 of 1946.

§ 24.01–10 Authority for regulations.

(a) *General.* (1) The authority to prescribe regulations generally is set forth in R. S. 4405 and 4462, as amended, and in section 17 of the Motorboat Act of April 25, 1940, as amended (46 U. S. C. 375, 416, 526p).

(b) *Lifesaving appliances.* (1) The regulations regarding lifesaving appliances interpret or apply section 6 of the Motorboat Act of April 25, 1940, as amended (46 U. S. C. 526e).

(c) *Fire protection equipment.* (1) The regulations regarding fire protection equipment interpret or apply section 8 of the Motorboat Act of April 25, 1940, as amended (46 U. S. C. 526g).

(d) *Flame arresters.* (1) The regulations regarding flame arresters interpret or apply section 10 of the Motorboat Act of April 25, 1940, as amended (46 U. S. C. 526i).

(e) *Ventilation of bilges.* (1) The regulations regarding ventilation of bilges interpret or apply section 11 of the Motorboat Act of April 25, 1940, as amended (46 U. S. C. 526j).

Subpart 24.05—Application

§ 24.05–1 Vessels subject to the requirements of this subchapter.

(a) This subchapter shall be applicable to all vessels indicated in Column 6 of Table 24.05–1 (a), and shall apply to all such United States flag vessels, and to all such foreign vessels, except as follows:

(1) Any vessel operating exclusively on inland waters which are not navigable waters of the United States.

(2) Any vessel while laid up and dismantled and out of commission.

(3) With the exception of vessels of the U. S. Maritime Administration, any vessel with title vested in the United States and which is used for public purposes.

TABLE 24.05-1(a)

Method of propulsion	Size or other limitations [1]	Classes of vessels (including motorboats) examined or inspected under various Coast Guard regulations [2]			
		Vessels inspected and certificated under Subchapter D—Tank Vessels [3]	Vessels inspected and certificated under either Subchapter H—Passenger Vessels [3 4 5] or Subchapter T—Small Passenger Vessels [3 5 6]	Vessels inspected and certificated under Subchapter I—Cargo and Miscellaneous Vessels [3 5]	Vessels subject to provisions of Subchapter C—Uninspected Vessels [3 5 8]
Column 1	Column 2	Column 3	Column 4	Column 5	Column 6
Steam	Vessels not over 65 feet in length.	All vessels carrying combustible or flammable liquid cargo in bulk.	All vessels carrying more than 6 passengers.[7]	All tugboats and towboats.	All vessels except those covered by columns 3, 4, and 5.[8]
	Vessels over 65 feet in length.	All vessels carrying combustible or flammable liquid cargo in bulk.[4]	1. All vessels carrying more than 12 passengers on an international voyage, except yachts. 2. All vessels of not over 15 gross tons which carry more than 6 passengers.[7] 3. All other vessels carrying passengers, except: a. Yachts. b. Documented cargo or tank vessels issued a permit to carry not more than 16 persons in addition to the crew. c. Towing and fishing vessels, in other than ocean and coastwise service, may carry persons on the legitimate business of the vessel, in addition to crew, but not to exceed one for each net ton of the vessel.	All vessels except those covered by columns 3 and 4.	None.
Motor	Vessels of not over 15 gross tons.	All vessels carrying combustible or flammable liquid cargo in bulk.	All vessels carrying more than 6 passengers.[7]	Those vessels carrying dangerous cargoes when required by 46 CFR Part 98 or 146.	All vessels except those covered by columns 3, 4, and 5.
	Vessels over 15 gross tons except seagoing motor vessels of 300 gross tons and over.	All vessels carrying combustible or flammable liquid cargo in bulk.[4]	1. All vessels carrying more than 12 passengers on an international voyage, except yachts. 2. All vessels not over 65 feet in length which carry more than 6 passengers.[7] 3. All other vessels of over 65 feet in length carrying passengers for hire except documented cargo or tank vessels issued a permit to carry not more than 16 persons in addition to the crew.	All vessels carrying freight for hire except those covered by columns 3 and 4.	All vessels except those covered by columns 3, 4, and 5.
	Seagoing motor vessels of 300 gross tons and over.	All vessels carrying combustible or flammable liquid cargo in bulk.[4]	1. All vessels carrying more than 12 passengers on an international voyage, except yachts. 2. All other vessels carrying passengers, except: a. Yachts. b. Documented cargo or tank vessels issued a permit to carry not more than 16 persons in addition to the crew.	All vessels except those covered by columns 3 and 4, and those engaged in the fishing, oystering, clamming, crabbing, or any other branch of the fishery, kelp, or sponge industry.	All vessels except those covered by columns 3, 4, and 5.
Sail	Vessels not over 700 gross tons.	All vessels carrying combustible or flammable liquid cargo in bulk.	All vessels carrying more than 6 passengers.[7]	Those vessels carrying dangerous cargoes when required by 46 CFR Part 98 or 146.	None.
	Vessels over 700 gross tons.	All vessels carrying combustible or flammable liquid cargo in bulk.	All vessels carrying passengers for hire.	Those vessels carrying dangerous cargoes when required by 46 CFR Part 98 or 146.	None.
Nonself-propelled	Vessels not over 100 gross tons.	All vessels carrying combustible or flammable liquid cargo in bulk.	All vessels carrying more than 6 passengers.[7]	Those vessels carrying dangerous cargoes when required by 46 CFR Part 98 or 146.	All barges carrying passengers except those covered by column 4.
	Vessels over 100 gross tons.	All vessels carrying combustible or flammable liquid cargo in bulk.	All vessels carrying passengers for hire.	All seagoing barges except those covered by columns 3 and 4; and those inland barges carrying dangerous cargoes when required by 46 CFR Part 98 or 146.	All barges carrying passengers except those covered by column 4.

[1] Where length is used in this table it means the length measured from end to end over the deck, excluding sheer. This expression "means a straight line measurement of the overall length from the foremost part of the vessel to the aftermost part of the vessel, measured parallel to the centerline."

[2] Subchapters E (Load Lines), F (Marine Engineering), J (Electrical Engineering), and N (Dangerous Cargoes) of this chapter may also be applicable under certain conditions.

[3] Public nautical schoolships, other than vessels of the Navy and Coast Guard, shall meet the requirements of Part 167 of Subchapter R (Nautical Schools) of this chapter. Civilian nautical schoolships, as defined by 46 U.S.C. 1331, shall meet the requirements of Subchapter H (Passenger Vessels) and Part 168 of Subchapter R (Nautical Schools) of this chapter.

[4] Subchapter H (Passenger Vessels) of this chapter covers only those vessels of 100 gross tons or more. Subchapter T (Small Passenger Vessels) of this chapter covers only those vessels of less than 100 gross tons.

[5] Vessels covered by Subchapters H (Passenger Vessels) or I (Cargo and Miscellaneous Vessels) of this chapter, where the principal purpose or use of the vessel is not for the carriage of liquid cargo, may be granted a permit to carry a limited amount of flammable or combustible liquid cargo in bulk. The portion of the vessel used for the carriage of the flammable or combustible liquid cargo shall meet the requirements of Subchapter D (Tank Vessels) in addition to the requirements of Subchapter H (Passenger Vessels) or I (Cargo and Miscellaneous Vessels) of this chapter.

[6] Any vessel on an ternational voyage is subject to the requirements of the International Convention for Safety of Life at Sea, 1960.

[7] The meaning of the term "passenger" is as defined in the Act of May 10, 1956 (sec. 1, 70 Stat. 151; 46 U.S.C. 390).

[8] Boilers and machinery are subject to examination on vessels over 40 feet in length.

§ 24.05–5 Specific application noted in text.

(a) At the beginning of the various parts, subparts, and sections, a more specific application is generally given for the particular portion of the text involved. This application sets forth the types, sizes, or services of vessels to which the text pertains, and in many cases limits the application of the text to vessels contracted for before or after a specific date. As used in this subchapter, the term "vessels contracted for" includes not only the contracting for the construction of a vessel, but also the contracting for a material alteration to a vessel, the contracting for the conversion of a vessel to a passenger vessel, and the changing of service or route of a vessel if such change increases or modifies the general requirements for the vessel or increases the hazards to which it might be subjected.

Subpart 24.10—Definition of Terms Used in This Subchapter

§ 24.10–1 Approved.

This term means approved by the Commandant unless otherwise stated.

§ 24.10–3 Carrying passengers for hire.

The carriage of any person or persons by a vessel for a valuable consideration, whether directly or indirectly flowing to the owner, charterer, operator, agent or any other person interested in the vessel.

§ 24.10–5 Carrying freight for hire.

The carriage of any goods, wares, or merchandise or any other freight for a valuable consideration, whether directly or indirectly flowing to the owner, charterer, operator, agent, or any other person interested in the vessel.

§ 24.10–7 Commandant.

This term means the Commandant of the Coast Guard.

§ 24.10–9 Coast Guard District Commander.

This term means an officer of the Coast Guard designated as such by the Commandant to command all Coast Guard activities within his district, which include the inspection, enforcement, and administration of Title 52, Revised Statutes, and acts amendatory thereof or supplemental thereto, and rules and regulations thereunder.

§ 24.10–11 Headquarters.

This term means the Office of the Commandant, Washington, D.C.

§ 24.10–13 International voyage.

(a) The term "international voyage," as used in this subchapter, shall have the same meaning as that contained in Regulation 2(d), Chapter I, of the International Convention for Safety of Life at Sea, 1960; i.e., " 'International voyage' means a voyage from a country to which the present Convention applies to a port outside such country, or conversely; and for this purpose every territory for the international relations of which a Contracting Government is responsible or for which the United Nations is the administering authority is regarded as a separate country."

(b) The International Convention for Safety of Life at Sea, 1960, does not apply to vessels "solely navigating the Great Lakes of North America and the River St. Lawrence as far east as a straight line drawn from Cap de Rosiers to West Point, Anticosti Island and, on the north side of Anticosti Island, the 63d Meridian." Accordingly, such vessels shall not be considered as being on an "international voyage" for the purpose of this subchapter.

(c) For the purposes of this subchapter the term "territory" as used in paragraph (a) of this section shall be considered to include the Commonwealth of Puerto Rico, the Canal Zone, all possessions of the United States, and all lands held by the United States under a protectorate or mandate.

(d) Although voyages between the continental United States and Hawaii or Alaska, and voyages between Hawaii and Alaska are not "international voyages" under the provisions of the International Convention for Safety of Life at Sea, 1960, such voyages are similar in nature and shall be considered as "international voyages" and subject to the same requirements for the purposes of this subchapter.

(E.O. 11239, July 31, 1965, 30 F.R. 9671, 3 CFR, 1965 Supp.)

§ 24.10–15 Marine inspector or inspector.

These terms mean any person from civilian or military branch of the Coast Guard assigned under the superintendence and direction of an Officer in Charge, Marine Inspection, or any other person as may be designated for the performance of duties with respect to the inspection, enforcement, and administration of Title 52, Revised Statutes, and acts amendatory thereof or supplemental thereto, and rules and regulations thereunder.

§ 24.10–17 Motorboat.

(a) This term means any vessel indicated in column 6 of Table 24.05–1(a), 65 feet in length or less which is propelled by machinery (including steam). The length shall be measured from end to end over the deck excluding sheer. This term includes a boat temporarily or permanently equipped with a detachable motor and any such boat when so propelled is subject to the applicable provisions of the act of April 25, 1940, as amended (46 U.S.C. 526–526u), and the regulations promulgated thereunder. For the purpose of this subchapter, motorboats are included under the term "vessel" unless specifically noted otherwise. The various classes of motorboats are as follows:

Class A—Any motorboat less than 16 feet in length.

Class 1—Any motorboat 16 feet or over and less than 26 feet in length.

Class 2—Any motorboat 26 feet or over and less than 40 feet in length.

Class 3—Any motorboat 40 feet or over and not more than 65 feet in length.

(b) The expression "length shall be measured from end to end over the deck excluding sheer" means a straight line measurement of the overall length from the foremost part of the vessel to the aftermost part of the vessel, measured parallel to the centerline. Bow sprits, bumpkins, rudders, outboard motor brackets, and similar fittings or attachments, are not to be included in the measurement. Length shall be stated in feet and inches.

§ 24.10–19 Motor vessel.

This term means any vessel more than 65 feet in length, which is propelled by machinery other than steam.

§ 24.10–21 Officer in Charge, Marine Inspection.

This term means any person from the civilian or military branch of the Coast Guard designated as such by the Commandant and who, under the superintendence and direction of the Coast Guard District Commander, is in charge of an inspection zone for the performance of duties with respect to the inspections, enforcement, and administration of Title 52, Revised Statutes, and acts amendatory thereof or supplemental thereto, and rules and regulations thereunder.

§ 24.10–23 Passenger.

A passenger is every person, other than the master and the members of the crew or other persons employed or engaged in any capacity on board a vessel in the business of that vessel. In the case of a vessel on an international voyage a child under one year of age is not counted as a passenger.

§ 24.10–25 Rules of the Road.

(a) The term "Rules of the Road" means the statutory and regulatory rules governing navigation of vessels. These rules are also published by the Coast Guard in pamphlet form as follows:

(1) Rules of the Road—International—Inland (CG–169).

(2) Rules of the Road—Great Lakes (CG–172).

(3) Rules of the Road—Western Rivers (CG–184).

(b) The current editions of the "Rules of the Road" pamphlets may be obtained from any Marine Inspection Office.

§ 24.10–27 Vessel.

Where the word "vessel" is used in this subchapter, it shall be considered to include all vessels indicated in Column 6 of Table 24.05–1(a), except as otherwise noted in this subpart.

Subpart 24.15—Equivalents

§ 24.15–1 Conditions under which equivalents may be used.

(a) Where in this subchapter it is provided that a particular fitting, material, appliance, apparatus, or equipment, or type thereof, shall be fitted or carried in a vessel, or that any particular provision shall be made or arrangement shall be adopted, the Commandant may accept in substitution therefor any other fitting,

material, apparatus, or equipment, or type thereof, or any other arrangement: *Provided*, That he shall have been satisfied by suitable trials that the fitting, material, appliance, apparatus, or equipment, or type thereof, or the provision or arrangement is at least as effective as that specified in this subchapter.

(b) In any case where it is shown to the satisfaction of the Commandant that the use of any particular equipment, apparatus, or arrangement not specifically required by law is unreasonable or impracticable, the Commandant may permit the use of alternate equipment, apparatus, or arrangement to such an extent and upon such conditions as will insure to his satisfaction, a degree of safety consistent with the minimum standards set forth in this subchapter.

§ 24.15–5 Canadian pleasure craft temporarily using navigable waters of the United States.

(a) Uninspected Canadian pleasure craft (uninspected vessels) temporarily using navigable waters of the United States may carry in lieu of the equipment required by the Motorboat Act of 1940 (46 U.S.C. 526–526u) and the regulations in this subchapter, the equipment as required by the laws of the Dominion of Canada and the regulations of the Department of Transport, Ottawa, Canada.

(Sec. 7, 72 Stat. 1757; 46 U.S.C. 527d. Treasury Department Order 167–32, September 23, 1958, 23 F.R. 7605)

Subpart 24.20—General Marine Engineering Requirements

§ 24.20–1 Marine engineering details.

(a) All marine engineering details relative to the design, construction, and testing of boilers and machinery on steam-propelled motorboats of over 40 feet in length will be found in Subchapter F (Marine Engineering) of this chapter.

(R.S. 4418, as amended; 46 U.S.C. 392. Treasury Department Order CGFR 56–28, July 24, 1956, 21 F.R. 5659)

PART 25—REQUIREMENTS

Subpart 25.01—Application

Sec.
25.01–1 Applicable to all vessels.

Subpart 25.05—Navigation Lights and Shapes

25.05–1 Vessels other than motorboats.
25.05–5 Motorboats.

Subpart 25.10—Whistles

25.10–1 Vessels other than sailing vessels, barges, and motorboats.
25.10–5 Motorboats operating on the high seas.
25.10–10 Motorboats operating on the navigable waters of the United States.

Subpart 25.15—Foghorns

25.15–1 Vessels other than motorboats.
25.15–5 Motorboats.

Subpart 25.20—Fog Sound Signal Devices

25.20–1 Vessels other than motorboats.
25.20–5 Motorboats operating on the high seas.
25.20–10 Motorboats operating on the navigable waters of the United States.

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25.25–1 Application.
25.25–5 General provisions.
25.25–10 Life preservers and other lifesaving equipment required.
25.25–15 Storage.
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25.30–10 Hand portable fire extinguishers and semiportable fire extinguishing systems.
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25.30–20 Fire extinguishing equipment required.
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Subpart 25.35—Backfire Flame Control

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Subpart 25.40—Ventilation

25.40–1 Tanks and engine spaces.

Subpart 25.45—Liquefied Petroleum Gas

25.45–1 Prohibited on vessels carrying passengers for hire.

AUTHORITY: The provisions of this Part 25 are issued under R.S. 4405, as amended, 4462, as amended, sec. 17, 54 Stat. 166, as amended; 46 U.S.C. 375, 416, 526p. Treasury Department Order 120, July 31, 1950, 15 F.R. 6521, unless otherwise noted.

Subpart 25.01—Application

§ 25.01–1 Applicable to all vessels.

(a) The provisions of this part shall apply to all vessels except as specifically noted.

Subpart 25.05—Navigation Lights and Shapes

§ 25.05–1 Vessels other than motorboats.

(a) All vessels other than motorboats shall be equipped with navigation lights and shapes as prescribed by law and regulation.

§ 25.05–5 Motorboats.

(a) All motorboats shall be equipped with navigation lights and shapes as prescribed by law and regulation.

Subpart 25.10—Whistles

§ 25.10–1 Vessels other than sailing vessels, barges, and motorboats.

(a) All vessels other than sailing vessels, barges, and motorboats shall be equipped with an efficient whistle or similar appliance to give the necessary whistle signals required by the Rules of the Road applicable to the waters on which the vessel is navigated.

§ 25.10–5 Motorboats operating on the high seas.

(a) All motorboats operating on the high seas outside the navigable waters of the United States shall meet the requirements for whistles or similar appliances prescribed by § 25.10–1 for vessels other than motorboats.

§ 25.10–10 Motorboats operating on the navigable waters of the United States.

(a) Motorboats operating on the navigable waters of the United States shall be provided with an efficient whistle or other sound producing mechanical device as set forth in Table 25.10–10(a), except:

(1) Commercial fishing motorboats may carry any device specified in Table 25.10–10 (a).

(2) Motorboats engaged in a race which has been previously arranged or announced, or while engaged in such navigation as is incidental to the tuning up of the motorboat and engines for the race, need not carry the devices required by Table 25.10–10 (a).

TABLE 25.10–10 (a)

Class of motorboat	Type of device
A	None.
1	Mouth, hand, or power operated, capable of producing a blast of 2 seconds or more duration, and audible for at least one-half mile.
2	Hand or power operated, capable of producing a blast of 2 seconds or more duration, and audible for a distance of at least 1 mile.
3	Power operated, capable of producing a blast of 2 seconds or more duration, and audible for a distance of at least 1 mile.

Subpart 25.15—Foghorns

§ 25.15–1 Vessels other than motorboats.

(a) All vessels other than motorboats shall be equipped with an efficient foghorn as prescribed by the Rules of the Road applicable to the waters on which the vessel is navigated. On vessels in ocean or coastwise service, the foghorn shall be sounded by mechanical means.

§ 25.15–5 Motorboats.

(a) All motorboats operating on the high seas outside the navigable waters of the United States shall meet the requirements for fog horns prescribed by § 25.15–1 for vessels other than motorboats.

Subpart 25.20—Fog Sound Signal Devices

§ 25.20–1 Vessels other than motorboats.

(a) All vessels other than motorboats shall be provided with fog bells as prescribed by the Rules of the Road applicable to the waters on which the vessel is operated.

(b) All vessels of more than 350 feet in length shall be provided with a fog gong which will produce a sound easily distinguishable from the sound of the bell required by paragraph (a) of this section, and shall have a range of audibility approximating that of the bell. Vessels operating exclusively on the Great Lakes and the inland waters of the United States shall be exempt from this section.

§ 25.20–5 Motorboats operating on the high seas.

(a) All motorboats operating on the high seas outside the navigable waters of the United States shall meet the requirements for fog bells prescribed by § 25.20–1 for vessels other than motorboats.

§ 25.20–10 Motorboats operating on the navigable waters of the United States.

(a) When operating on the navigable waters of the United States, motorboats of Classes A and 1 are not required to carry fog bells. However, motorboats of Classes 2 and 3 operating on the navigable waters of the United States shall be provided with an efficient fog bell, except:

(1) Motorboats engaged in a race which has been previously arranged or announced, or while engaged in such navigation as is incidental to the tuning up of the motorboat and engines for the race, need not carry the fog bell required by this section.

Subpart 25.25—Life Preservers and Other Lifesaving Equipment

§ 25.25–1 Application.

(a) The provisions of this subpart, with the exception of § 25.25–90, shall apply to all vessels contracted for on or after November 19, 1952. Vessels contracted for prior to that date shall meet the requirements of § 25.25–90.

§ 25.25–5 General provisions.

(a) Where equipment in this subpart is required to be of an approved type, such equipment requires the specific approval of the Commandant. Such approvals are published in the FEDERAL REGISTER, and in addition, are contained in Coast Guard publication CG–190, "Equipment Lists."

(b) Specifications for items of equipment required in this subpart have been promulgated and are contained in Subchapter Q (Specifications) of this chapter. The markings specified for a specific item of approved equipment by that subchapter shall be attached to or imprinted on the equipment as prescribed in the specifications, and the information required in such markings shall be legible in order for such item to be accepted as equipment of an approved type required by this subchapter.

(c) All life preservers shall be of an approved type, constructed in accordance with the applicable provisions of Subpart 160.002, 160.005 or 160.055 of Subchapter Q (Specifications) of this chapter.

(1) All kapok and fibrous glass life preservers which do not have plastic-covered pad inserts as required by Subparts 160.002 and 160.005 shall not be acceptable as equipment required by this subchapter.

(2) Cork and balsa wood life preservers, constructed in accordance with the applicable provisions of Subpart 160.003 or 160.004 and manufactured as approved life preservers prior to July 1, 1965, may be accepted as new or replacement equipment required by this subchapter providing such life preservers are serviceable and in good condition.

(d) All wood floats shall be of a type constructed in accordance with Subpart 160.039 of Subchapter Q (Specifications) of this chapter.

(e) All buoyant cushions shall be of an approved type, constructed in accordance with the applicable provisions of Subpart 160.048 or 160.049 of Subchapter Q (Specifications) of this chapter.

(1) All kapok and fibrous glass buoyant cushions which do not have plastic-covered pad inserts as required by Subpart 160.048 shall not be acceptable as equipment required by this subchapter.

(f) All ring life buoys shall be of an approved type, constructed in accordance with Subpart 160.009 or 160.050 of Subchapter Q (Specifications) of this chapter.

(g) All buoyant vests shall be of an approved type constructed in accordance with Subpart 160.047 or 160.052 of Subchapter Q (Specifications) of this chapter.

(h) Special purpose water safety buoyant devices (such as water ski vests, hunters buoyant jackets, etc.), in order to be of approved type, shall be constructed, listed and labeled in accordance with Subpart 160.064 of Subchapter Q (Specifications) of this chapter.

(Sec. 6, 54 Stat. 164, as amended; 46 U.S.C. 526e)

§ 25.25–10 Life preservers and other lifesaving equipment required.

(a) All motor vessels shall be provided with an approved life preserver for each person on board. Motor vessels carrying passengers for hire shall be provided with an approved adult type life preserver for each person carried, and, in addition, unless the service is such that children are never carried, there shall be provided a number of approved life preservers suitable for children equal to at least 10 percent of the total number of persons carried.

(b) All motorboats shall carry lifesaving equipment as follows:

(1) Motorboats which carry passengers for hire shall be provided with an approved adult type life preserver for each person carried. In addition, unless the service is such that children are never carried, there shall be provided a number of approved life preservers suitable for children equal to at least 10 percent of the total number of persons carried. Such motorboats may carry special purpose water safety buoyant devices of approved type as excess equipment.

(2) Motorboats of Class 3 not carrying passengers for hire shall carry an approved life preserver or ring life buoy for each person on board. Such motorboats may carry special purpose water safety buoyant devices of approved type as excess equipment.

(3) Commercial fishing motorboats of Class 3 shall carry an approved life preserver, ring life buoy, or wood float for each person on board.

(4) Commercial fishing motorboats of Class A, 1, or 2 shall carry an approved life preserver, ring life buoy, buoyant vest, buoyant cushion, or wood float for each person on board.

(5) All other motorboats not otherwise specifically provided for shall carry an approved life preserver, ring life buoy, buoyant vest, special purpose water safety buoyant device, or buoyant cushion for each person on board.

(c) All barges carrying passengers for hire shall be provided with an approved adult type life preserver for each person carried, and in addition, unless the service is such that children are never carried, there shall be provided a number of approved life preservers suitable for children equal to at least 10 percent of the total number of persons carried when such barges are regularly operated with motorboats or motor vessels or steam vessels.

§ 25.25–15 Storage.

(a) The lifesaving equipment on all vessels shall be so placed as to be readily accessible.

§ 25.25–20 Condition.

(a) The lifesaving equipment required by this subpart shall be in good and serviceable condition.

§ 25.25–90 Vessels contracted for prior to November 19, 1952.

(a) Vessels contracted for prior to November 19, 1952, shall meet the applicable provisions of §§ 25.25–5 through 25.25–15 insofar as the number of items of equipment and the method of stowage are concerned.

(b) Existing items of equipment, previously approved, but not meeting the applicable specifications may be continued in service so long as they are serviceable and in good condition, except that:

(1) All kapok and fibrous glass life preservers which do not have plastic-covered pad inserts as required by Subparts 160.002 and 160.005 shall not be acceptable as equipment required by this subchapter.

(2) All kapok and fibrous glass buoyant cushions which do not have plastic-covered pad inserts as required by Subpart 160.048 shall not be acceptable as equipment required by this subchapter.

(c) All new installations and replacements shall meet the applicable requirements or specifications as described in §§ 25.25–5 through 25.25–15.

Subpart 25.30—Fire Extinguishing Equipment

§ 25.30–1 Application.

(a) The provisions of this subpart, with the exception of § 25.30–90, shall apply to all vessels contracted for on or after November 19, 1952. Vessels contracted for prior to that date shall meet the requirements of § 25.30–90.

§ 25.30–5 General provisions.

(a) Where equipment in this subpart is required to be of an approved type, such equipment requires the specific approval of the Commandant. Such approvals are published in the FEDERAL REGISTER, and in addition, are contained in Coast Guard publication CG–190, "Equipment Lists."

(b) All hand portable fire extinguishers, semiportable fire extinguishing systems, and fixed fire extinguishing systems shall be of an approved type.

§ 25.30–10 Hand portable fire extinguishers and semiportable fire extinguishing systems.

(a) Hand portable fire extinguishers and semiportable fire extinguishing systems are classified by a combination letter and number symbol. The letter indicating the type of fire which the unit could be expected to extinguish, and the number indicating the relative size of the unit.

(b) For the purpose of this subchapter, all required hand portable fire extinguishers and semiportable fire extinguishing systems are of the "B" type; i.e., suitable for extinguishing fires involving flammable liquids, greases, etc.

(c) The number designations for size will start with "I" for the smallest to "V" for the largest. For the purpose of this subchapter, only sizes I through III will be considered. Sizes I and II are considered hand portable fire extinguishers and sizes III, IV, and V are considered semiportable fire extinguishing systems which shall be fitted with suitable hose and nozzle or other practicable means so that all portions of the space concerned may be covered. Examples of size graduations for some of the typical hand portable fire extinguishers and semiportable fire extinguishing systems are set forth in Table 25.30–10 (c).

TABLE 25.30–10 (c)

Classification		Foam, gallons	Carbon dioxide, pounds	Dry chemical, pounds
Type	Size			
B	I	1¼	4	2
B	II	2½	15	10
B	III	12	35	20

(d) All hand portable fire extinguishers and semiportable fire extinguishing systems shall have permanently attached thereto a metallic name plate giving the name of the item, the rated capacity in gallons, quarts, or pounds, the name and address of the person or firm for whom approved, and the identifying mark of the actual manufacturer.

(e) Vaporizing-liquid type fire extinguishers containing carbon tetrachloride or chlorobromomethane or other toxic vaporizing liquids shall not be acceptable as equipment required by this subchapter.

(f) Hand portable or semiportable extinguishers which are required on their name plates to be protected from freezing shall not be located where freezing temperatures may be expected.

§ 25.30–15 Fixed fire extinguishing systems.

(a) When a fixed fire extinguishing system is installed, it shall be of an approved carbon dioxide type, designed and installed in agreement with the applicable provisions of Subpart 76.15 of Subchapter H (Passenger Vessels) of this chapter.

§ 25.30–20 Fire extinguishing equipment required.

(a) *Motorboats.* (1) All motorboats shall carry at least the minimum number of hand portable fire extinguishers set forth in Table 25.30–20(a)(1), except that motorboats less than 26 feet in length, propelled by outboard motors and not carrying passengers for hire, need not carry such portable fire extinguishers if the construction of such motorboats will not permit the entrapment of explosive or flammable gases or vapors.

TABLE 25.30–20(a)(1)

Class of motorboat	Length, feet	Minimum number of B–I hand portable fire extinguishers required [1]	
		No fixed fire extinguishing system in machinery space	Fixed fire extinguishing system in machinery space
A	Under 16	1	0
1	16 and over, but under 26	1	0
2	26 and over, but under 40	2	1
3	40 and over, but not over 65.	3	2

[1] One B–II hand portable fire extinguisher may be substituted for two B–I hand portable fire extinguishers.

(2) The intent of this regulation is illustrated in Figure 25.30–20(a1) where fire extinguishers are required if any one or more of the specified conditions exist, and in Figure 25.30–20(a2) where specified conditions do not, in themselves, require that fire extinguishers be carried.

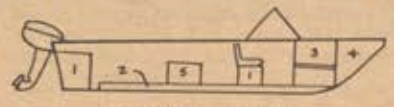


FIGURE 25.30–20(a1)

Fire extinguishers are required if any one or more of the following conditions exist (numbers identifying conditions are the same as those placed in Figure 25.30–20(a1):

1. Closed compartment under thwarts and seats wherein portable fuel tanks may be stored.
2. Double bottoms not sealed to the hull or which are not completely filled with flotation material.
3. Closed living spaces.
4. Closed stowage compartments in which combustible or flammable materials are stowed.
5. Permanently installed fuel tanks.

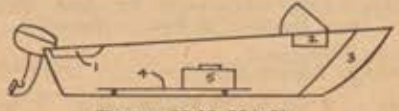


FIGURE 25.30–20(a2).

The following conditions do not, in themselves, require that fire extinguishers be carried (numbers identifying conditions are the same as those placed in Figure 25.30–20(a2):

1. Bait wells.
2. Glove compartments.
3. Buoyant flotation material.
4. Open slatted flooring.
5. Ice chests.

(b) *Motor vessels.* (1) All motor vessels shall carry at least the minimum number of hand portable fire extinguishers set forth in Table 25.30–20 (b) (1).

TABLE 25.30–20 (b) (1)

Gross tonnage		Minimum number of B–II hand portable fire extinguishers
Over	Not over	
----	50	1
50	100	2
100	500	3
500	1,000	6
1,000	----	8

(2) In addition to the hand portable fire extinguishers required by Subparagraph (1) of this paragraph, the following fire-extinguishing equipment shall be fitted in the machinery space:

(i) One Type B–II hand portable fire extinguisher shall be carried for each 1,000 B. H. P. of the main engines or fraction thereof. However, not more than 6 such extinguishers need be carried.

(ii) On motor vessels of over 300 gross tons, either one Type B–III semiportable fire-extinguishing system shall be fitted, or alternatively, a fixed fire-extinguishing system shall be fitted in the machinery space.

(c) *Barges carrying passengers.* (1) Every barge of 65 feet in length or less while carrying passengers when towed or pushed by a motorboat, motor vessel, or steam vessel shall be fitted with hand portable fire extinguishers as required by Table 25.30–20(a)(1), depending upon the length of the barge.

(2) Every barge of over 65 feet in length while carrying passengers when towed or pushed by a motorboat, motor vessel, or steam vessel shall be fitted with hand portable fire extinguishers as required by Table 25.30–20(b)(1), depending upon the gross tonnage of the barge.

§ 25.30–90 Vessels contracted for prior to November 19, 1952.

(a) Vessels contracted for prior to November 19, 1952, shall meet the applicable provisions of §§ 25.30–5 through 25.30–20 insofar as the number and general type of equipment is concerned. Existing items of equipment and installations previously approved but not meeting the applicable requirements for type approval may be continued in service so long as they are in good condition. All new installations and replacements shall meet the requirements of §§ 25.30–5 through 25.30–20.

Subpart 25.35—Backfire Flame Control

§ 25.35–1 Requirements.

(a) Every gasoline engine installed in a motorboat or motor vessel after April 25, 1940, except outboard motors, shall be equipped with an acceptable means of backfire flame control.

(b) Installations made before November 19, 1952, need not meet the detailed requirements of this subpart and may be continued in use as long as they are serviceable and in good condition. Replacements shall meet the applicable conditions in this section.

(c) Installations consisting of backfire flame arresters bearing basic Approval No. 162.015 may be continued in use as long as they are serviceable and in good condition. Replacements shall meet the applicable conditions in this section.

(d) Installations consisting of engine air and fuel induction system and given a basic Approval No. 162.015 may be continued in use as long as they are serviceable and in good condition. Replacements shall meet the applicable conditions in this section.

(e) The following are acceptable means of backfire flame control for gasoline engines:

(1) A backfire flame arrester constructed in accordance with the specification regulations contained in Subpart 162.041 of Subchapter Q (Specifications) of this chapter and it shall be specifically approved by the Commandant. The flame arrester shall be suitably secured to the air intake with flametight connection.

(2) An engine air and fuel induction system which provides adequate protection from propagation of backfire flame to the atmosphere equivalent to that provided by an approved backfire flame arrester. A gasoline engine utilizing an air and fuel induction system, and operated without an approved backfire flame arrester shall have such installation tested and labeled in accordance with the specifications contained in Subpart 162.042 of Subchapter Q (Specifications) of this chapter and such system shall be specifically approved by the Commandant.

(3) Any attachment to the carburetor or location of the engine air induction system by means of which flames caused by engine backfire will be dispersed to the atmosphere outside the vessel in such a manner that the flames will not endanger the vessel, persons on board, or nearby vessels and structures. All attachments shall be of metallic construction with flametight connections and firmly secured to withstand vibration, shock, and engine backfire. Such installations do not require formal approval and labeling, but will be accepted by Coast Guard law enforcement officers on the basis of compliance with this subpart.

(4) Where manufacturers wish to produce vessels having an integrated engine-vessel design, a pre-market approval of an engine air induction system is available. Such an installation shall be tested and labeled in accordance with the specifications contained in Subpart 162.043 of Subchapter Q (Specifications) of this chapter and such system shall be specifically approved by the Commandant.

(Interpret or apply sec. 10, 54 Stat. 165, as amended, 46 U.S.C. 526i)

Subpart 25.40—Ventilation

§ 25.40–1 Tanks and engine spaces.

(a) All motorboats or motor vessels, except open boats, the construction or decking over of which is commenced after April 25, 1940, and which use fuel having a flashpoint of 110° F. or less, shall have at least 2 ventilator ducts, fitted with cowls or their equivalent, for the efficient removal of explosive or flammable gases from the bilges of every engine and fuel tank compartment. There shall be at least one exhaust duct installed so as to extend from the open atmosphere to the lower portion of the bilge and at least one intake duct installed so as to extend to a point at least midway to the bilge or at least below the level of the carburetor air intake. The cowls shall be located and trimmed for maximum effectiveness and in such a manner so as to prevent displaced fumes from being recirculated.

(b) As used in this section, the term "open boats" means those motorboats or motor vessels with all engine and fuel tank compartments, and other spaces to which explosive or flammable gases and vapors from these compartments may flow, open to the atmosphere and so arranged as to prevent the entrapment of such gases and vapors within the vessel.

(c) Where alterations are needed for existing motorboats or motor vessels to comply with the requirements in this section, such alterations shall be accomplished as soon as practicable but in any case shall be completed by June 1, 1966.

(Sec. 11, 54 Stat. 165, as amended; 46 U.S.C. 526j)

Subpart 25.45—Liquefied Petroleum Gas

§ 25.45–1 Prohibited on vessels carrying passengers for hire.

(a) On vessels carrying passengers for hire, the use of liquefied petroleum gases and certain flammable liquids for cooking, heating, or lighting is prohibited by Parts 146 and 147 of Subchapter N (Dangerous Cargoes) of this chapter.

(R.S. 4472, as amended; 46 U.S.C. 170)

PART 26—OPERATIONS

Subpart 26.01—Application

Sec.
26.01–1 Applicable to all vessels.

Subpart 26.03—Special Operating Requirements

26.03–1 Reckless or negligent operation prohibited by law.
26.03–5 Action required after accident.

Subpart 26.05—Penalties

26.05–1 General.
26.05–5 Reckless operation.

Subpart 26.10—Assessment, Collection, Mitigation, Remission of Fines or Penalties

26.10–1 General.
26.10–5 Procedures.

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AUTHORITY: The provisions of this Part 26 are issued under R.S. 4405, as amended, 4462, as amended, sec. 17, 54 Stat. 166, as amended; 46 U.S.C. 375, 416, 526p. Treasury Department Order 120, July 31, 1950, 15 F.R. 6521, unless otherwise noted.

Subpart 26.01—Application

§ 26.01–1 Applicable to all vessels.

(a) The provisions of this part shall apply to all vessels except as specifically noted.

Subpart 26.03—Special Operating Requirements

§ 26.03–1 Reckless or negligent operation prohibited by law.

Subsection 13 (a) of the Act of April 25, 1940, as amended (46 U.S.C. 526l), reads as follows:

No person shall operate any motorboat or any vessel in a reckless or negligent manner so as to endanger the life, limb, or property of any person. To "operate" means to navigate or otherwise use a motorboat or a vessel.

§ 26.03–5 Action required after accident.

(a) Whenever an undocumented vessel is involved in a collision, accident, or other casualty, the operator shall:

(1) Comply with requirements in subsection 13(b) of the Act of April 25, 1940, as amended (46 U. S. C. 526l), which reads as follows:

In the case of collision, accident, or other casualty involving a motorboat or other vessel subject to this Act, it shall be the duty of the operator, if and so far as he can do so without serious danger to his own vessel, or persons aboard, to render such assistance as may be practicable and necessary to other persons affected by the collision, accident, or other casualty in order to save them from danger caused by the collision, accident, or casualty. He shall also give his name, address, and identification of his vessel to any person injured and to the owner of any property damaged. The duties imposed by this subsection shall be in addition to any duties otherwise provided by law.

(b) See Subpart 173.01 of Part 173 of Subchapter S (Numbering of Undocumented Vessels, Statistics on Numbering, and "Boating Accident Reports" and Accident Statistics) of this chapter for requirements governing "boating accident reports."

Subpart 26.05—Penalties

§ 26.05–1 General.

(a) If any motorboat or motor vessel subject to any of the provisions of the Act of April 25, 1940, as amended (54 Stat. 163–167, as amended; 46 U.S.C. 526–526u), is operated or navigated in violation of said Act or any of the applicable regulations in this chapter, the owner or operator, either one or both of them, is subject to the penalty in section 16, as amended (46 U.S.C 526o), which reads as follows:

If any motorboat or vessel subject to any of the provisions of this Act is operated or navigated in violation of this Act or any regulation issued thereunder, the owner or operator, either one or both of them, shall, in addition to any other penalty prescribed by law, be liable to a penalty of $100: *Provided*, That in the case of motorboats or vessels subject to the provisions of this Act carrying passengers for hire, a penalty of $200 shall be imposed on the owner or operator, either one or both of them, thereof for any violation of section 6, 7, or 8 of this Act or of

any regulations pertaining thereto. For any penalty incurred under this section the motorboat or vessel shall be held liable and may be proceeded against by way of libel in the district court of any district in which said motorboat or vessel may be found.

§ 26.05–5 Reckless operation.

(a) Any person who shall operate a motorboat or any vessel in a reckless or negligent manner is subject to the following penalty:

SEC. 14. Any person who shall operate any motorboat or any vessel in a reckless or negligent manner so as to endanger the life, limb, or property of any person shall be deemed guilty of a misdemeanor and on conviction thereof by any court of competent jurisdiction shall be punished by a fine not exceeding $2,000, or by imprisonment for a term of not exceeding one year, or by both such fine and imprisonment, at the discretion of the court. (Apr. 25, 1940, sec. 14; 54 Stat. 166; 46 U.S.C. 526m.)

Subpart 26.10—Assessment, Collection, Mitigation, Remission of Fines or Penalties

§ 26.10–1 General.

(a) The assessment, collection, mitigation, and remission of any fine, penalty, or forfeiture incurred under the Act of April 25, 1940, as amended, are authorized by section 17 (46 U.S.C. 526p), which reads in part as follows:

* * * The Commandant of the Coast Guard or any officer of the Coast Guard authorized by the Commandant may, upon application therefor, remit or mitigate any fine, penalty or forfeiture incurred under this Act or any regulations thereunder relating to motorboats or vessels, except the penalties provided in section 14 hereunder. * * *

(b) The assessment, collection, mitigation, and remission of penalties incurred under the Federal Boating Act of 1958 are authorized by subsection 8(b) (46 U.S.C. 527e), which reads as follows:

The Secretary may assess and collect any penalty incurred under this Act or any regulations prescribed pursuant to section 7 of this Act. The Secretary may, in his discretion, remit or mitigate any penalty imposed under this section, or discontinue prosecution therefor on such terms as he may deem proper.

§ 26.10–5 Procedures.

(a) Violations or maritime safety, navigation and vessel inspection laws, as well as rules and regulations prescribed thereunder, administered and enforced by the Coast Guard are reported by Coast Guard personnel detecting such violations to the Commander of the Coast Guard district in which the alleged violations occurred. The alleged offender will be informed of the nature of the violation.

(b) The procedures for the assessment, collection, remission, or mitigation are set forth in §§ 2.50–1 to 2.50–40 of Subchapter A (Procedures Applicable to the Public) of this chapter.

Subpart 26.15—Boarding

§ 26.15–1 May board at any time.

(a) In addition to any other authority provided by law, the boarding of vessels is authorized by subsection 8(c) of the Federal Boating Act of 1958 (46 U.S.C. 527e(c)), which reads as follows:

Commissioned, warrant, and petty officers of the Coast Guard may board any vessel required to be numbered under this Act at any time such vessel is found upon the navigable waters of the United States, the Commonwealth of Puerto Rico, the Virgin Islands, Guam, and the District of Columbia, or on the high seas, address inquiries to those on board, require appropriate proof of identification therefrom, examine the certificate of number issued under this Act, or in the absence of such certificate require appropriate proof of identification of the owner of the vessel, and, in addition, examine such vessel for compliance with this Act, the Act of April 25, 1940, as amended, and the applicable rules of the road.

(b) To facilitate the boarding of vessels by the commissioned, warrant, and petty officers of the Coast Guard in the exercise of their authority, every vessel subject to the Federal Boating Act of 1958, or the Act of April 25, 1940, as amended (46 U.S.C. 526–526u), if under way and upon being hailed by a Coast Guard vessel or patrol boat, shall stop immediately and lay to, or shall maneuver in such a way as to permit the boarding officer to come aboard. Failure to stop to permit a boarding officer to board a vessel or refusal to comply will subject the operator or owner to penalties provided in these laws.

(c) Coast Guard boarding vessels will be identified by the display of the Coast Guard ensign as a symbol of authority and the Coast Guard personnel will be dressed in Coast Guard uniform. The Coast Guard boarding officer upon boarding a vessel will identify himself to the master, owner, or operator and explain his mission.

(Interpret or apply sec. 7, 72 Stat. 1757; 46 U.S.C. 527d. Treasury Department Order 167–32, Sept. 23, 1958, 23 F.R. 7605)

Subpart 26.20—Exhibition of Motorboat Operator's License

§ 26.20–1 Must be available.

(a) Any person to whom a license as a motorboat operator has been issued shall have such license in his possession and available for immediate production to any Coast Guard boarding officer at all times during which any vessel which he is operating is carrying passengers for hire.

(Sec. 7, 54 Stat. 165, as amended; 46 U.S.C. 526f. Treasury Department Order 167–20, June 18, 1956, 21 F.R. 4894)

Subpart 26.25—Crew Requirements

§ 26.25–1 Licensed personnel.

(a) Every motorboat, as defined by the Act of April 25, 1940, as amended (46 U.S.C. 526), and any other vessel of fifteen gross tons or less propelled by machinery other than steam, while carrying passengers for hire, shall be operated or navigated by a person duly licensed for such service by the Coast Guard. This licensed operator shall be in charge of such motorboat or vessel, regardless of whether or not the passengers carried for hire are on such motorboat or vessel or are carried on a nonself-propelled vessel being towed or pushed by such motorboat or vessel. See § 157.30–30 of Subchapter P (Manning of Vessels) for special provisions with regard to use of superior licenses for motorboat operator's license.

(b) Certain uninspected vessels of 200 gross tons and upward are required to carry licensed officers. For details of these provisions see Subchapter P (Manning of Vessels) of this chapter, and the applicable law.

§ 26.25–5 Manning.

(a) Certain provisions with regard to requirements for able seamen, division of crew into watches, and citizenship of crew which are contained in various navigation and vessel inspection laws may apply to uninspected vessels operating on ocean, coastwise or Great Lakes waters. For details of these provisions see Subchapter P (Manning of Vessels) of this chapter and the applicable law.

SUBCHAPTER D—TANK VESSELS

PART 30—GENERAL PROVISIONS

Subpart 30.01—Administration

Sec.

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30.01–5 Application of regulations—TB/ALL.
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30.10-67 Tankship—T/ALL.
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Subpart 30.15—Equivalents

30.15-1 Conditions under which equivalents may be used—TB/ALL.

Subpart 30.20—Enforcement and Rights of Appeal

30.20-1 Enforcement—TB/ALL.
30.20-10 Penalties for violations of tank vessel regulations—TB/ALL.
30.20-50 Right of appeal—TB/ALL.

AUTHORITY: The provisions of this Part 30 issued under R.S. 4405, as amended, 4417a, as amended, 4462, as amended; 46 U.S.C. 375, 391a, 416. Interpret or apply sec. 3, 68 Stat. 675; 50 U.S.C. 198; E.O. 11239, July 31, 1965, 30 F.R. 9671, 3 CFR 1965 Supp. Treasury Department Orders 120, July 31, 1950, 15 F.R. 6521; 167-14, Nov. 26, 1954, 19 F.R. 8026, unless otherwise noted.

Subpart 30.01—Administration

§ 30.01-1 Basis and purpose of regulations—TB/ALL.

By virtue of authority vested in the Commandant of the Coast Guard by Treasury Department Order No. 120, dated July 31, 1950 (15 F.R. 6521), and in accordance with R.S. 4405 and 4417a, as amended, and sec. 3(c) of the Act of August 9, 1954 (46 U. S. C. 375, 391a, 50 U. S. C. 198), the rules and regulations in this subchapter are prescribed for all tank vessels in accordance with the intent of the various statutes and to obtain their correct and uniform administration.

§ 30.01-5 Application of regulations—TB/ALL.

(a) The regulations in this subchapter contain requirements for materials, design construction, inspection, manning, and operation of tank vessels, including handling and stowage of cargo and duties of officers and crew. However, vessels certificated as passenger, cargo or miscellaneous vessels, where the principal purpose or use of the vessel is not for the carriage of flammable or combustible liquid cargo in bulk, may be granted a permit to carry limited quantities of flammable or combustible liquid cargo in bulk in the grades indicated:

(1) Passenger vessels:

(i) Grade E in integral tanks or in approved portable containers of the type described in Subpart 98.35 in Part 98 of Subchapter I (Cargo and Miscellaneous Vessels) of this chapter.

(ii) Grade D in portable containers in accordance with Part 146 of Subchapter N (Dangerous Cargoes) of this chapter.

(2) Cargo vessels:

(i) Grades D and E in integral tanks or in approved portable containers in accordance with Subpart 98.35 in Part 98 of Subchapter I (Cargo and Miscellaneous Vessels) of this chapter.

(ii) Grades A and lower in portable containers in accordance with Part 146 of Subchapter N (Dangerous Cargoes) of this chapter.

(3) Miscellaneous vessels, such as cable, salvage, pile driving, and oil drilling rig vessels:

(i) Grades B and lower in fixed independent or integral tanks when specially authorized by the Commandant.

(b) The requirements of this subchapter are divided into parts as follows:

(1) Inspection and certification.
(2) Special equipment, machinery, and hull requirements.
(3) Lifesaving appliances.
(4) Firefighting equipment.
(5) Operations.
(6) Elevated temperature cargoes.
(7) Liquefied flammable gases.
(8) Flammable or combustible liquids having lethal characteristics.
(9) Special construction, arrangement, and other provisions for carrying certain flammable or combustible dangerous cargoes in bulk.

(c) The vessels and services to which each regulation applies are indicated by letters in the heading of the section or paragraph. The first letter or two letters indicate the type of vessel and the letter or letters following the oblique line indicate the waters in which such vessels may operate. These letters are described as follows:

(1) "T" signifies a tankship.
(2) "B" signifies a tank barge when it precedes an oblique line; or it signifies service on bays, sounds, and lakes other than the Great Lakes when it follows an oblique line.
(3) "ALL" signifies service on all waters.
(4) "O" signifies service on ocean waters.
(5) "C" signifies services on coastwise waters.
(6) "L" signifies service on Great Lakes' waters.
(7) "R" signifies service on river waters.

(d) This subchapter shall be applicable to all United States flag vessels indicated in Column 3 of Table 30.01-5(d), except as follows:

(1) Any vessel operating exclusively on inland waters which are not navigable waters of the United States.
(2) Any vessel while laid up and dismantled and out of commission.
(3) With the exception of vessels of the U. S. Maritime Administration, any vessel with title vested in the United States and which is used for public purposes.

TABLE 30.01-5(d)

Method of propulsion	Size or other limitations [1]	Classes of vessels (including motorboats) examined or inspected under various Coast Guard regulations [1]			
		Vessels inspected and certificated under Subchapter D—Tank Vessels [2]	Vessels inspected and certificated under either Subchapter H—Passenger Vessels [2 3 4] or Subchapter T—Small Passenger Vessels [2 3 4]	Vessels inspected and certificated under Subchapter I—Cargo and Miscellaneous Vessels [2 4]	Vessels subject to provisions of Subchapter C—Uninspected Vessels [2 3 4]
Column 1	Column 2	Column 3	Column 4	Column 5	Column 6
Steam	Vessels not over 65 feet in length.	All vessels carrying combustible or flammable liquid cargo in bulk.	All vessels carrying more than 6 passengers.[7]	All tugboats and towboats.	All vessels except those covered by columns 3, 4 and 5.[8]
	Vessels over 65 feet in length.	All vessels carrying combustible or flammable liquid cargo in bulk.[5]	1. All vessels carrying more than 12 passengers on an international voyage, except yachts. 2. All vessels of not over 15 gross tons which carry more than 6 passengers.[7] 3. All other vessels carrying passengers, except: a. Yachts. b. Documented cargo or tank vessels issued a permit to carry not more than 16 persons in addition to the crew. c. Towing and fishing vessels, in other than ocean and coastwise service, may carry persons on the legitimate business of the vessel, in addition to crew, but not to exceed one for each net ton of the vessel.	All vessels except those covered by columns 3 and 4.	None.

See footnotes at end of table.

TABLE 30.01-5(d)—Continued

Method of propulsion	Size or other limitations [1]	Classes of vessels (including motorboats) examined or inspected under various Coast Guard regulations [1]			
		Vessels inspected and certificated under Subchapter D—Tank Vessels [2]	Vessels inspected and certificated under either Subchapter H—Passenger Vessels [2] [3] [4] or Subchapter T—Small Passenger Vessels [2] [4]	Vessels inspected and certificated under Subchapter I—Cargo and Miscellaneous Vessels [2] [5]	Vessels subject to provisions of Subchapter C—Uninspected Vessels [2] [6]
Column 1	Column 2	Column 3	Column 4	Column 5	Column 6
Motor	Vessels of not over 15 gross tons.	All vessels carrying combustible or flammable liquid cargo in bulk.	All vessels carrying more than 6 passengers.[7]	Those vessels carrying dangerous cargoes when required by 46 CFR Part 98 or 146.	All vessels except those covered by columns 3, 4, and 5.
	Vessels over 15 gross tons except seagoing motor vessels of 300 gross tons and over.	All vessels carrying combustible or flammable liquid cargo in bulk.[8]	1. All vessels carrying more than 12 passengers on an international voyage, except yachts. 2. All vessels not over 65 feet in length which carry more than 6 passengers.[7] 3. All other vessels of over 65 feet in length carrying passengers for hire except documented cargo or tank vessels issued a permit to carry not more than 16 persons in addition to the crew.	All vessels carrying freight for hire except those covered by columns 3 and 4.	All vessels except those covered by columns 3, 4, and 5.
	Seagoing motor vessels of 300 gross tons and over.	All vessels carrying combustible or flammable liquid cargo in bulk.[8]	1. All vessels carrying more than 12 passengers on an international voyage, except yachts. 2. All other vessels carrying passengers, except: a. Yachts. b. Documented cargo or tank vessels issued a permit to carry not more than 16 persons in addition to the crew.	All vessels except those covered by columns 3 and 4, and those engaged in the fishing, oystering, clamming, crabbing, or any other branch of the fishery, kelp, or sponge industry.	All vessels except those covered by columns 3, 4, and 5.
Sail	Vessels not over 700 gross tons.	All vessels carrying combustible or flammable liquid cargo in bulk.	All vessels carrying more than 6 passengers.[7]	Those vessels carrying dangerous cargoes when required by 46 CFR Part 98 or 146.	None.
	Vessels over 700 gross tons.	All vessels carrying combustible or flammable liquid cargo in bulk.	All vessels carrying passengers for hire.	Those vessels carrying dangerous cargoes when required by 46 CFR Part 98 or 146.	None.
Nonself-propelled	Vessels not over 100 gross tons.	All vessels carrying combustible or flammable liquid cargo in bulk.	All vessels carrying more than 6 passengers.[7]	Those vessels carrying dangerous cargoes when required by 46 CFR Part 98 or 146.	All barges carrying passengers except those covered by column 4.
	Vessels over 100 gross tons.	All vessels carrying combustible or flammable liquid cargo in bulk.	All vessels carrying passengers for hire.	All seagoing barges except those covered by columns 3 and 4; and those inland barges carrying dangerous cargoes when required by 46 CFR Part 98 or 146.	All barges carrying passengers except those covered by column 4.

[1] Where length is used in this table it means the length measured from end to end over the deck, excluding sheer. This expression "means a straight line measurement of the overall length from the foremost part of the vessel to the aftermost part of the vessel, measured parallel to the centerline."

[2] Subchapters E (Load Lines), F (Marine Engineering), J (Electrical Engineering), and N (Dangerous Cargoes), of this chapter may also be applicable under certain conditions.

[3] Public nautical schoolships, other than vessels of the Navy and Coast Guard, shall meet the requirements of Part 167 of Subchapter R (Nautical Schools) of this chapter. Civilian nautical schoolships, as defined by 46 U.S.C. 1331, shall meet the requirements of Subchapter H (Passenger Vessels) and Part 168 of Subchapter R (Nautical Schools) of this chapter.

[4] Subchapter H (Passenger Vessels) of this chapter covers only those vessels of 100 gross tons or more. Subchapter T (Small Passenger Vessels) of this chapter covers only those vessels of less than 100 gross tons.

[5] Vessels covered by Subchapters H (Passenger Vessels) or I (Cargo and Miscellaneous Vessels) of this chapter, where the principal purpose or use of the vessel is not for the carriage of liquid cargo, may be granted a permit to carry a limited amount of flammable or combustible liquid cargo in bulk. The portion of the vessel used for the carriage of the flammable or combustible liquid cargo shall meet the requirements of Subchapter D (Tank Vessels) in addition to the requirements of Subchapter H (Passenger Vessels) or I (Cargo and Miscellaneous Vessels) of this chapter.

[6] Any vessel on an international voyage is subject to the requirements of the International Convention for Safety of Life at Sea, 1960.

[7] The meaning of the term "passenger" is as defined in the Act of May 10, 1956 (sec. 1, 70 Stat. 151; 46 U.S.C. 390).

[8] Boilers and machinery are subject to examination on vessels over 40 feet in length.

(e) This subchapter shall be applicable to all foreign flag vessels carrying combustible or flammable liquid cargo in bulk while in the navigable waters over which the United States has jurisdiction, except that:

(1) A vessel of a foreign nation signatory to the International Convention for Safety Of Life At Sea, 1960, which has on board a current valid Safety Equipment Certificate; or a vessel of a foreign nation having inspection laws approximating those of the United States, together with reciprocal inspection arrangements with the United States and which has on board a current valid Certificate of Inspection issued by its government under such arrangements; in either case, shall be subject only to the requirements of § 35.01-1 of Subpart 35.01, and the safety and cargo handling requirements in Subparts 35.30 and 35.35.

(f) Notwithstanding the exceptions previously noted in paragraph (e) of this section, foreign vessels of novel design or construction, or whose operation involves potential unusual risks, shall be subject to inspection to the extent necessary to safeguard life and property in United States ports, as further provided by § 2.01-13 of Subchapter A (Procedures applicable to the Public) of this chapter.

§ 30.01-6 Application of regulations to tankships on an international voyage—T/ALL.

(a) Where, in various places or portions of this subchapter, requirements are stipulated specifically for "tankships on an international voyage," it is intended that these requirements apply only to tankships subject to the International Convention for Safety of Life at Sea, 1960, which are mechanically propelled tankships of 500 gross tons and over on an international voyage, as defined in § 30.10-36.

(b) In accordance with Regulation 4, Chapter I (General Provisions), of the International Convention for Safety of Life at Sea, 1960, a tankship which is not normally engaged on an international voyage but which in exceptional circumstances, is required to undertake a single international voyage, may be exempted by the Commandant from any of the requirements of the regulations of this Convention: *Provided*, That it complies with safety requirements which are

adequate, in his opinion, for the voyage which is to be undertaken.

(c) In accordance with Regulation 1(c), Chapter II (Construction), of the International Convention for Safety of Life at Sea, 1960, the Commandant may, if he considers that the sheltered nature and conditions of the voyage are such as to render the application of any specific requirements of Chapter II of this Convention unreasonable or unnecessary, exempt from those requirements individual tankships or classes of tankships, which in the course of their voyage do not proceed more than 20 miles from the nearest land.

(d) In accordance with Regulation 3(a), Chapter III (Lifesaving Appliances, etc.), of the International Convention for Safety of Life at Sea, 1960, the Commandant, if he considers that the sheltered nature and conditions of the voyage are such as to render the application of the full requirements of Chapter III of this Convention unreasonable or unnecessary, may to that extent exempt from the requirements of Chapter III individual tankships or classes of tankships which, in the course of their voyage, do not go more than 20 miles from the nearest land.

§ 30.01–7 Ocean or unlimited coastwise vessels on inland and Great Lakes Routes—TB/OC.

(a) Vessels inspected and certificated for ocean or unlimited coastwise routes shall be considered suitable for navigation insofar as the provisions of this subchapter are concerned on any inland route, including the Great Lakes.

§ 30.01–10 Application of regulations governing alterations or repairs—TB/ALL.

When major alterations or major repairs of tank vessels become necessary the work shall be done under the direction of the Officer in Charge, Marine Inspection, and shall be in accordance with the regulations in effect for new construction insofar as possible. When minor alterations or minor repairs of tank vessels become necessary such work shall be under the direction of the Officer in Charge, Marine Inspection, and shall be in accordance with the regulations in effect at the time the vessel was contracted for or built, or in accordance with the regulations in effect for new construction insofar as possible.

§ 30.01–15 Effective date of regulations—TB/ALL.

(a) The regulations in this subchapter are effective on and after November 10, 1936: *Provided*, That amendments, revisions, or additions shall become effective ninety (90) days after the date of publication in the FEDERAL REGISTER unless the Commandant shall fix a different time.

(b) The regulations in this subchapter are not retroactive in effect unless specifically made so at the time the regulations are issued. Changes in specification requirements of articles of equipment, or materials used in construction of tank vessels, shall not apply to such items which have been passed as satisfactory until replacement shall become necessary, unless a specific finding is made that such equipment or material used is unsafe or hazardous and has to be removed from tank vessels.

§ 30.01–20 Portable containers—interpretive rulings—TB/ALL.

(a) The phrase "drums, barrels, or other packages," as used in R.S. 4417a, as amended (46 U.S.C. 391a), and in R.S. 4472, as amended (46 U.S.C. 170), is interpreted to mean portable containers having a maximum capacity of 110 U.S. gallons and ICC specification cylinders having a water capacity of not more than 1,000 pounds, which are actually loaded and discharged from vessels with their contents intact.

(b) The phrase "inflammable or combustible liquid cargo in bulk" as used in R.S. 4417a, as amended (46 U.S.C. 391a), and in R.S. 4472, as amended (46 U.S.C. 170), is interpreted to include such cargo in portable containers of a capacity of more than 110 U.S. gallons.

(c) The phrase "liquid cargo" as used in R.S. 4417a, as amended (46 U.S.C. 391a), is interpreted to mean flammable or combustible liquids.

(Interpret or apply R.S. 4472, as amended; 46 U.S.C. 170)

Subpart 30.10—Definitions

§ 30.10–1 Definition of terms—TB/ALL.

Certain terms used in the regulations in this subchapter are defined in this subpart.

§ 30.10–3 Approved—TB/ALL.

The term "approved" means approved by the Commandant unless otherwise stated.

§ 30.10–5 Cargo—TB/ALL.

The term "cargo" means combustible liquid, flammable liquid, or liquefied flammable gas unless otherwise stated.

§ 30.10–7 Certificated—TB/ALL.

The term "certificated" when applied to tank vessels refers to a vessel covered by a certificate of inspection issued by the Coast Guard; when applied to men employed on tank vessels, the term refers to a certificate of ability issued by the Coast Guard.

§ 30.10–9 Classification requirements—TB/ALL.

The term "classification requirements" means applicable rules and supplementary requirements of the American Bureau of Shipping, or other recognized classification society.

§ 30.10–11 Coastwise—TB/C.

Under this designation shall be included all tank vessels normally navigating the waters of any ocean or the Gulf of Mexico 20 nautical miles or less offshore.

§ 30.10–13 Cofferdam—TB/ALL.

The term "cofferdam" means a void or empty space separating two or more compartments for the purpose of isolation or to prevent the contents of one compartment from entering another in the event of the failure of the walls of one to retain their tightness.

§ 30.10–15 Combustible liquid—TB/ALL.

The term "combustible liquid" means any liquid having a flashpoint above 80° F. (as determined from an open-cup tester, as used for test of burning oils). Combustible liquids having lethal qualities are those having the characteristics of class "B" or "C" poisons as defined in §§ 146.25–10 and 146.25–15 of Subchapter N (Dangerous Cargoes) of this chapter. In the regulations of this subchapter, combustible liquids are referred to by grades, as follows:

(a) *Grade D.* Any combustible liquid having a flashpoint below 150° F. and above 80° F.

(b) *Grade E.* Any combustible liquid having a flashpoint of 150° F. or above.

§ 30.10–17 Commandant—TB/ALL.

The term "Commandant" means the Commandant of the Coast Guard.

§ 30.10–19 Coast Guard District Commander—TB/ALL.

The term "Coast Guard District Commander" means an officer of the Coast Guard designated as such by the Commandant to command all Coast Guard activities within his district which include the enforcement and administration of Title 52, R.S., acts amendatory thereof or supplemental thereto, rules and regulations thereunder and the inspections required thereby.

§ 30.10–21 Flammable or inflammable—TB/ALL.

The words "flammable" and "inflammable" are interchangeable or synonymous terms for the purpose of the regulations in this subchapter.

§ 30.10–22 Flammable liquid—TB/ALL.

The term "flammable liquid" means any liquid which gives off flammable vapors (as determined by flashpoint from an open-cup tester, as used for test of burning oils) at or below a temperature of 80° F. Flammable liquids having lethal qualities are those having the characteristics of class "B" or "C" poisons as defined in §§ 146.25–10 and 146.25–15, of Subchapter N (Dangerous Cargoes) of this chapter. Flammable liquids are referred to by grades as follows:

(a) *Grade A.* Any flammable liquid having a Reid[1] vapor pressure of 14 pounds or more.

(b) *Grade B.* Any flammable liquid having a Reid vapor pressure under 14 pounds and over 8½ pounds.

(c) *Grade C.* Any flammable liquid having a Reid[1] vapor pressure of 8½ pounds or less and a flashpoint of 80° F. or below.

[1] American Society for Testing Materials Standard D–323 (most recent revision), Method of Test for Vapor Pressure of Petroleum Products (Reid Method).

§ 30.10–23 Flame arrester—TB/ALL.

The term "flame arrester" means any device or assembly of a cellular, tubular, pressure, or other type used for preventing the passage of flames into enclosed spaces.

§ 30.10–25 Flame screen—TB/ALL.

The term "flame screen" means a fitted single screen of corrosion-resistant wire of at least 30 by 30 mesh, or two fitted screens, both of corrosion-resistant wire, of at least 20 by 20 mesh, spaced not less than ½ inch or more than 1½ inches apart.

§ 30.10–27 Flashpoint—TB/ALL.

The term "flashpoint" indicates the temperature in degrees Fahrenheit at which a liquid gives off a flammable vapor when heated in an open-cup tester. For the purpose of the regulations in this subchapter, flashpoints determined by other testing methods will be equivalent to those determined with an open-cup tester, as follows:

TABLE 30.10-27—EQUIVALENT FLASHPOINTS

Open-cup tester	Tag closed-cup tester (A. S. T. M.)	Pensky-Martens closed tester (A. S. T. M.)
°F.	°F.	°F.
80	75	----------
150	----------	140

§ 30.10–29 Gas free—TB/ALL.

The term "gas free" means free from dangerous concentrations of flammable or toxic gases.

§ 30.10–31 General rules and regulations—TB/ALL.

The term "general rules and regulations" means the requirements contained in this chapter.

§ 30.10–33 Great Lakes—TB/L.

Under this designation shall be included all tank vessels navigating the Great Lakes.

§ 30.10–35 Headquarters—TB/ALL.

The term "Headquarters" means the Office of the Commandant, U.S. Coast Guard, Washington, D.C., 20226.

§ 30.10–36 International voyage—TB/ALL.

(a) The term "international voyage," as used in this subchapter, shall have the same meaning as that contained in Regulation 2(d), Chapter I, of the International Convention for Safety of Life at Sea, 1960; i.e., " 'International voyage' means a voyage from a country to which the present Convention applies to a port outside such country, or conversely; and for this purpose every territory for the international relations of which a Contracting Government is responsible or for which the United Nations is the administering authority is regarded as a separate country."

(b) The International Convention for Safety of Life at Sea, 1960, does not apply to tank vessels "solely navigating the Great Lakes of North America and the River St. Lawrence as far east as a straight line drawn from Cap de Rosiers to West Point, Anticosti Island and, on the north side of Anticosti Island, the 63d Meridian." Accordingly, such tank vessels shall not be considered as being on an "international voyage" for the purposes of this subchapter.

(c) For the purposes of this subchapter the term "territory" as used in paragraph (a) of this section shall be considered to include the Commonwealth of Puerto Rico, the Canal Zone, all possessions of the United States, and all lands held by the United States under a protectorate or mandate.

(d) Although voyages between the continental United States and Hawaii or Alaska, and voyages between Hawaii and Alaska are not "international voyages" under the provisions of the International Convention for Safety of Life at Sea, 1960, such voyages are similar in nature and shall be considered as "international voyages" and subject to the same requirements for the purposes of this subchapter.

§ 30.10–39 Liquefied flammable gas—TB/ALL.

The term "liquefied flammable gas" means any flammable gas having a Reid vapor pressure exceeding 40 pounds which has been compressed and liquefied for the purpose of transportation.

§ 30.10–41 Lakes, bays, and sounds—TB/B.

Under this designation shall be included all tank vessels navigating the waters of any of the lakes, bays, or sounds other than the waters of the Great Lakes.

§ 30.10–43 Marine inspector or inspector—TB/ALL.

The terms "marine inspector" or "inspector" mean any person from the civilian or military branch of the Coast Guard assigned under the superintendence and direction of an Officer in Charge, Marine Inspection, or any other person as may be designated for the performance of duties with respect to the enforcement and administration of Title 52, R.S., acts amendatory thereof or supplemental thereto, rules and regulations thereunder, and the inspections required thereby.

§ 30.10–44 Nuclear vessel—TB/ALL.

A nuclear vessel is a vessel provided with a nuclear powerplant for propulsion or any other purpose, or any vessel handling or processing substantial amounts of radioactive material other than as cargo.

§ 30.10–45 Ocean—TB/O.

Under this designation shall be included all tank vessels normally navigating the waters of any ocean or the Gulf of Mexico more than 20 nautical miles offshore.

§ 30.10–47 Officer in Charge, Marine Inspection—TB/ALL.

The term "Officer in Charge, Marine Inspection," means any person from the civilian or military branch of the Coast Guard designated as such by the Commandant and who under the superintendence and direction of the Coast Guard District Commander is in charge of an inspection zone for the performance of duties with respect to the enforcement and administration of Title 52, R.S., acts amendatory thereof or supplemental thereto, rules and regulations thereunder and the inspections required thereby.

§ 30.10–49 Permit—TB/ALL.

The term "permit" refers to endorsement on the certificate of inspection, authorizing the presence on board of liquid flammable or combustible cargoes in bulk, issued by an Officer in Charge, Marine Inspection, for a tank vessel which is found to be in substantial compliance with the regulations in this subchapter.

§ 30.10–55 Pressure vacuum relief valve—TB/ALL.

The term "pressure vacuum relief valve" means any device or assembly of a mechanical, liquid, weight, or other type used for the automatic regulation of pressure or vacuum in enclosed places.

§ 30.10–57 Recognized classification society—TB/ALL.

The term "recognized classification society" means the American Bureau of Shipping or other classification society recognized by the Commandant.

§ 30.10–59 Reid vapor pressure—TB/ALL.

The term "Reid vapor pressure" means the vapor pressure of a liquid at a temperature of 100° F., expressed in pounds per square inch absolute, as determined by the "Reid Method" as described in the American Society for Testing Materials Standard D–323 (most recent revision), Method of Test for Vapor Pressure of Petroleum Products. This Standard is available at Headquarters for reading purposes or it may be purchased from the Society at 1916 Race Street, Philadelphia, Pa., 19103.

§ 30.10–61 Rivers—TB/R.

Under this designation shall be included all tank vessels whose navigation is restricted to rivers and/or to canals, exclusively.

§ 30.10–62 Rules of the Road—TB/ALL.

(a) The term "Rules of the Road" means the statutory and regulatory rules governing navigation of vessels. These rules are also published by the Coast Guard in pamphlet form as follows:

(1) Rules of the Road—International—Inland (CG–169).

(2) Rules of the Road—Great Lakes (CG–172).

(3) Rules of the Road—Western Rivers (CG–184).

(b) The current editions of the "Rules of the Road" pamphlets may be obtained from any Marine Inspection Office.

§ 30.10–63 Spark arrester—TB/ALL.

The term "spark arrester" means any device, assembly, or method of a mechanical, centrifugal, cooling, or other type

and of a size suitable for the retention or quenching of sparks in exhaust pipes from internal combustion engines.

§ 30.10–65 Tank barge—B/ALL.

The term "tank barge" means any tank vessel not equipped with means of self-propulsion.

§ 30.10–67 Tankship—T/ALL.

The term "tankship" means any tank vessel propelled by power or sail.

§ 30.10–69 Tank vessel—TB/ALL.

The term "tank vessel" means any vessel especially constructed or converted to carry liquid bulk cargo in tanks.

§ 30.10–71 Tankerman—TB/ALL.

The term "tankerman" means any person holding a certificate issued by the Coast Guard attesting to his competency in the handling of flammable or combustible liquid cargo in bulk or is any person holding a valid license as master, mate, pilot, or engineer.

Subpart 30.15—Equivalents

§ 30.15–1 Conditions under which equivalents may be used—TB/ALL.

(a) Where in this subchapter it is provided that a particular fitting, material, appliance, apparatus, or equipment, or type thereof, shall be fitted or carried in a vessel, or that any particular provision shall be made or arrangement shall be adopted, the Commandant may accept in substitution therefor any other fitting, material, apparatus, or equipment, or type thereof, or any other arrangement: *Provided*, That he shall have been satisfied by suitable trials that the fitting, material, appliance, apparatus, or equipment, or type thereof, or the provision or arrangement is at least as effective as that specified in this subchapter.

(b) In any case where it is shown to the satisfaction of the Commandant that the use of any particular equipment, apparatus, or arrangement not specifically required by law is unreasonable or impracticable, the Commandant may permit the use of alternate equipment, apparatus, or arrangement to such an extent and upon such conditions as will insure, to his satisfaction, a degree of safety consistent with the minimum standards set forth in this subchapter.

Subpart 30.20—Enforcement and Rights of Appeal

§ 30.20–1 Enforcement—TB/ALL.

The Officer in Charge, Marine Inspection, under the superintendence of the Coast Guard District Commander, is responsible for the performance of duties within his jurisdiction with respect to the enforcement and administration of Title 52, R. S., acts amendatory thereof or supplemental thereto, rules and regulations thereunder, and the inspections required thereby.

§ 30.20–10 Penalties for violations of tank vessel regulations—TB/ALL.

(a) The provisions of R.S. 4417a, as amended (46 U.S.C. 391a) provide the following penalty:

(7) The owner, master, or person in charge of any vessel subject to the provisions in this section, or any or all of them, who shall violate the provisions of this section, or of the rules and regulations established hereunder, shall be subject to a fine of not more than $1,000 or imprisonment for not more than one year, or both such fine and penalty.

(b) Certificates of inspection for tank vessels may also be revoked or suspended by the Coast Guard where such process is authorized by law. This may occur if the vessel does not meet the requirements of law or regulations in this chapter or if there is a failure to maintain the safety requirements requisite to the issuance of a certificate of inspection.

§ 30.20–50 Right of appeal—TB/ALL.

Whenever any person directly interested in or affected by any decision or action of any Officer in Charge, Marine Inspection, shall feel aggrieved by such decision or action, he may appeal therefrom to the Coast Guard District Commander having jurisdiction and a like appeal shall be allowed from any decision or action of the Coast Guard District Commander to the Commandant, whose decision shall be final: *Provided, however*, That application for such reexamination of the case by a Coast Guard District Commander or by the Commandant shall be made within 30 days after the decision or action appealed from shall have been rendered or taken.

(R.S. 4453, as amended; 46 U.S.C. 435)

PART 31—INSPECTION AND CERTIFICATION

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AUTHORITY: The provisions of this Part 31 issued under R.S. 4405, as amended, 4417a, as amended, 4462, as amended; 46 U.S.C. 375, 391a, 416. Interpret or apply sec. 3, 68 Stat. 675; 50 U.S.C. 198; E.O. 11239, July 31, 1965, 30 F.R. 9671, 3 CFR, 1965 Supp. Treasury Department Orders 120, July 31, 1950, 15 F.R. 6521; 167-14, Nov. 26, 1954, 19 F.R. 8026, unless otherwise noted.

Subpart 31.01—General

§ 31.01-1 Inspections required—TB/ALL.

(a) Every tank vessel subject to the regulations in this subchapter shall be inspected biennially, or annually, or oftener, if necessary, by the Coast Guard to see that the hull, boilers, machinery, equipment, apparatus for storage, and appliances of the vessel comply with the marine inspection laws, and the regulations in this subchapter, and Subchapter E (Load Lines), Subchapter F (Marine Engineering), Subchapter J (Electrical Engineering), and Subchapter Q (Specifications) of this chapter where applicable.

(b) Tank vessels while laid up and dismantled and out of commission are exempt from any or all inspections required by law or regulations in this subchapter.

(c) For inspection and tests of tanks containing certain dangerous cargoes in bulk, see Part 98 of Subchapter I (Cargo and Miscellaneous Vessels) of this chapter.

(R.S. 4418, as amended, 4433, as amended, 4472, as amended, 4488, as amended; 46 U.S.C. 392, 411, 170, 481. Treasury Department Orders CGFR 56-28, July 24, 1956, 21 F.R. 5659; 167-38, Oct. 26, 1959, 24 F.R. 8857)

§ 31.01-5 Scope of initial inspection—TB/ALL.

(a) The initial inspection, which may consist of a series of inspections during the construction of a vessel, shall include a complete inspection of the structure, machinery, and equipment, including the outside of the vessel's bottom, and the inside and outside of the boilers. The inspection shall be such as to insure that the arrangements, materials, and scantlings of the structure, boilers and other pressure vessels and their appurtenances, piping, main and auxiliary machinery, electrical installations, lifesaving appliances, fire-detecting and extinguishing equipment, pilot ladders and other equipment fully comply with the applicable regulations for such vessel and are in accordance with approved plans, and that the radio installations, including fixed and portable radios for lifeboats, are in accordance with the requirements of the Federal Communications Commission. The inspection shall also be such as to insure that the workmanship of all parts of the vessel and its equipment is in all respects satisfactory and that the vessel is provided with lights, means of making sound signals and distress signals as required by applicable regulations and the applicable Rules of the Road.

(b) For nuclear vessels, the foregoing inspection shall be made except insofar as they may be limited by the presence of radiation. In addition, the inspection shall include any special requirements of the vessel's "Safety Assessment."

§ 31.01-10 Authority of marine inspectors—TB/ALL.

Inspectors may at any time lawfully inspect any tank vessel.

§ 31.01-15 Application for inspection—TB/ALL.

(a) Application in writing for the inspection incident to the issuance or reissuance of a certificate of inspection to every tank vessel required to be inspected by law and the regulations in this subchapter shall be made by the master, owner, or agent to the Officer in Charge, Marine Inspection, at any local marine inspection office, U.S. Coast Guard, where the vessel may be operated.

(b) The application should be on Form CG-3752, Application for Inspection of U.S. Vessel, which requires information on name and type of vessel, nature of employment and route in which to be operated, grade or type of cargo to be carried, place where and date when the vessel may be inspected, and that no other application has been made to any Officer in Charge, Marine Inspection, since the issuance of the last valid certificate of inspection.

§ 31.01-20 Application for inspection of new tank vessel or conversion of a vessel to a tank vessel—TB/ALL.

Prior to the commencement of the construction of any new tank vessel, or prior to the commencement of the conversion of any vessel to a tank vessel, application for the approval of contract plans and specifications and for a certificate of inspection shall be made in writing to the Coast Guard and no such construction or conversion shall be proceeded with until such approval is granted. (See § 31.10-1.)

Subpart 31.05—Certificates of Inspection

§ 31.05-1 Issuance of certificate of inspection—TB/ALL.

(a) When a tank vessel is found to comply with law and the regulations in this subchapter, and Subchapter E (Load Lines), Subchapter F (Marine Engineering), Subchapter J (Electrical Engineering), and Subchapter Q (Specifications) of this chapter, a certificate of inspection shall be issued to it, or to its owners, by the Officer in Charge, Marine Inspection.

(b) Certificates of inspection for tank vessels shall be similar in form to certificates issued to other cargo vessels, and in addition to the manning requirements and waters over which they may be operated, they shall be appropriately endorsed "Inspected and approved for the carriage of flammable or combustible liquids of Grade A, B, C, D, or E" (as the case may be), and such endorsement shall serve as a permit for such vessel to operate. The endorsement for the carriage of liquefied flammable gases is set forth in § 38.01-5 of this subchapter. The endorsement for the carriage of Class "B" or "C" poisonous liquids is set forth in § 39.01-5 of this subchapter.

(c) The certificate of inspection shall be delivered to the master or owner of the tank vessel to which it relates.

§ 31.05-5 Posting the certificate of inspection—TB/ALL.

The certificate of inspection shall be framed under glass and posted in a conspicuous part of the vessel, except that where it is not practicable to so expose the certificate of inspection it shall be carried in the vessel in such manner as authorized by the Officer in Charge, Marine Inspection.

§ 31.05-10 Period covered by certificate of inspection—TB/ALL.

(a) Certificates of inspection will be issued for periods of either 1 or 2 years. For nuclear vessels, the period of validity shall be 1 year.

(b) Application may be made by the master, owner, or agent for inspection and issuance of a new certificate of inspection at any time during the period of validity of the current certificate. (See §§ 31.01-15 and 31.01-20.)

§ 31.05-15 Certificate of inspection; terms; endorsements—TB/ALL.

The terms, endorsements and conditions set forth on a certificate of inspection shall have the same force and effect as the regulations contained in this subchapter.

Subpart 31.10—Inspections

§ 31.10-1 Recognized classification society—TB/ALL.

(a) In the inspection of hulls, boilers, and machinery, the current standards established by the American Bureau of Shipping and designated "Rules for Building and Classing Steel Vessels" respecting material and construction of hulls, boilers, and machinery, except as otherwise provided for by law and regulations in this chapter, shall be accepted as standard by the Coast Guard.

(b) The current standards established by the American Bureau of Shipping in effect at the time of construction of the vessel, or otherwise as applicable, shall be used. The book "Rules for Building and Classing Steel Vessels" is usually published annually and may be purchased from the American Bureau of Shipping, 45 Broad Street, New York, N.Y., 10004. These standards may be also examined at the office of the Commandant (M), U. S. Coast Guard, Washington, D.C., 20236, or at the office of any Coast Guard District Commander or Officer in Charge, Marine Inspection.

(c) The approved plans and certificate of the American Bureau of Shipping, or other recognized classification society for classed vessels, may be accepted by the Coast Guard as evidence of the structural efficiency of the hull and reliability of machinery of vessels subject to the regulations in this subchapter, except as otherwise provided for by laws and regulations in this chapter.

§ 31.10–5 Inspection of new tank vessels—TB/ALL.

(a) *Plans.* Triplicate copies of contract plans and specifications shall be forwarded to the Officer in Charge, Marine Inspection, in whose district the construction will take place, for submission to Headquarters for approval, but if the tank vessel is to be classed, such plans and specifications shall first be approved by a recognized classification society. If the plans and specifications are found to be in substantial agreement with the regulations in this chapter, they shall be approved, properly stamped and dated and distributed as follows: one set to owner or builder; one set to Officer in Charge, Marine Inspection, of the district in which the vessel is to be built; and one set shall be retained at Headquarters. If such plans and specifications are not approved, Headquarters shall notify the owner or builder promptly wherein they fail to comply with the regulations in this chapter. For list of electrical plans see § 111.05–5 of Subchapter J (Electrical Engineering) of this chapter.

(1) The plans and specifications shall include the arrangement of the cargo gear. The principal details of the gear and the safe working load for each component part shall be shown. (See § 31.10–16 and Subpart 31.37 for applicable requirements.)

(b) *Inspection.* During construction, and upon completion of each tank vessel, it shall be inspected by the Officer in Charge, Marine Inspection, to determine whether it has been built in accordance with the approved plans and specifications, and, if so, a certificate of inspection endorsed as a permit for the carriage of flammable or combustible liquids in bulk for the proper grade or grades of cargo shall be issued to the vessel or its owner.

(c) *Certificate of class may be accepted.* In the event such tank vessel is classed by the American Bureau of Shipping or other recognized classification society, the approved plans and certificates of such society may be accepted by the Coast Guard as evidence of the structural efficiency of the hull and reliability of machinery, except as otherwise provided for by law and the rules and regulations in this subchapter.

§ 31.10–10 Vessels converted to tank vessels—TB/ALL.

The procedure for the inpection of vessels converted to tank vessels shall conform to the inspection for new tank vessels as called for in § 31.10–5(b), and such vessels shall comply with the requirements of inspections for converted vessels as set forth in the regulations in this subchapter.

§ 31.10–15 Inspection for certification—TB/ALL.

(a) The Officer in Charge, Marine Inspection, shall once in every 2 years, at least, and in the case of nuclear vessels, at least once every year carefully inspect such tank vessel within his jurisdiction and shall satisfy himself that every such vessel so inspected is of a structure suitable for the carriage of flammable and/or combustible liquids in bulk and for the proper grade or grades of such cargo in the service in which she is employed. If the Officer in Charge, Marine Inspection, deems it expedient, he may direct the vessel to be put in motion, and may adopt any other suitable means to test her sufficiency and that of her equipment.

(b) The inspection for certification shall include an inspection of the structure, boilers, and other pressure vessels, machinery and equipment. The inspection shall be such as to insure that the vessel, as regards the structure, boilers and other pressure vessels and their appurtenances, piping, main and auxiliary machinery, electrical installations, lifesaving appliances, fire-detecting and extinguishing equipment, pilot ladders, and other equipment is in satisfactory condition and fit for the service for which it is intended, and that it complies with the applicable regulations for such vessels, and that the radio installations, including fixed and portable radios for lifeboats, are in compliance with the requirements of the Federal Communications Commission. The lights and means of making sound signals and the distress signals carried by the vessel shall also be subject to the above mentioned inspection for certification for the purpose of insuring that they comply with the requirements of the applicable regulations and of the applicable Rules of the Road.

(c) For nuclear vessels, the foregoing inspections shall be made except insofar as they may be limited by the presence of radiation. In addition, the inspection shall include any special requirements of the vessel's "Safety Assessment."

§ 31.10–16 Inspection and certification of cargo gear—TB/ALL.

(a) An inspection of the cargo gear shall be required. The inspection may consist of tests and examinations to determine the condition and suitability of the cargo gear. Current valid certificates and registers of cargo gear, issued by recognized nonprofit organizations or associations approved by the Commandant may be accepted as prima facie evidence of the condition and suitability of the cargo gear. Cargo gear certificates and registers will not be issued by the Coast Guard.

(b) Every acceptable cargo gear certificate and/or register shall be properly executed by a person authorized to do so and shall:

(1) Certify as to the tests and examinations conducted;

(2) Show the dates on which the tests and examinations were conducted; and

(3) Indicate that the cargo gear therein described complies with standards equal to or exceeding those set forth in Subpart 31.37.

(c) Competent persons for the purposes of this section and Subpart 31.37 are:

(1) Coast Guard marine inspectors;

(2) Surveyors of the organizations or associations approved by the Commandant;

(3) Such other persons as are authorized by the regulations in Subpart 31.37 as may be required; and,

(4) Responsible officials or employees of the testing laboratories, companies, or organizations who conduct tests of pieces of loose cargo gear, wire rope, or the annealing of gear as may be required.

(d) The registers issued in connection with cargo gear certification must have all required entries fully completed as of the dates indicated, shall be kept current, and shall include the following:

(1) A register of the cargo handling machinery and the gear accessory thereto carried on the vessel named therein;

(2) Certification of the testing and examination of winches, derricks, and their accessory gear;

(3) Certification of the testing and examination of cranes, hoists, and their accessory gear;

(4) Certification of the testing and examination of chains, rings, hooks, shackles, swivels, and blocks;

(5) Certification of the testing and examination of wire rope;

(6) Certification of the heat treatment of chains, rings, hooks, shackles, and swivels which require such treatment; and,

(7) Certification of the annual thorough examinations of gear not required to be periodically heat treated.

(e) It is the responsibility of the master to have a ship's officer inspect cargo gear when required by Subpart 31.37. For those inspected vessels which do not have valid cargo gear certificates and registers as provided by this section, such vessels will be required to have their shipboard cargo gear undergo tests and inspections in accordance with the provisions of Subpart 31.37.

§ 31.10–17 Reinspection—TB/ALL.

(a) At least one reinspection shall be made on each vessel holding a certificate of inspection valid for two years. This reinspection will be made, where possible, between the tenth and fourteenth month of the period for which the certificate is valid. No written application for reinspection will be required.

(b) The inspector shall examine all accessible parts of the vessel's hull, machinery, and equipment to be assured that it is in a satisfactory condition.

(c) In general, the scope of the reinspection shall be the same as for the inspection for certification, but will be in less detail unless it is determined that a major change has occurred since the last inspection.

(d) Nothing in this subpart shall be construed as limiting the inspector from making such tests or inspections as he deems necessary to be assured of the seaworthiness of the vessel.

(e) If the reinspection reveals deficiencies in the maintenance as called for by the regulations in this subchapter, such necessary repairs or improvements shall be made as may be ordered.

§ 31.10-18 Firefighting equipment: General—TB/ALL.

(a) It shall be the duty of the owner, master, or person in charge of a tank vessel to require and have performed at least once in every 12 months, the tests and inspections of all hand portable fire extinguishers, semiportable fire extinguishing systems, and fixed fire extinguishing systems on board, as described in paragraphs (b), (c), and (d) of this section. The owner, master, or person in charge shall keep records of such tests and inspections showing the dates when performed, the number and/or other identification of each unit tested and inspected, and the name(s) of the person(s) and/or company conducting the tests and inspections. Such records shall be made available to the marine inspector upon request and shall be kept for the period of validity of the vessel's current certificate of inspection. Where practicable, these records should be kept in or with the vessel's logbook. The conduct of these tests and inspections does not relieve the owner, master, or person in charge of his responsibility to maintain this firefighting equipment in proper condition at all times.

(b) The following tests and inspections of portable fire extinguishing equipment shall be made:

TABLE 31.10-18(b)

Type unit	Test
Soda acid	Discharge. Clean hose and inside of extinguisher thoroughly. Recharge.
Foam	Discharge. Clean hose and inside of extinguisher thoroughly. Recharge.
Pump tank (water or antifreeze).	Discharge. Clean hose and inside of extinguisher thoroughly. Recharge with clean water or antifreeze.
Cartridge operated (water, antifreeze or loaded stream).	Examine pressure cartridge and replace if end is punctured or if cartridge is otherwise determined to have leaked or to be in unsuitable condition. Remove liquid, clean hose and inside of extinguisher thoroughly. Recharge with clean water, solution, or antifreeze. Insert charged cartridge.
Stored pressure (water, antifreeze or loaded stream).	See that pressure gage is in operating range. If not, or if seal is broken, weigh or otherwise determine that full charge is in extinguisher. Recharge if pressure is low or if extinguishing agent is needed.
Carbon dioxide	Weigh cylinders. Recharge if weight loss exceeds 10 percent of weight of charge. Inspect hose and nozzle to be sure they are clear.[1]
Dry chemical (cartridge-operated type).	Examine pressure cartridge and replace if end is punctured or if cartridge is otherwise determined to have leaked or to be in unsuitable condition. Inspect hose and nozzle to see if they are clear. Insert charged cartridge. Be sure dry chemical is freeflowing (not caked) and chamber contains full charge.
Dry chemical (stored pressure type).	See that pressure gage is in operating range. If not, or if seal is broken, weigh or otherwise determine that full charge of dry chemical is in extinguisher. Recharge if pressure is low or if dry chemical is needed.

See footnote at end of table.

TABLE 31.10-18(b)—Continued

Type unit	Test
Vaporizing liquid[2] (pump type).	Pump a few strokes into clean pail and replace liquid. Keep water out of extinguisher or liquid. Keep extinguisher completely full of liquid.
Vaporizing liquid[2] (stored pressure type).	See that pressure gage is in operating range. Weigh or check liquid level to determine that full charge of liquid is in extinguisher. Recharge if pressure is low or if liquid is needed.

[1] Cylinders shall be tested and marked in accordance with the regulations of the Interstate Commerce Commission, as noted in § 147.04-1 of Subchapter N (Dangerous Cargoes) of this chapter.

[2] Vaporizing-liquid type fire extinguishers containing carbon tetrachloride or chlorobromomethane or other toxic vaporizing liquids shall be removed from all vessels.

(c) The following tests and inspections of fixed fire extinguishing equipment shall be made:

TABLE 31.10-18(c)

Type system	Test
Foam	Systems utilizing a soda solution shall have such solution replaced. In all cases, ascertain that powder is not caked.
Carbon dioxide	Weigh cylinders. Recharge if weight loss exceeds 10 percent of weight of charge.[1]

[1] Cylinders shall be tested and marked in accordance with the regulations of the Interstate Commerce Commission, as noted in § 147.04-1 of Subchapter N (Dangerous Cargoes) of this chapter.

(d) Deck foam systems shall be tested biennially by discharging foam for approximately 15 seconds from any nozzle designated by the marine inspector. It shall not be required to deliver foam from all foam outlets, but all lines and nozzles shall be tested with water to prove them to be clear of obstruction. Prior to the biennial inspection of deck foam systems utilizing a mechanical foam system, a representative sample of the foam liquid shall be submitted to the manufacturer who will issue a certificate indicating gravity, pH, percentage of water dilution and solid content.

(e) At each inspection for certification and at such other times as considered necessary, the inspector shall determine that all fire extinguishing equipment is in suitable condition and that the tests and inspections required by paragraphs (b) through (i) of this section have been conducted. In addition, the marine inspector may require such tests as are considered necessary to determine the condition of the equipment.

(f) On all fire extinguishing systems, all the piping, controls, valves, and alarms shall be checked by the marine inspector to ascertain that the system is in good operating condition.

(g) The fire main system shall be operated and the pressure checked at the most remote and highest outlets by the marine inspector. All fire hose shall be subjected to a test pressure equivalent to the maximum pressure to which they may be subjected in service, but not less than 100 p.s.i. The marine inspector shall check that the hose couplings are securely fastened in accordance with the regulations of this subchapter.

(h) At each inspection for certification and at such other times as considered necessary, all carbon dioxide cylinders for fixed, semiportable, and portable systems shall be examined and replaced if any corrosion is found. They shall also be checked by weighing to determine their contents, and if found to be more than 10 percent under the required contents of carbon dioxide, they shall be recharged.

(i) Steam smothering lines shall be tested with at least 50 pounds per square inch of air pressure or by blowing steam through the lines at the working pressure and a survey made for detecting corrosion and defects using hammer test or such other means as may be necessary.

§ 31.10-19 All firefighting equipment may be tested—TB/ALL.

(a) During the inspection of firefighting equipment, the Officer in Charge, Marine Inspection, may require fire apparatus to be tested, and used, except as provided under §§ 31.10-18(h) and 34.15-90(a) of this subchapter.

§ 31.10-20 Drydocking or hauling out—TB/ALL.

(a) Except for extensions as authorized by the Commandant, each steel hull tank vessel shall be placed in a drydock or on a slipway or hauled out for examination within the periods set forth in this paragraph, depending upon the service.

(1) Each tank vessel shall be drydocked or hauled out at intervals not to exceed 18 months if it operates in salt water an aggregate of more than 9 months in the 18-month period since it was last drydocked or hauled out.

(2) Each tank vessel shall be drydocked or hauled out at intervals not to exceed 36 months if it operates in salt water an aggregate of more than 3 months but not more than 6 months in each 12-month period since it was last drydocked or hauled out. When a tank vessel exceeds this aggregate amount of service in salt water in any 12-month period since it was last drydocked or hauled out, it shall be drydocked or hauled out within 6 months after the end of that period or within the 36-month interval, whichever is earlier.

(3) Each tank vessel shall be drydocked or hauled out at intervals of 48 months if it operates in salt water an aggregate of more than one month but not more than 3 months in each 12-month period since it was last drydocked or hauled out.

(4) Each tank vessel shall be drydocked or hauled out at intervals not to exceed 60 months if it operates in salt water an aggregate not exceeding one month in each 12-month period since it was last drydocked or hauled out.

(5) Tank barges used in fresh water service exclusively need not be drydocked or hauled out during the first 60-month interval after date of build, but shall be drydocked or hauled out between that time and the end of the 120th month after date of build, and at least once in each 60-month interval thereafter.

(b) Each wood hull tank vessel shall be placed in drydock or on a slipway or hauled out for examination at intervals not to exceed 48 months.

(c) Each tank vessel, irrespective of service which has not complied with these drydocking requirements, either because it was on voyage or was tied up, shall be drydocked or hauled out upon the completion of such voyage or before being placed in service.

(d) Whenever any tank vessel is placed in drydock or on a slipway or hauled out for repairs it shall be the duty of the master, owner, or agent to report the same, together with the nature of any repairs or alterations contemplated, to the Officer in Charge, Marine Inspection, of that zone, and if the condition or age of the vessel, in the judgment of the inspectors, renders an examination necessary, a thorough inspection shall be made by them to determine what is necessary to make such vessel seaworthy and come within the provisions of the regulations in this subchapter.

(e) Sea chests, sea valves, sea strainers and bilge injection valves shall be examined at the time of the drydockings required by paragraphs (a), (b), and (c) of this section and shall be opened up for internal examination when deemed necessary by the Officer in Charge, Marine Inspection.

§ 31.10–23 Examination of tail shaft—T/OC.

The outboard shaft or shafts on every ocean or coastwise tankship shall be drawn for examination once at least in every 3 years: *Provided*, That if the circumstances warrant it, the Coast Guard District Commander may extend this time to the next regular drydocking period, not to exceed 4 months: *And provided further*, That when it is shown that a vessel has had a long period of lay-up, the Coast Guard District Commander may grant an extension equal to the time the vessel has been out of commission, but in no case shall the extension exceed 1 year.

§ 31.10–25 Inspection covering repairs and alterations involving safety—TB/ALL.

No extensive alterations involving the safety of a tank vessel either in regard to hull or machinery shall be made without the approval of the Commandant. Before such alterations are carried out, copies of plans and specifications in triplicate for the work involved shall be forwarded to the Officer in Charge, Marine Inspection, in whose zone the repairs will be made, for submission to Headquarters for approval. If approved one set of the plans and specifications, properly stamped and dated, shall be returned to the owner or to the repair yard designated by the owner; one set to the Officer in Charge, Marine Inspection, who forwarded the plans and specifications to Headquarters; and one set shall be retained at Headquarters. If such plans and specifications are not approved, the Commandant shall promptly notify the owner or designated shipyard wherein they fail to comply with the regulations in this chapter. No extensive repairs to the hull or machinery which affect the safety of a vessel shall be made without the knowledge of the Officer in Charge, Marine Inspection.

§ 31.10–30 Stability requirements—TB/ALL.

(a) *Application.* The provisions of this section shall apply to the following tank vessels:

(1) Any tankship of 500 gross tons and over on an international voyage, construction or conversion of which is started on or after November 19, 1952.

(2) Any other vessel whose stability is questioned by the Commandant or the Officer in Charge, Marine Inspection.

(b) *Stability test.* (1) The stability of each new tank vessel or class of vessels to which this section pertains shall be subject to review by the Commandant to determine whether or not a stability test is required. Where such a review involving a comparison with existing similar vessels, clearly indicates that due to the vessel's proportions and arrangements more than sufficient metacentric height will be available in all probable loading conditions, a stability test will not be required. Consistent with the foregoing principle, tank vessels will ordinarily not be required to be inclined if they have a molded beam in excess of 11 feet plus 1.5 times the molded depth, and further, if those vessels over 300 feet in length have two or more longitudinal bulkheads and those of 300 feet and less have at least one longitudinal bulkhead.

(2) The Commandant may allow the stability test of a tank vessel to be dispensed with provided basic stability data are available from the stability test of a sister vessel and it is shown to the satisfaction of the Commandant that reliable stability information for the exempted vessel can be obtained from such basic data.

(c) *Plans required.* (1) The following plans are essential for use in determining whether or not a stability test is to be required and should be made available as early as possible:

Lines plan.
Curves of form.
General arrangement plan of all decks and levels.
Inboard and outboard profile.
Midship section.

(2) If it is determined that a stability test is required, the following additional plans will be required:

Capacity plan showing capacities and vertical and longitudinal centers of gravity of all tanks and cargo spaces.
Tank sounding tables.
Draft mark locations.

(d) *Information supplied to master.* (1) Vessels which are exempted from a stability test in accordance with the provisions of subparagraph (b)(1) of this section will be provided with a stability letter recording this fact.

(2) Vessels for which a stability test is required or which are exempted from such a test in accordance with subparagraph (b)(2) of this section shall be provided with information, based upon the results of the applicable stability test, which is such that the master can, by rapid and simple process, obtain accurate guidance as to the stability of the vessel under varying conditions of service. Where special regard to particular operating conditions is necessary to assure safety of the vessel, full information relative thereto shall be included. The information required by this paragraph shall be submitted to the Commandant. Upon approval of this information, a stability letter recording this fact will be provided to the vessel.

(e) *Stability letter.* (1) Each tank vessel subject to the requirements of this section shall have posted under glass in the pilothouse a stability letter issued by the Coast Guard before the vessel is placed in service.

(2) Stability letters issued in accordance with subparagraph (d)(2) of this section will set forth the master's responsibility for maintaining satisfactory stability conditions at all times.

(f) *Alterations.* Where any alterations are made to a tank vessel so as to materially affect the stability information supplied to the master, amended stability information shall be provided. If necessary the vessel shall have a new stability test.

§ 31.10–35 Permit to proceed to another port for repair—TB/ALL.

(a) The Officer in Charge, Marine Inspection, may issue a permit to proceed to another port for repair, Form CG–948, to a vessel if in his judgment it can be done with safety even if the certificate of inspection of the vessel has expired or is about to expire.

(b) Such permit will only be issued upon the written application of the master, owner or agent of the vessel.

(c) The permit will state upon its face the conditions under which it is issued and whether or not the vessel is permitted to carry freight or passengers. Passengers may not be carried if the certificate of inspection has expired.

(d) The permit shall be carried in a manner similar to that described in § 31.05–5 for a certificate of inspection.

(R.S. 4453, as amended; 46 U.S.C. 435)

§ 31.10–40 Inspection during trial trip—T/ALL.

On the trial trip of each new or converted tankship, an inspector shall be present to observe from the standpoint of safety in the carriage of flammable and/or combustible liquids in bulk, the operation of boilers, engines, steering gear, and auxiliaries; and if not satisfied with the performance of such boilers and machinery, appliances, and apparatus for stowage, he shall make such requirements as in his judgment will overcome any deficiencies which may have come under his observation.

§ 31.10–45 Inspection of crew accommodations—TB/ALL.

Crew's quarters shall be inspected to determine their sanitary condition. The Officer in Charge, Marine Inspection, upon completing such inspection, shall notify the master or officer in charge of the vessel of his findings,

which shall be entered in the vessel's log book.

(Sec. 4, 49 Stat. 1935, as amended; 46 U.S.C. 660a)

§ 31.10–50 Inspection of bilges—TB/ALL.

(a) When inspecting oil-burning vessels, either internal-combustion type or steam-driven type, the marine inspector shall examine the tank tops and bilges in the fireroom and engineroom to see that there is no accumulation of oil which might create a fire hazard.

(Interpret or apply R.S. 4488, as amended, 46 U.S.C. 481)

Subpart 31.15—Manning of Tank Vessels

§ 31.15–1 Licenced officers and crews—TB/ALL.

(a) The Officer in Charge, Marine Inspection, who inspects the vessel, shall make in the certificate of inspection for each tank vessel an entry of such complement of officers and/or crew as required by law and regulations in this subchapter, and which in the judgment of the Officer in Charge, Marine Inspection, will be necessary for her safe operation. The complement may be changed from time to time by endorsement on such certificate by an Officer in Charge, Marine Inspection, by reason of change of conditions or employment.

(b) In all cases where a certificate of inspection does not require at least two licensed officers, the Officer in Charge, Marine Inspection, shall enter in the certificate of inspection issued to any manned tank vessel subject to the regulations in this subchapter the number of the crew required to be certificated as tankermen. If the total complement of a tank vessel is either one or two persons, only one such person need be a certificated tankerman. If the total complement exceeds two, only two such persons need be certificated tankermen.

(R.S. 4463, as amended, sec. 2, 40 Stat. 549, as amended; 46 U.S.C. 222, 223)

§ 31.15–5 Tank barges—B/ALL.

(a) Tank barges need not be manned unless in the judgment of the Officer in Charge, Marine Inspection, such manning is necessary for the protection of life and property and for the safe operation of the vessel: *Provided, however,* That towing vessels, while towing barges which are not required to be manned, shall carry in the regular complement of the towing vessel and shall have on board at all times while towing, at least one licensed officer or certificated tankerman.

(b) Where the bulk liquid cargo to be transported is covered by the requirements of § 35.01–55 of this subchapter, the person in charge of the towing vessel or barge shall be provided with, and have on board, the information card required by § 35.01–55.

§ 31.15–6 Tank barges carrying bulk cargoes having dangerous characteristics in addition to flammability or combustibility—B/ALL.

(a) For those tank barges carrying a bulk liquid cargo covered by the requirements of § 35.01–55 of this subchapter, at least one member of the crew of the barge required to be manned pursuant to § 31.15–5 shall be especially qualified in the handling of the specific cargo to be carried. The Officer in Charge, Marine Inspection, shall be furnished satisfactory documentary evidence that such person is trained in and capable of performing competently the necessary operations which relate to the carriage and transfer of such cargo.

(Interpret or apply R.S. 4488, as amended; 46 U.S.C. 481)

§ 31.15–10 Towing vessels may carry persons in addition to crew—B/LBR.

(a) Towing vessels engaged in towing tank barges on the Great Lakes, inland waters, or rivers, may be authorized by the Coast Guard District Commander of the district to carry on board such number of persons in addition to its crew as shall be deemed necessary to carry on the legitimate business of such towing vessel or barge, not exceeding, however, one person to every net ton of the towing vessel.

(b) A Coast Guard District Commander granting a license to a vessel engaged in towing to carry persons in addition to its crew shall notify the Officer in Charge, Marine Inspection, in whose jurisdiction the vessel receiving the permit is engaged, and the Officer in Charge, Marine Inspection, shall keep a record of the same.

(Sec. 1, 24 Stat. 129, as amended; 46 U.S.C. 458)

Subpart 31.20—Waters Operated Over

§ 31.20–1 Waters—TB/ALL.

The certificate of inspection shall show the waters over which the tank vessel is permitted to operate, such as: all waters; oceans; coastwise; Great Lakes; bays, sounds, and lakes other than the Great Lakes; rivers; or inland waters tributary to the Gulf of Mexico.

Subpart 31.25—Load Lines

§ 31.25–1 Load lines required—TB/OCL.

All tank vessels of 150 gross tons or over navigating the oceans, coastwise waters, and Great Lakes are subject to the regulations in Parts 43 to 45, inclusive, Subchapter E (Load Lines) of this chapter.

Subpart 31.30—Marine Engineering

§ 31.30–1 Marine engineering regulations and material specifications—TB/ALL.

(a) All tank vessels are subject to the regulations contained in Parts 50 to 61, inclusive, of Subchapter F (Marine Engineering) of this chapter, whenever applicable, except as such regulations are modified by the regulations in this subchapter for tank vessels.

(b) Nuclear vessels shall comply with the applicable requirements in Subpart 57.30 of Part 57 of Subchapter F (Marine Engineering) of this chapter. The regulations covering the transportation and handling of radioactive materials as cargo are contained in Part 146 of Subchapter N (Dangerous Cargoes) of this chapter.

(Sec. 2, 23 Stat. 118, as amended, secs. 2, 633, 63 Stat. 496, 545; 46 U.S.C. 2, 14 U.S.C. 2, 633. Interpret or apply R.S. 4472, as amended, sec. 14, 29 Stat. 690, as amended, 41 Stat. 305, as amended, sec. 1, 2, 49 Stat. 1544, as amended, 46 U.S.C. 170, 363, 367)

Subpart 31.35—Electrical Engineering

§ 31.35–1 Electrical installations, lighting and power equipment, batteries, etc.—TB/ALL.

All tank vessels are subject to the regulations contained in Subchapter J (Electrical Engineering) of this chapter except as such regulations are modified by the regulations in this subchapter for tank vessels.

§ 31.35–5 Communications; alarm systems, telephone and voice tube systems, engine telegraph systems, etc.—TB/ALL.

All tank vessels are subject to the regulations contained in Subchapter J (Electrical Engineering) of this chapter except as such regulations are modified by the regulations in this subchapter for tank vessels.

Subpart 31.37—Inspection of Cargo Gear

§ 31.37–1 When made—TB/ALL.

(a) The specific tests and examinations shall be made at the intervals stated in the regulations in this subpart.

(b) A thorough examination of the assembled gear shall be made at least once in every year.

(c) An inspection to determine the condition and suitability of shipboard cargo gear will be made by a marine inspector at each inspection for certification. Inspections may be made at such other times as considered necessary by the Officer in Charge, Marine Inspection.

(d) For vessels fitted with cargo gear, an initial inspection of the assembled units under proof loads shall be conducted, followed by a complete dismantling or disassembling of such gear and a thorough examination of the parts to ascertain its condition. Subsequent tests of the assembled units under proof loads, followed by a dismantling or disassembling of such gear and a thorough examination shall be made once every 4 years, or oftener if necessary.

§ 31.37–3 Definitions of terms and words used in this subpart—TB/ALL.

(a) *Cargo gear.* The term "cargo gear" includes masts, stays, booms, winches, cranes, elevators, conveyors, standing and running gear forming that part of the shipboard cargo gear used in connection with the loading or unloading of dry cargo. This term does not include the gear used for handling cargo hoses or ship stores' only.

(b) *Dismantling or disassembling of gear.* The "dismantling" or "disassembling" of gear contemplated is the taking apart of units of gear to the extent necessary to determine the suitability of such gear for continued service and as

may be specifically required to carry out the intent of a particular provision in this subpart. After proof load tests, the disassembling need not include the sheaves and pins of the blocks included in the test unless there appears to be evidence of deformation or failure.

(c) *Thorough examination.* The "thorough examination" contemplated is a visual examination, supplemented if necessary by other means such as by a hammer test or by a test with electronic or ultrasonic devices.

(d) *Ton.* The word "ton" means a ton of 2,240 pounds.

(e) *Safe working load.* The "safe working load" (SWL) contemplated is the load the gear is approved to lift, excluding the weight of the gear itself.

§ 31.37–5 Tests and examinations of shipboard cargo gear—TB/ALL.

(a) For vessels fitted with cargo gear and without valid cargo gear certificates and registers issued by organizations or associations recognized by the Coast Guard, inspections shall be made by those competent persons described in paragraph (c) (1) and (2) of § 31.10–16, to determine the condition and suitability of the shipboard cargo gear. For the initial and subsequent quadrennial inspections, all the cranes, winches, hoists, derrick booms, derrick and mast bands, and all parts used in loading or unloading cargo shall be assembled in units and such assembled units shall then be tested under proof loads. The proof loads shall be handled for various types of units as required by specific regulations in this subpart. After the proof load tests of the assembled units of gear have been made, such gear shall be disassembled or dismantled so as to permit them to be thoroughly examined. The sheaves and pins of the blocks included in these proof load tests need not be removed unless there appears to be evidence of deformation or failure.

(b) For vessels fitted with cargo gear and holding valid cargo gear certificates and registers issued by organizations or associations recognized by the Coast Guard, the marine inspectors may accept such certificates as prima facie evidence of compliance with the requirements in this subpart. If an Officer in Charge, Marine Inspection, is in doubt as to the condition and suitability of shipboard cargo gear for such a vessel, the tests and examinations, or such portions thereof as deemed necessary, provided for in this subpart will be required.

(c) If any part or portion of the gear fails or becomes defective during such tests, such defective equipment shall be satisfactorily repaired or replaced.

§ 31.37–15 Cargo gear plans required when plans are not approved by a classification society—TB/ALL.

(a) For a new vessel or a vessel applying for initial inspection, the following plans of cargo gear are required to be submitted in triplicate to the Officer in Charge, Marine Inspection, for approval:

(1) Plans showing a stress diagram with the principal details of the gear.

(2) Plans containing a diagram showing the arrangement of the assembled gear and indicating the safe working load for each component part.

(b) The safe working load on which the design of any component part of the cargo gear is to be based, shall be taken as the maximum resultant load upon the component part in the design conditions assumed. The safe working load of the assembly is the load the gear is approved to lift, excluding the weight of the gear itself.

(c) One approved copy of each set of cargo gear plans shall be retained on the vessel.

§ 31.37–20 Cargo gear plans approved by a classification society—TB/ALL.

(a) The plans required by § 31.37–15 (a) need not be submitted to the Officer in Charge, Marine Inspection, for approval if such plans are or have been approved by the American Bureau of Shipping or similar classification society recognized by the Commandant.

(b) One approved copy of each set of cargo gear plans shall be retained on the vessel.

§ 31.37–25 Factors of safety—TB/ALL.

(a) In the design of the cargo gear, the safety factors in Table 31.37–25(a)

TABLE 31.37–25(a)

Safe working loads for component parts	Safety factors based on—		
	Ultimate strength	Yield point	Breaking test load
All metal structural parts, except steel booms:			
When the working load of the assembled gear is 10 tons or less	[1] 5	----------	----------
When the working load of the assembled gear is 13 tons or over	[1] 4	----------	----------
Steel booms:			
When the working load of the assembled gear is 10 tons or less	----------	[1] 3	----------
When the working load of the assembled gear is 13 tons or over	----------	[1] 2½	----------
Wooden structural parts	5	----------	----------
Chains	4½	----------	----------
Wire rope:			
For working loads 10 tons or under	----------	----------	5
For working loads over 10 tons	----------	----------	4
Fiber rope:			
When intended for running rigging	7	----------	----------
When intended for fixed gear and vangs	5	----------	----------

[1] For working loads between 10 and 13 tons, intermediate values of safety factors may be used.

taken in association with suitable design assumptions for actual loading conditions, shall be used and regarded as minima.

(b) The Commandant will give consideration to the use of factors of safety differing from those given in Table 31.37–25(a) where special materials or cargo gear of special design are to be used.

§ 31.37–30 Loose gear certificates and tests—TB/ALL.

(a) (1) Evidence of compliance with the proof load test requirements in this section for all chains, rings, hooks, links, shackles, swivels, blocks, and any other loose gear whether accessory to a machine or not, but which is used as ship's cargo gear, shall be listed on an appropriate certificate.

(2) This evidence of test and the recording thereof is required only once with respect to each article of gear so long as each article is identified and the certificates required are available on the vessel.

(3) Proof loads applied to the articles of loose gear shall be as shown in Table 31.37–30(a)(3).

(b) All chains, rings, hooks, links, shackles, swivels, blocks and any other loose gear, whether accessory to a machine or not, but which are used or intended for use as ship's cargo gear, shall bear a mark or number by which each piece can be identified when listed on a loose gear certificate. The safe working load "SWL" shall be marked on all blocks.

(c) The loose gear certificate shall show the distinguishing number or mark applied to the article of gear; a description of the article of gear; the date when the test proof load was applied; and the safe working load. The forms for loose gear certificates shall be as prescribed by and acceptable to associations or organizations approved by the Commandant and shall be suitable for the purposes described in this section.

(d) After being tested, all of the gear shall be examined to ascertain whether any part has been damaged, permanently deformed by the test, or has other visible defects. The pins and sheaves of all tested blocks shall be removed for this purpose. If damaged during these tests, such gear shall be satisfactorily repaired or replaced.

TABLE 31.37–30(a)(3)

Article of gear	*Proof load*
Chains, rings, hooks, links, shackles, swivels	Twice the safe working load.
Single sheave block	Four times the safe working load.[1]
Multiple sheave block with safe working load up to and including 20 tons.	Twice the safe working load.
Multiple sheave block with safe working load over 20 tons up to and including 40 tons.	20 tons in excess of the safe working load.
Multiple sheave block over 40 tons	One and a half times the safe working load.
Chain fall blocks used with roller chains (pitched chains), and rings, hooks, shackles, or swivels permanently attached thereto.	Do.

[1] The proof load applied to the block is equivalent to twice the maximum resultant load on the eye or pin when lifting the safe working load attached to a rope which passes around the sheave of the block. The proof load is, therefore, equal to four times the safe working load or twice the safe working load when the load is attached directly to the block instead of a rope passing around the sheave.

(e) The required examinations as set forth in paragraph (d) of this section may be accomplished by mechanical, electrical or other means provided the method employed is equal in efficiency to the visual examination of disassembled gear.

§ 31.37–35 Test and certification of wire rope—TB/ALL.

(a) All wire rope used as shipboard cargo gear shall be able to withstand a breaking test load of at least five times the safe working load. In the case of gear with a lifting capacity of over 10 tons, the breaking test load of wire rope shall be at least four times the safe working load. All wire rope shall be identified and described in a wire rope certificate. Such certificate shall be furnished and attested to by the manufacturer or a testing agency and shall certify:

(1) The breaking test load of a sample of the wire rope, which should be at least five times the safe working load or at least four times the safe working load if part of gear with a lifting capacity of over 10 tons;

(2) The name and address of the manufacturer;

(3) The diameter of the rope in inches and/or fractions thereof;

(4) The number of strands and the number of wires in each strand;

(5) The quality of the wire (e.g., improved plow steel);

(6) The date of the test; and,

(7) The load at which the sample broke.

(b) The forms for the wire rope certificate shall be prescribed by and acceptable to associations or organizations approved by the Commandant and shall be suitable for the purposes described in this section.

(c) In addition to the manufacturers' or testing agencies' attestations, a sample of the wire rope may be tested to destruction if required by the marine inspector when a visual inspection indicates an apparent defective condition.

§ 31.37–40 Proof test of cargo gear as a unit—TB/ALL.

(a) Winches with their accessory gear, including the derricks and attachments, at least once in each four years, shall be tested as a unit with proof loads exceeding the safe working load as set forth in Table 31.37–40(a).

TABLE 31.37–40(a)

Safe working load of assembled gear	*Proof load*
Not exceeding 20 tons	25 percent in excess.
Over 20 tons but not exceeding 50 tons.	5 tons in excess.
Over 50 tons	10 percent in excess.

(b) The proof load applied to winches and their gear shall be lifted with the ship's normal tackle, including the winches, and with the boom at an angle which should not be greater than 15 degrees to the horizontal or to the lowest angle approved in association with the design, or when these angles are impracticable, to the lowest practicable angle. When the load has been lifted, it shall be swung as far as possible in both directions.

(1) Where electrical winches are fitted with electromagnetic brakes, or where electrohydraulic winches are fitted with electromagnetic or hydraulic brakes at the winch, mechanical brakes for manual operation will not be required, but if so fitted shall be in satisfactory operating condition.

(2) Current for electric winch operation during the test shall be taken from the ship's circuits. Shore current may be used if it passes through the ship's switchboard.

(c) Cranes and other hoisting machines with their accessory gear at least once in each four years, shall be tested, with a proof load which shall exceed the safe working load as set forth in Table 31.37–40(a).

(d) The proof load applied to cranes and hoists shall be lifted, topped, and swung (slewed) as far as possible in each direction. If the boom of the crane has a movable radius, it shall be tested with a proof load as set forth in this section at the maximum and minimum radii of the boom. In the case of hydraulic cranes whose capacity is limited by pressure, and with which it is not possible to lift a load 25 percent in excess of the safe working load, the greatest possible load in excess of the safe working load shall be used. These tests and the amounts of the loads shall be recorded.

(e) After satisfactory completion of the proof load testing of the cargo gear in accordance with paragraphs (a) through (d) of this section, the cargo gear and all component parts shall be given a thorough visual examination, supplemented as necessary by other means such as a hammer test or with electronic or ultrasonic devices, to determine if any of the parts were damaged, deformed, or otherwise rendered unsafe for further use. If found defective, such gear shall be replaced.

(1) When the test is being conducted for the first time on a vessel, accessory gear shall be dismantled or disassembled for examination after the test. The sheaves and pins of the blocks included in this test need not be removed unless there appears to be evidence of deformation or failure.

(2) For subsequent tests such parts of the machinery and gear shall be dismantled and/or disassembled after the test as necessary to determine its suitability for continued service.

(f) Appropriate means shall be provided to prevent the foot of the boom from being accidentally lifted from the socket during the test.

(g) Vessels whose cargo gear has been in use but are without the valid registers and certificates described in § 31.10–16 will be inspected for defective cargo gear. The gear shall then be tested and examined as prescribed in this section. If the movable weights for proof testing are not reasonably available, a spring or hydraulic scale certified for accuracy may be used. Whenever such scales are used, the proof load shall be applied with the boom swung out as far as possible in one direction and then in the other direction, and at such intermediate positions as may be indicated. At any position, the indicator of the scale must maintain a constant reading under the proof load for a period of five minutes.

(h) On all types of winches and cranes efficient means shall be provided to stop and hold the proof load in any position, and the efficiency of such means shall be demonstrated.

(i) Electric winches, electrohydraulic winches fitted with electromagnetic or hydraulic brakes at the winch, or cranes shall be equipped so that a failure of the electric power shall stop the motion and set the brakes without any action on the part of the operator.

(2) Current for electric winches and cranes operation during the tests shall be taken from the ship's circuits. Shore current may be used if it passes through the ship's switchboard.

§ 31.37–45 Marking of booms and cranes—TB/ALL.

(a) The safe working load (abbreviated "SWL") for the assembled gear shall be marked on the heel of each boom, with the minimum angle to the horizontal for which the gear is designed. These letters and figures shall be in contrasting colors to the background and at least one inch in height.

(b) Where booms are rated at varying capacities depending on the radii, tables indicating the maximum safe working loads for the various working angles of the boom and the maximum and minimum radii at which the boom may be safely used shall be conspicuously posted near the controls and visible to the operator when working the gear.

§ 31.37–50 Use of wire rope and chains—TB/ALL.

(a) An eye splice made in any wire rope used as cargo gear, with or without a thimble, shall have at least three tucks with whole strands and two tucks with one half of the wire cut from the tucking strand: *Provided*, That this requirement shall not preclude the use of any other form of splice or connection if it is as efficient as the splice specified.

(b) Single wire rope cargo falls, wire rope pendants, topping lifts and preventers shall consist of clear lengths without splices except at the working ends. Wire rope clips shall not be used to form eyes in the working ends of single wire rope cargo falls.

(c) Wire rope shall not be used for shipboard cargo gear if in any length of 8 diameters, the number of visible broken wires exceeds ten percent of the total number of wires in the rope, or if the rope shows other signs of excessive wear, corrosion, kinking, or defect.

(d) Hoisting or sling chains used for shipboard cargo gear shall not be used if a length of chain has been stretched more than five percent of the original length, or the chain has become unsafe through overloading or faulty heat treatment, or whenever other external defects are evident.

(e) Chains used for shipboard cargo gear shall not be shortened by knotting, bolting, or wiring the links. The use of chains having a knot or kink as shipboard cargo gear is prohibited.

§ 31.37–55 Annealing—TB/ALL.

(a) Chains, hooks, rings, links, shackles, and swivels of wrought iron used as cargo gear shall be annealed at the following intervals:

(1) Wrought iron chains and gear in general use and of one half inch or less, at least once in every six months.

(2) All other wrought iron chains and gear, including topping lift chains, in general use, at least once in every twelve months.

(b) The annealing shall be done in a suitable closed oven and not over an open fire. Wrought iron shall be annealed at a temperature of between 1100° and 1200° Fahrenheit for a period of between 30 and 60 minutes. After being annealed, the article shall be allowed to cool slowly and shall be then tested completely for defects.

(c) Heat treatment of the cargo gear shall be done only by reputable firms having suitable equipment and personnel trained for this purpose. A certificate attesting to the annealing shall be furnished for all gear so treated.

(d) The heat treatment of chains, hooks, rings, links, shackles, and swivels of materials other than wrought iron used as cargo gear, if required, shall be effected in accordance with the manufacturer's instructions.

§ 31.37–60 Additions to gear—TB/ALL.

(a) When articles of loose gear and/or wire rope conforming with the requirements in this subpart are added to installed gear, or used as replacements in such gear from time to time, a record shall be maintained on the vessel which shall identify each article and the certificate accompanying it.

§ 31.37–65 Alterations, renewals, or repairs of cargo gear—TB/ALL.

(a) Whenever important repairs, renewals, or alterations are indicated or intended for the masts, booms, and permanent fittings of the cargo gear, such repairs, renewals, or alterations shall be undertaken only after compliance with § 31.10–25.

(b) Tests and examinations of the repairs, renewals, or alterations will be in accordance with § 31.37–40.

(c) When welding is used to lengthen, alter, or repair chains, rings, hooks, links, shackles, or swivels, they shall be properly heat treated and shall, before being again put into use, be tested and examined in accordance with the provisions of § 31.37–30.

§ 31.37–70 Responsibility of ship's officer for inspection of cargo gear—TB/ALL.

(a) All wire rope, chains other than bridle chains attached to booms or masts, and all rings, hooks, links, shackles, swivels, and blocks used in loading or unloading shall be visually inspected by a ship's officer designated for that purpose by the master.

(b) These inspections by a ship's officer shall be made at frequent intervals, and in any event not less than once in each month.

(c) Immediately after such an inspection by a ship's officer notations of such an inspection shall be made in record form which shall be in or kept with the cargo gear register if carried. In addition, the same notations of inspections together with the dates shall be entered in the Official Logbook for those vessels required to carry this record, or such information shall be kept with the log records maintained on vessels not required to carry the Official Logbook. (See § 31.37–75 for entries required to be kept.)

§ 31.37–75 Records regarding cargo gear—TB/ALL.

(a) The cargo gear records described in this subpart shall be maintained on the vessel and shall be made available to Coast Guard officials upon request. These records shall be kept for the periods of time they are valid and, in addition, until the next Coast Guard inspection for certification of the vessel. The certificates of manufacturers and/or testing laboratories, companies, or organizations shall be maintained on the vessel so long as the gear described in such certificates is on board the vessel.

(b) The records of all the inspections of cargo gear made by the ship's officers in accordance with § 31.37–70 shall be maintained on the vessel for periods of time which agree with those periods as covered by the current Coast Guard certificate of inspection issued to the vessel. These records shall show the dates of inspections, identify articles inspected, the conditions observed, and the name of the officer performing the inspection.

(c) The records of all tests and examinations conducted by or under the supervision of surveyors of the organizations or associations approved by the Commandant shall be maintained on the vessel.

(d) The Coast Guard will not issue cargo gear certificates and/or registers. The Coast Guard's records of inspections, tests, and examinations of a particular vessel's cargo gear made by a marine inspector or conducted under the supervision of the Coast Guard will be maintained in the Office of the Officer in Charge, Marine Inspection, having jurisdiction over the vessel at the time such work was performed. The original certificates or certified copies of certificates of manufacturers and/or testing laboratories, companies, or organizations for loose cargo gear, wire rope, or the annealing of gear shall be maintained on the vessel.

§ 31.37–80 Advance notice that cargo gear testing is desired—TB/ALL.

(a) The owner, agent, or master of a vessel shall give an advance notice when it is desired that the tests and examinations of cargo gear be made by or under the supervision of the marine inspectors. This advance notice shall be given to the Officer in Charge, Marine Inspection, in whose marine inspection zone the vessel is available for such inspection and examination.

(b) For the initial inspection and examination of cargo gear by the Coast Guard, the advance notice shall be to the cognizant Officer in Charge, Marine Inspection, as early as possible and shall include sketches and/or drawings showing each unit of cargo gear, the identification of component parts and the safe working loads. Copies of original certificates of manufacturers and/or testing laboratories, companies, or organizations maintained on the vessel may be accepted by the cognizant Officer in Charge, Marine Inspection, when satisfied such certificates properly describe the qualities of the component parts of the gear in question.

§ 31.37–85 Responsibility for conducting required tests and examinations—TB/ALL.

(a) The vessel's owners and/or operators shall furnish and pay the expenses required in conducting the tests and examinations prescribed by the regulations in this subpart, including the supplying of all instruments, other equipment, and personnel including personnel supervision for performance of all work required.

(b) The Coast Guard's participation in these required tests and examinations shall be confined to witnessing required tests and examinations with the view to determining whether or not the gear is satisfactory for the purpose intended. In the event it is determined that the gear is defective or unable to meet the standards set forth in this subpart, such gear, or portions thereof, shall be replaced to the satisfaction of the Officer in Charge, Marine Inspection, having jurisdiction over the vessel.

Subpart 31.40—Certificates Under International Convention for Safety of Life At Sea, 1960

§ 31.40–1 Application—T/ALL.

(a) The provisions of this subpart, with the exception of §§ 31.40–30 and 31.40–40(e), shall apply to all tankships on an international voyage other than nuclear vessels.

(b) The provisions of §§ 31.40–30, 31.40–35 and 31.40–40(e) shall apply to nuclear tankships on an international voyage.

§ 31.40–5 Cargo Ship Safety Construction Certificate—T/ALL.

(a) All tankships on an international voyage are required to have a Cargo Ship Safety Construction Certificate. This certificate shall be issued by the U.S. Coast Guard or the American Bureau of Shipping to certain vessels on behalf of the United States of America as provided in Regulation 12, Chapter I, of the International Convention for Safety of Life at Sea, 1960.

(b) All such tankships shall meet the applicable requirements of this chapter for tankships on an international voyage.

§ 31.40–10 Cargo Ship Safety Equipment Certificate—T/ALL.

(a) All tankships on an international voyage are required to have a Cargo Ship Safety Equipment Certificate.

(b) All such tankships shall meet the applicable requirements of this chapter for tankships on an international voyage.

§ 31.40–15 Cargo Ship Safety Radiotelegraphy Certificate—T/ALL.

(a) The application for a Cargo Ship Safety Radiotelegraphy Certificate is made on FCC Form 801 to the local office of the Federal Communications Commission.

(b) Where applicable, a Cargo Ship Safety Radiotelegraphy Certificate will be issued by the Federal Communications Commission to a tankship meeting its requirements for a tankship fitted with a radiotelegraph installation.

§ 31.40–20 Cargo Ship Safety Radiotelephony Certificate—T/ALL.

(a) The application for a Cargo Ship Safety Radiotelephony Certificate is made on FCC Form 801 to the local office of the Federal Communications Commission.

(b) Where applicable, a Cargo Ship Safety Radiotelephony Certificate will be issued by the Federal Communications Commission to a tankship meeting its requirements for a tankship fitted with a radiotelephone installation.

§ 31.40–25 Exemption Certificate—T/ALL.

(a) A tankship may be exempted by the Commandant from complying with certain requirements of the Convention under his administration upon request made in writing to him and transmitted via the Officer in Charge, Marine Inspection.

(b) When an exemption is granted to a tankship by the Commandant under and in accordance with the Convention, an Exemption Certificate describing such exemption shall be issued through the appropriate Officer in Charge, Marine Inspection, in addition to other required certificates.

§ 31.40–30 Nuclear Cargo Ship Safety Certificate—T/ALL.

(a) All nuclear tankships on an international voyage are required to have a Nuclear Cargo Ship Safety Certificate.

(b) All such ships shall meet the applicable requirements of this chapter for nuclear vessels on an international voyage.

(c) Nuclear vessels cannot be exempted from any requirements of the Convention.

§ 31.40–35 Posting of Convention certificates—T/ALL.

(a) The certificates described in this subpart, or certified copies thereof, when issued to a vessel shall be posted in a prominent and accessible place on the tankship.

(b) The certificates shall be carried in a manner similar to that described in § 31.05–5 for a certificate of inspection.

§ 31.40–40 Duration of Convention certificates—T/ALL.

(a) A Cargo Ship Safety Equipment Certificate shall be issued for a period of not more than 24 months.

(b) A Cargo Ship Safety Construction Certificate shall be issued for a period of not more than 60 months.

(c) A Cargo Ship Safety Radiotelegraphy Certificate and a Cargo Ship Safety Radiotelephony Certificate shall be issued for a period of not more than 12 months.

(d) An Exemption Certificate shall not be valid for longer than the period of the certificate to which it refers.

(e) The Nuclear Cargo Ship Safety Certificate shall be issued for a period of not more than 12 months.

(f) A Convention certificate may be withdrawn, revoked, or suspended at any time when it is determined the vessel is no longer in compliance with applicable requirements. (See § 2.01–70 of this chapter for procedures governing appeals.)

§ 31.40–45 American Bureau of Shipping—T/ALL.

(a) The American Bureau of Shipping, with its home office at 45 Broad Street, New York, N.Y., 10004, is hereby designated as an organization duly authorized to issue the "Cargo Ship Safety Construction Certificate" to certain tankships on behalf of the United States of America as provided in Regulation 12, Chapter I, of the International Convention for Safety of Life at Sea, 1960, and Executive Order 11239 and the certificate shall be subject to the requirements in this subpart. The American Bureau of Shipping is authorized to place the official seal of the United States of America on the certificate. This designation and delegation to the American Bureau of Shipping shall be in effect from May 26, 1965, until terminated by proper authority and notice of cancellation is published in the FEDERAL REGISTER.

(b) At the option of the owner or agent of a tankship on an international voyage and on direct application to the American Bureau of Shipping, the Bureau may issue to such tankship a Cargo Ship Safety Construction Certificate, having a period of validity of not more than 60 months after ascertaining that the tankship:

(1) Has met the applicable requirements of the Convention; and,

(2) Is currently classed by the Bureau and classification requirements have been dealt with to the satisfaction of the Bureau.

(c) When the Bureau determines that a tankship to which it has issued a Cargo Ship Safety Construction Certificate no longer complies with the Bureau's applicable requirements for classification, the Bureau shall immediately furnish to the Coast Guard all relevant information, which will be used by the Coast Guard to determine whether or not to withdraw, revoke or suspend the Cargo Ship Safety Construction Certificate.

(Sec. 25, 41 Stat. 998, as amended, sec. 701, 62 Stat. 731, as amended; 46 U.S.C. 881, 18 U.S.C. 701)

PART 32—SPECIAL EQUIPMENT, MACHINERY, AND HULL REQUIREMENTS

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32.70–1 Application—TB/ALL.
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AUTHORITY: The provisions of this Part 32 issued under R.S. 4405, as amended, 4417a, as amended, 4462, as amended; 46 U.S.C. 375, 391a, 416. Interpret or apply sec. 3, 68 Stat. 675; 50 U.S.C. 198; E.O. 11239, July 31, 1965, 30 F.R. 9671, 3 CFR, 1965 Supp. Treasury Department Orders 120, July 31, 1950, 15 F.R. 6521; 167–14, Nov. 26, 1954, 19 F.R. 8026.

Subpart 32.01—Safety Requirements

§ 32.01–1 Means of escape—T/ALL.

On all tankships where the plans and arrangements will possibly permit, all passageways leading to living quarters, or places where anyone may be regularly employed, shall be provided with not less than two avenues of escape so located that if one of such avenues is not available another may be. The locality and arrangement of such additional means of escape shall be determined by the inspectors as will in their judgment best carry out the purpose for which this provision was made.

§ 32.01–5 Lifelines—TB/OCLB.

On all tank vessels where the distance is more than 150 feet between deck houses, a wire cable shall be stretched between the deck houses at all times when the vessel is loaded and being navigated, this cable to be not less than 5 feet from the deck; and there shall be attached at all times to the cable a traveler with a line of sufficient continuous length to insure its operation in order that communication between both ends of the vessel may be facilitated at all times: *Provided*, That in addition to the traveler with the endless whip, as many loose rings with lanyards attached may be placed on the cable as may be deemed necessary by the master in charge of the vessel: *Provided further*, That a fore and aft raised bridge shall be accepted in lieu of the wire cable and traveler.

§ 32.01–10 Rails—TB/ALL.

(a) All tank vessels, except unmanned tank barges, the construction or conversion of which is started on or after January 1, 1957, shall be fitted with fixed or portable rails on decks and bridges. All rails shall be in at least two courses, including the top, and shall be at least 36 inches high, and in no case shall the clear spaces between the courses exceed 18 inches. However, on tank vessels operating on ocean waters the outboard rails on all decks shall be in at least three courses, including the top, and shall be evenly spaced and shall be at least 36 inches high. All rails shall consist of solid or tubular sections or chains or wire rope or a combination thereof.

(b) For all tank vessels, except those navigating the rivers only, the construction or conversion of which was started

after September 11, 1946, and prior to January 1, 1957, rails on decks or bridges, shall be in at least two courses, including the top, and shall be at least 36 inches high.

§ 32.01–15 Guards at dangerous places—TB/ALL.

All exposed and dangerous places such as gears and machinery shall be properly protected with covers, guards or rails in order that the danger of accidents may be minimized. On vessels equipped with radio communication, the lead-ins shall be efficiently incased or insulated to insure against accidental shock. Such lead-ins shall be located so as not to interfere with the launching of lifeboats and liferafts.

Subpart 32.05—Markings

§ 32.05–1 Draft marks—TB/ALL.

(a) All tank vessels of 50 gross tons and over shall have the draft of the vessel plainly and legibly marked upon the stem and upon the sternpost or rudderpost or at any place at the stern of the vessel as may be necessary for easy observance. The draft shall be taken from the bottom of the keel at the marks to the surface of the water, the bottom of the mark to indicate the draft in feet.

(b) In cases where the keel does not extend forward or aft to the location of the draft marks, due to raked stem or cutaway skeg, the datum line from which the drafts shall be taken, shall be obtained by projecting the line of the bottom of the keel forward or aft, as the case may be, to the location of the draft marks.

(c) In cases where a vessel may have a skeg or other appendage extending locally below the line of the keel, the draft at the end of the vessel adjacent to such appendage shall be measured to a line tangent to the lowest part of such appendage and parallel to the line of the bottom of the keel.

§ 32.05–5 Vessel's name on equipment—TB/ALL.

The equipment of all tank vessels, such as fire hose, fire axes, lifeboats, liferafts, life preservers, and lifefloats, shall be painted or branded with the name of the vessel upon which they are used.

§ 32.05–10 Name of tankship—T/ALL.

Every tankship not documented by the Commissioner of Customs shall have the name marked upon each bow and upon the stern, and the home port shall also be marked upon the stern. The name shall be in a light color on a dark ground, or in a dark color on a light ground, and shall be distinctly visible. The smallest letters used shall be not less than 4 inches in size. In addition, every tankship shall have her name conspicuously displayed in distinct plain letters, of not less than 6 inches in size, on each outer side of the pilothouse.

§ 32.05–15 Name of tank barge—B/ALL.

Every tank barge not documented by the Commissioner of Customs shall have its name or number carved, punch-marked, or welded on the main beam, inside the cargo hatch, or other suitable permanent part of the vessel's structure for the purpose of identification. The vessel's name or number shall be so displayed at the highest part of the vessel's hull or permanent structure that the name or number can be seen from either side.

Subpart 32.15—Navigation Equipment

§ 32.15–1 Fog sound signal devices—TB/ALL.

(a) The efficient fog bell required upon vessels by law shall be held to mean a bell not less than 8 inches in diameter from outside to outside and constructed of bronze or brass or other material equal thereto in tone and volume of sound, and located where the sound shall be the least obstructed.

(b) In addition to the bell required in paragraph (a), all tankships of over 350 feet in length, other than those operating exclusively on the Great Lakes or the inland waters of the United States, shall be provided with a fog gong which will produce a sound easily distinguishable from the bell required by paragraph (a) and which shall have a range of audibility approximating that of the bell.

§ 32.15–5 Whistles—T/ALL.

(a) Each tankship shall be provided with an efficient whistle sounded by steam or by some substitute for steam to give the necessary whisite signals. All whistles shall be placed at an elevation of not less than 6 feet above the top of the pilothouse, where the clearance for passing under bridges will permit it. Tankships navigating the Red River of the North, Yukon, and similar rivers, and rivers whose waters flow in the Gulf of Mexico, and tankships of less than 100 gross tons may have their whistles located not less than 2 feet above the tops of their pilothouses. Such whistles or substitutes shall be satisfactory in sound and source of power for the purpose intended.

(b) On tankships contracted for on and after November 19, 1955 means shall be provided to operate the whistle from a position adjacent to the main steering station and from the steering station on top of the pilothouse where such steering station is fitted. Details of the whistle operating devices shall meet the requirements of Subparts 113.05 and 113.65 of Subchapter J (Electrical Engineering) of this chapter.

§ 32.15–10 Sounding machines—T/OCL.

All tankships of 500 gross tons and over shall be equipped with an efficient mechanical or electronic deep-sea sounding apparatus, in addition to the ordinary deep-sea hand lead. The mechanical or electronic deep-sea sounding apparatus above required shall be installed, kept in working order, and ready for immediate use: *Provided*, That tank vessels of less than 1,500 gross tons navigating the Great Lakes exclusively need not be equipped with deep-sea sounding apparatus as required by this section.

§ 32.15–15 Anchors for seagoing barge—B/OC.

Every seagoing barge shall be equipped with at least one anchor with suitable chain or cable to be at least equivalent to the requirements of the American Bureau of Shipping rules.

§ 32.15–20 Radiotelegraph and radiotelephone—T/ALL.

(a) Radiotelegraph and radiotelephone installations are required on certain tankships. Details of the application of these requirements, as well as the details of the installations, shall be as required by the statutes and regulations under the jurisdiction of the Federal Communications Commission.

(b) For the communication system required with the radiotelegraph and radiotelephone installations on a tank ship contracted for on or after November 19, 1955 see Subparts 113.05 and 113.30 of Subchapter J (Electrical Engineering) of this chapter.

§ 32.15–25 Radio direction finder—T/OC.

(a) All tankships of 1,600 gross tons and over on an international voyage or in ocean service shall be fitted with a radio direction finder. Details of the installation shall be as required by the statutes and regulations under the jurisdiction of the Federal Communications Commission. Such tankships of over 1,600 gross tons, but not over 5,000 gross tons, construction or conversion of which was started prior to November 19, 1952, need not meet the requirements of this section until November 19, 1954.

(b) For the communication system required with the radio direction finder installation on a tankship contracted for on or after November 19, 1955 see Subparts 113.05 and 113.30 of Subchapter J (Electrical Engineering) of this chapter.

Subpart 32.20—Equipment Installations

§ 32.20–1 Equipment installations on vessels during World War II—TB/ALL.

Boilers, pressure vessels, machinery, piping, electrical and other installations, including lifesaving, firefighting and other safety equipment, installed on vessels during the Unlimited National Emergency declared by the President on May 27, 1941, and prior to the termination of Title V of the Second War Powers Act, as extended (sec. 501, 56 Stat. 180, 50 U.S.C. 635), which do not fully meet the detailed requirements of the regulations in this chapter, may be continued in service if found to be satisfactory by the Commandant for the purpose intended. In each instance prior to final action by the Commandant, the Officer in Charge, Marine Inspection, shall notify Headquarters of the facts in the case, together with recommendations relative to suitability for retention.

§ 32.20–5 Pressure vacuum relief valves—TB/ALL.

The pressure vacuum relief valve shall be of a type and size approved by the Commandant for the purpose intended.

For specifications and procedures re approval, see Subpart 162.017 of Subchapter Q (Specifications) of this chapter.

§ 32.20–10 Flame arresters—TB/ALL.

Flame arrester shall be of a type and size approved by the Commandant for the purpose intended. For specifications and procedures re approval, see Subpart 162.016 of Subchapter Q (Specifications) of this chapter.

§ 32.20–20 Liquid level gaging—T/ALL.

On tankships, the construction or conversion of which is started on or after July 1, 1951, a method for determining the level of the liquid in a cargo tank without opening ullage holes, cargo hatches, or Butterworth plates, shall be provided on all tankships certificated for the carriage of Grade A liquids: *Provided*, That ullage holes fitted with sounding pipes tightly secured to the underside of the tank tops, opens at the bottom, and extending to within 18 inches or less of the bottom of the tank shall be considered as complying with the foregoing requirement.

Subpart 32.25—General Alarm Systems

§ 32.25–1 Alarm bells for tankships constructed on or after September 15, 1943—T/ALL.

(a) All tank ships of over 100 gross tons, the construction of which is begun on or after September 15, 1943, shall have all sleeping accommodations and machinery spaces equipped with a sufficient number of alarm bells so located as to warn all occupants.

(b) The bells shall be controlled by a manually operated contact maker located in the pilothouse, in an accessible location in the deck officers' quarters, and in the engineroom. Each of the contact makers in the latter two locations shall be protected against tampering by means of an enclosure provided with a breakable glass window.

(c) The alarm system installation shall meet the requirements of Subparts 113.05 and 113.25 of Subchapter J (Electrical Engineering) of this chapter, except that vessels the construction of which was started prior to November 19, 1955, need only meet the requirements of § 113.25–90 thereof and the number and location of the contact makers shall comply with paragraph (b) of this section.

§ 32.25–5 Alarm bells for tankships constructed prior to September 15, 1943—T/ALL.

(a) All tankships, the construction of which was begun prior to September 15, 1943, shall have all sleeping accommodations equipped with a sufficient number of alarm bells so located as to warn all the occupants. The alarm bells, if electric, shall be operated from an open switch from the pilothouse or bridge. The bells shall be of such size, character, and construction as to provide an alarm throughout the spaces for which they are provided.

(b) The alarm system installation shall meet the requirements of § 113.25–90 of Subchapter J (Electrical Engineering) of this chapter.

§ 32.25–10 Alarm bells for manned barges—B/OC.

Each tank barge of over 100 gross tons, where the crew is divided into watches for the purpose of steering the vessel, shall be provided with a suitable alarm bell installation.

Subpart 32.30—Sound Powered Telephone, Voice Tube, and Engine Order Telegraph Systems

§ 32.30–1 Voice tubes or telephone equipment—T/ALL.

(a) Tankships shall be equipped with an efficient means of communication between the pilothouse and (1) the engineroom, (2) the steering gear room, and (3) the emergency steering station.

(b) Where tankships are equipped with a gyro compass system and/or radar plan position indicator, an efficient means of communication shall be provided between the pilothouse and the master compass and/or radar plan position indicator when such equipment is remotely located from the pilothouse.

(c) Where tankships are equipped with a radio and/or a radio direction finder, an efficient means of communication shall be provided between the pilothouse and this equipment as covered in § 113.30–5(e) of Subchapter J (Electrical Engineering) of this chapter when such equipment is remotely located from the pilothouse.

(d) The efficient means of communication referred to in this section shall be either a voice tube or sound powered telephone system.

(e) Telephone and voice tube equipment and the installation thereof shall meet the requirements of Subparts 113.05 and 113.30 of Subchapter J (Electrical Engineering) of this chapter except that tank ships the construction of which was started prior to November 19, 1955, need only meet the requirements of § 113.30–90.

§ 32.30–5 Engine order telegraph equipment—T/ALL.

(a) Tankships shall be equipped with an efficient means of transmitting engine orders from the pilothouse to the engineroom and of transmitting acknowledgments of such engine orders from the engine room to the pilothouse.

(b) The efficient means of transmitting engine orders and installation of the equipment shall meet the requirements of Subparts 113.05 and 113.35 of Subchapter J (Electrical Engineering) of this chapter except that tankships the construction of which was started prior to November 19, 1955, need meet only the requirements of § 113.35–90.

§ 32.30–10 Inspections—T/ALL.

All communication equipment between the pilothouse, engineroom, steering gear room, and the emergency steering station shall be inspected and tested in accordance with the requirements of § 111.05–10(c)(16) and (d)(1) of Subchapter J (Electrical Engineering) of this chapter.

Subpart 32.35—Main and Auxiliary Machinery

§ 32.35–1 Boilers and Machinery—TB/ALL.

Boilers, main and auxiliary machinery, and piping systems shall conform to the requirements of Subchapter F (Marine Engineering) of this chapter, except as otherwise provided for in this subchapter.

§ 32.35–5 Installation of internal combustion engines—TB/ALL.

Each internal combustion engine located on the weather deck shall be provided with a ventilated metal hood or, where space permits, with a well-ventilated metal housing of sufficient size to allow for proper operation and maintenance.

§ 32.35–10 Steering apparatus on tank vessels—TB/ALL.

Tank vessels shall be provided with steering apparatus as required by Subpart 57.25 of Subchapter F (Marine Engineering) of this chapter.

Subpart 32.40—Accommodations

§ 32.40–1 Crew accommodations on tankships of 100 gross tons or over constructed after January 1, 1938—T/ALL.

On all tankships of 100 gross tons and over, the construction of which is begun after January 1, 1938, the minimum requirements relative to construction, location, and equipment of crew accommodations are as follows:

(a) *Sleeping quarters.* At least 120 cubic feet of space and not less than 16 square feet of deck areas shall be allotted to each member of the crew for sleeping purposes. In measuring sleeping quarters allotted to crews of vessels, the Officer in Charge, Marine Inspection, shall not deduct from the total volume or from the deck area any equipment contained therein which is provided for the exclusive use of the crew. Not more than one bunk shall be placed above another, and the lower bunk shall be at least 12 inches above the deck. The upper bunk shall be located as nearly as practicable midway between the lower bunk and the lower side of the deck beams overhead.

(b) *Toilet and washing facilities.* (1) Each such tankship shall be provided with at least one washbasin, one bathtub or shower, and one toilet for each eight members, or portion thereof, in the crew to be accommodated. The crew to be accommodated shall include all members who do not occupy rooms to which private facilities are attached.

(2) When the engineroom crew, exclusive of licensed officers and others separately provided for, exceeds eight, separate washing facilities shall be provided.

(3) Vessels contracted for after January 1, 1949, shall have the toilet rooms separate from the washrooms, and at least one washbasin shall be fitted in each toilet room.

(c) *Hospital accommodations.* (1) Each tank vessel which in the ordinary course of its trade makes voyages of more than 3 days' duration between ports and which carries a crew of 12 or more, shall be provided with a hospital space. This space shall be situated with due regard to the comfort of the sick so that they may receive proper attention in all weathers.

(2) The hospital shall be suitably separated from other spaces and shall be used for the care of the sick and for no other purposes.

(3) The hospitals shall be fitted with berths in the ratio of 1 berth to every 12 members of the crew or portion thereof who are not berthed in single-occupancy rooms, but the number of berths need not exceed 6.

(d) *Location, construction and equipment.* (1) Crew accommodations shall not be located forward of the collision bulkhead, or where there will be undue risk to members of the crew in getting to stations.

(2) Where crew quarters abut galley, boiler, or engineroom bulkheads, such bulkheads shall be insulated with fire-resistive material to reduce transmission of heat.

(3) Insofar as practicable, crew quarters shall be so located or constructed that they will be protected against objectionable odors of cargo, fuel tanks, paint lockers, oil rooms, bilges, toilets, etc.

(4) All crew spaces shall be adequately lighted, heated and ventilated. The lighting shall comply with the requirements of § 111.50–15 and Subpart 111.60 of Subchapter J (Electrical Engineering) of this chapter.

(5) Bare metal surfaces of ship's sides and metal weather decks overhead which are not decked over with wood externally, shall be covered with suitable fire-resistive material to aid in keeping the crew's quarters dry.

(6) In the ventilation of crew accommodations provisions shall be made for the ingress of fresh air and for the egress of impure air; it shall be adequate for the purpose intended, and so arranged as to be effective in any ordinary weather conditions, and to distribute fresh air without undue discomfort to the occupants. Where natural ventilation is provided, each inlet shall have an area of at least 6 square inches for each person accommodated, the outlet to be at least equal in size to the inlet. In no case shall any one such inlet or outlet have a cross sectional area of less than 24 square inches.

(7) Mechanical ventilation may be provided if such system is equal in effectiveness to the requirements for natural ventilation and is approved by the Commandant. For remote control of mechanical ventilation see §111.50–5 of Subchapter J (Electrical Engineering) of this chapter.

(8) Messrooms shall be provided for both officers and crew, and shall be separate from each other where space and conditions will permit. Such messrooms shall be sufficient in size to accommodate all persons allotted to such space: *Provided, however,* That this subparagraph need not apply to vessels operating on the Great Lakes, lakes, bays and sounds, or rivers.

(9) All washbasins, shower baths, or tubs required by the regulations in this subchapter shall be equipped with proper plumbing, including hot and cold running water. Washbasins for the crew may be located in the crew's sleeping quarters, if properly installed, equipped with proper plumbing for draining and supplied with hot and cold running water.

(10) All toilets shall be installed and equipped with the proper plumbing for flushing. Where more than one toilet is located in a space or compartment, each toilet shall be separated with a screen constructed of fire-resistive material to afford privacy. Such screens may be installed so as to be open at top and bottom for ventilation purposes.

(11) Floors of toilets and washrooms shall be covered with cement, tile, or other suitable covering.

(12) On each such tankship there shall be provided at least one sink or other suitable means for washing clothes.

(13) Each hospital shall have a toilet, washbasin, and bathtub or shower conveniently situated.

(14) A clothes locker shall be provided for each person accommodated of a size not less than 12" x 21" x 5' high and so placed as to be readily accessible.

(15) Living accommodations shall be properly screened to exclude insects.

§ 32.40–5 Crew accommodations on tankships of less than 100 gross tons and manned tank barges constructed after January 1, 1938—TB/ALL.

All tankships of less than 100 gross tons and all manned tank barges, the construction of which is begun after January 1, 1938, shall be provided with crew accommodations of sufficient size, adequate construction, and with suitable equipment to provide for the protection and accommodations of its crew in a manner practicable for the size, facilities and service of the vessel, and consistent with the principles underlying the requirements for crew accommodations on tankships of 100 gross tons or more.

§ 32.40–10 Crew accommodations on tankships of 100 gross tons or over constructed after March 4, 1915, and prior to January 1, 1938—T/ALL.

On all tankships of 100 gross tons or over the construction of which was begun after March 4, 1915, and prior to January 1, 1938, the crew accommodations shall be of a character and number in compliance with § 32.40–1 (a), (b), (c), except that separate washing facilities are not required where the engineroom crew, exclusive of licensed officers, and others separately provided for, does not exceed 10. In cases where an improvement is necessary in the sanitary conditions of such vessels, § 32.40–1(d) will also apply in principle insofar as space and conditions will permit.

§ 32.40–15 Crew accommodations on tankships and manned tank barges not otherwise provided for—TB/ALL.

All tankships and all manned tank barges not heretofore provided for shall have crew quarters and washing and toilet facilities in keeping with the age, size, facilities and service of the vessel, and suitable for the accommodations and protection of the crew.

Subpart 32.45—Electrical Installations

§ 32.45–1 Requirements for tank vessels the construction or conversion of which is contracted for on or after November 19, 1955—TB/ALL.

(a) *Application.* The electrical installation on a tank vessel the construction or conversion of which is contracted for on or after November 19, 1955 shall comply with the requirements contained in this section in addition to those contained in Subchapter J (Electrical Engineering) of this chapter except as such latter regulations are modified by this section. Specific additional requirements for tank vessels carrying Grade A, B, C or D liquid cargo are contained in paragraphs (h) and (i) of this section.

(b) *Cable location.* Where practicable, electric cable shall be located well inboard from the sides, preferably along or near the centerline, to reduce the risk of injury in the event of collision, but it shall be kept clear of cargo tank openings. Specific additional cable location requirements for cargo pump rooms and enclosed spaces immediately above or adjacent to cargo tanks are contained in paragraphs (f) and (h) of this section.

(c) *Equipment location.* Except where Grade E liquid cargo only is involved, switchboards, distribution panels, switches, fuses, and other circuit-interrupting or power devices shall not be installed in cargo pumprooms nor in enclosed spaces immediately above or adjacent to cargo tanks. Regardless of the grade of liquid cargo handled storage batteries shall not be located in cargo pumprooms.

(d) *Portable equipment.* Portable equipment shall be of an approved type. When the vessel is not gas free, no portable electrical equipment shall be used in the cargo or fuel oil tanks, the cargo pumprooms or any enclosed spaces immediately above or adjacent to the bulk cargo tanks, except that lighting may be effected by the use of approved explosion-proof, self-contained, battery-fed lamps.

(e) *Explosion-proof installations.* Where explosion-proof equipment is required, the equipment and installation thereof shall comply with § 111.60–40 of Subchapter J (Electrical Engineering) of this chapter.

(f) *Enclosed spaces.* (1) The lighting of enclosed spaces immediately above or adjacent to cargo tanks for Grade A, B, C or D liquid cargo shall be effected by means of approved explosion-proof or

magazine type lighting fixtures in accordance with the requirements of § 111.170-10(c) of Subchapter J (Electrical Engineering) of this chapter.

(2) Through runs of electric cable are permitted.

(g) *General cargo spaces.* (1) General cargo spaces located beyond the segregation spaces of tank vessels carrying Grade A, B, C or D liquid cargo shall have no special restrictions in regard to electrical installations.

(2) General cargo spaces, regardless of location, of tank vessels carrying Grade E liquid cargo only shall have no special restrictions in regard to electrical installations.

(h) *Cargo pumproom handling Grade A, B, C, or D liquid cargo.* (1) Lighting in cargo pumprooms handling Grade A, B, C, or D liquid cargo shall be accomplished either through permanently fixed glass lenses fitted in the bulkhead and/or overhead, or by the use of explosion-proof fixtures, except that explosion-proof fixtures may be installed only under certain conditions. For detail requirements see § 111.70-10 (c) of Subchapter J (Electrical Engineering) of this chapter.

(2) Through runs of electric cable, regardless of how they may be protected, are prohibited.

(i) *Weather decks of tank vessels handling Grade A, B, C, or D liquid cargo.* Motors, their control equipment, and other electrical equipment and installations located on or above the weather decks within 10 feet of the cargo tank openings, cargo pumproom doors or cargo pump room ventilation outlets, or cargo tank vent terminations shall be explosion-proof. Explosion-proof equipment installed in locations exposed to the weather shall be watertight or shall be enclosed in watertight housings, or protected against the entrance of water by other approved means.

§ 32.45-5 Requirements for tank vessels the construction or conversion of which was started on or after November 10, 1936 but prior to November 19, 1955—TB/ALL.

(a) *Application.* The requirements of this section shall apply to all tank vessels the construction or conversion of which was started on or after November 10, 1936, but prior to November 19, 1955.

(b) *General.* The electrical installation shall be in accordance with this section, and to the extent that such installation is not covered by this section it shall be at least equivalent to the Commandant's general requirements.

(c) *Existing arrangements.* Existing arrangements, materials, and facilities previously approved will be considered satisfactory so long as they are maintained in good condition to the satisfaction of the Officer in Charge, Marine Inspection. For detailed requirements see § 111.70-90(a) of Subchapter J (Electrical Engineering) of this chapter minor repairs and minor alterations may be made to the same standard as the original installation.

(d) *New installations.* New installations or major replacements shall meet the applicable requirements of § 32.45-1.

(e) *Location of storage batteries.* Storage batteries shall not be located in cargo pumprooms. The space in which they are located shall be well ventilated and they shall be protected against mechanical and electrical injury including short circuiting and overloading. Batteries shall be secured against movement, and acid batteries shall be set in lead-lined trays at least 3 inches deep of at least 4-pound sheet lead.

(f) *Installations made during the Unlimited National Emergency.* Electrical equipment installed during the Unlimited National Emergency as defined in § 110.25-5 of Subchapter J (Electrical Engineering) of this chapter and not complying with the requirements in this subchapter may be continued in service if found to be satisfactory by the Commandant for the purpose intended.

(g) *Cargo pumprooms and enclosed spaces of tank vessels constructed on or after July 1, 1951, but prior to November 19, 1955*—(1) *Application.* The requirements of this paragraph shall apply to cargo pumprooms and enclosed spaces immediately above the bulk cargo tanks of tank vessels carrying Grade A, B, C or D liquid cargo, the construction or conversion of which vessels was started on or after July 1, 1951, but prior to November 19, 1955. There are no special restrictions in regard to the electrical installations in cargo pumprooms and enclosed spaces of tank vessels carrying only Grade E liquid cargo.

(2) *Cable location.* Through runs of electric cable are permitted.

(3) *Equipment.* No electric lighting or power circuit interrupting or power devices shall be installed in pumprooms. Enclosed spaces immediately above the bulk cargo tanks shall contain no electrical circuit interrupting or power devices.

(4) *Lighting.* Lighting shall be effected by means of approved explosion-proof or magazine type lighting fixtures. When the vessel is not gas free no portable lighting equipment shall be used except approved explosion-proof, self-contained, battery-fed lamps.

(h) *General cargo spaces of tank vessels constructed on or after July 1, 1951, but prior to November 19, 1955 and carrying Grade E liquid cargo only.* General cargo spaces, regardless of location, of tank vessels constructed on or after July 1, 1951, but prior to November 19, 1955, and carrying Grade E liquid cargo only, shall have no special restrictions in regard to electrical installations.

(i) *Cargo pumprooms and enclosed spaces of tank vessels constructed on or after November 10, 1936, but prior to July 1, 1951*—(1) *Application.* The requirements of this paragraph shall apply to cargo pumprooms for Grade A, B, C or D liquids and to enclosed spaces required to segregate Grade A, B, C or D liquid cargo tanks from other spaces, all on tank vessels the construction or conversion of which was started on or after November 10, 1936, but prior to July 1, 1951.

(2) *General.* The installation covering the cable, cable fittings and method of making wiring connections, lighting fixtures, and motors shall comply with the requirements of § 111.70-90(d) of Subchapter J (Electrical Engineering) of this chapter.

(3) *Ventilation.* The motor-driven ventilation system for the cargo pump motor when located in the pumproom is to be so interlocked that the pump motor cannot be started prior to a circulation of air. The air ducts are to lead to and from the atmosphere outside the pumproom and are to terminate not less than 3 feet above the deck and not less than 6 feet from any cargo tank vent. (See § 32.60-20.)

§ 32.45-10 Requirements for tank vessels the construction or conversion of which was started prior to November 10, 1936—TB/ALL.

(a) *Application.* The requirements of this section shall apply to all tank vessels the construction or conversion of which was started prior to November 10, 1936.

(b) *General.* The electrical installation shall be maintained in a safe and in a good mechanical condition, and shall comply with the regulations in effect when the vessel was built, or to the requirements of a recognized classification society. Any major change in the electrical installation or any conversion shall comply with the requirements of this subpart applicable to new vessels.

(c) *Pumprooms and enclosed spaces of tank vessels handling Grade A, B, C or D liquid cargo.* The electrical installation in the pumprooms and enclosed spaces immediately adjoining cargo tanks (except in pump enginerooms as provided in § 32.70-20) of tank vessels handling Grade A, B, C or D liquid cargo shall be made to comply with §§ 32.45-1 (b) and (c), 32.45-5(b) and (g) and §§ 111.55-1, 111.55-15 and 111.60-5 of Subchapter J (Electrical Engineering) all of this chapter, to the extent that the changes are, in the opinion of the Officer in Charge, Marine Inspection, necessary in the interest of safety.

Subpart 32.50—Pumps, Piping, and Hose for Cargo Handling

§ 32.50-1 Cargo pumps for tank vessels constructed on or after November 10, 1936—TB/ALL.

On all tank vessels, the construction or conversion of which is started on or after November 10, 1936, the cargo pumps shall be designed and installed to minimize the danger of sparking. Special care shall be exercised in the design of packing spaces in order to secure ample depth and accessibility of glands. Where cargo pump shafts pierce gastight bulkheads, stuffing boxes with readily accessible gastight glands shall be provided.

§ 32.50-3 Cargo discharge—TB/ALL.

(a) Pumps or other acceptable means shall be used to discharge cargo from gravity type cargo tanks vented at gauge pressures of 4 pounds per square inch or less.

(b) The use of compressed air as the primary means of discharging cargo from such tanks is prohibited.

§ 32.50–5 Cargo pump fittings and controls on tank vessels constructed on or after November 10, 1936—TB/ALL.

(a) On all tank vessels, the construction or conversion of which is started on or after November 10, 1936, where a cargo pump is capable of developing a pressure exceeding 125 pounds at the pump under shutoff head conditions (based on water), a suitable relief valve shall be installed between the pump and shutoff valve in the cargo pump discharge and piped back into the suction. The relief valve setting shall not exceed the pressure for which the piping system is designed.

(b) A pressure gage shall be installed for each pump discharge, and it shall be located at a point visible with respect to the pump controls.

§ 32.50–10 Cargo pumps on tank vessels with independent cargo tanks which were constructed prior to November 10, 1936—TB/ALL.

(a) Cargo pumps on tank vessels, the construction or conversion of which was started prior to November 10, 1936, may be located in a hold space containing independent cargo tanks or on deck. If the pump driving unit is of the type permitted in cargo pumprooms, it also may be located in the hold space. If other types of driving units are used, they shall be located on deck or in an engine compartment. If the pump drive shaft passes through decks or bulkheads into a hold space or pumproom, it shall be provided with suitable stuffing boxes at such points.

§ 32.50–15 Cargo piping on tank vessels constructed on or after July 1, 1951—TB/ALL.

(a) On all tank vessels, the construction or conversion of which is started on or after July 1, 1951, the cargo piping shall be:

(1) A fixed cargo piping system shall be installed on a tank vessel carrying Grade A, B, or C cargo. The piping shall be arranged so as to avoid excessive stresses at the joints. For sizes exceeding 2 inches in diameter, flanged, welded, or other approved types of joints shall be employed. Packing material shall be suitable for the cargo carried. Connections at bulkheads shall be made so that the plating does not form part of a flanged joint. Piping may be carried through bunker spaces and deep tanks provided it is run through a pipe tunnel. The tunnel may be omitted where the pipe is extra heavy, all joints are welded, and bends are installed to provide for expansion and contraction.

(2) Cargo piping, where installed in tank vessels carrying Grade D or E cargo only, shall conform with the requirements contained in subparagraph (1) of this paragraph.

(3) Cargo piping shall not pass through spaces containing machinery where sources of vapor ignition are normally present: *Provided*, That, in special cases the Commandant may permit the piping to pass through such spaces if Grade E liquids only are involved.

(b) Valve operating rods in cargo tanks shall be solid, except that tank barges having plug cocks inside the cargo tanks may have operating rods of extra heavy pipe with the annular space between the lubricant tube and the pipe wall sealed with a nonsoluble material to prevent penetration of the cargo. Valve operating rods shall be of ample size, well guided and supported, and attached to the valve stems in a manner so as to prevent the operating rods from working loose. Where the operating rods pass through a deck, gastight stuffing boxes shall be fitted. The leads of operating rods shall be as direct as possible. Valves shall be of suitable design for the intended service.

(c) All cargo loading and discharge hose connections shall be fitted with valves or blind flanges.

§ 32.50–20 Cargo piping for tank vessels constructed between November 10, 1936, and July 1, 1951—TB/ALL.

(a) On tank vessels, the construction or conversion of which is started on or after November 10, 1936, and prior to July 1, 1951, the piping shall be arranged so as to avoid excessive stresses at the joints. For sizes exceeding 2 inches in diameter, flanged, welded, or other approved types of joints shall be employed. Packing material shall be suitable for the cargo carried. Connections at bulkheads shall be made so that the plating does not form part of a flanged joint. Piping may be carried through bunker spaces and deep tanks provided it is run through a pipe tunnel. The tunnel may be omitted where the pipe is extra heavy, all joints are welded, and bends are installed to provide for expansion and contraction.

(b) Cargo piping shall not pass through spaces containing machinery where sources of vapor ignition are normally present: *Provided*, That in special cases the Commandant may permit the piping to pass through such spaces if Grade E liquids only are involved.

(c) Valve operating rods in the cargo tanks shall be solid and of ample size, well guided and supported, and attached to the valve stems in a manner to guard against their working loose. Where such valve rods pass through the deck, gastight stuffing boxes shall be fitted. The leads of valve rods shall be as direct as possible. All valves and fittings shall be of material, design, and manufacture for the intended service on the cargo system; either rising or nonrising stem valves may be used.

§ 32.50–25 Cargo pumps and piping on tank vessels constructed prior to November 10, 1936—TB/ALL.

On tank vessels, the construction or conversion of which was started prior to November 10, 1936, cargo pumps and piping which do not fully comply with the regulations in this subchapter shall be made as nearly equal to the requirements for tank vessels constructed between November 10, 1936, and July 1, 1951, as is necessary in the interest of safety. Cargo pipe lines may pass through cargo pump engine compartments provided no cargo valves are located therein.

§ 32.50–30 Cargo hose—TB/ALL.

Cargo hose, when carried on tank vessels, shall be of a grade suitable for oil service, and shall be designed to withstand the pressure of the shutoff head of the cargo pump or pump relief valve setting, less static head, but in no case less than 100 pounds per square inch.

§ 32.50–35 Remote manual shutdown for internal combustion engine driven cargo pump on tank vessels—TB/ALL.

(a) Any tank vessel which is equipped with an internal combustion engine driven cargo pump on the weather deck shall be provided with a minimum of one remote manual shutdown station, conspicuously marked, and located at the midpoint of such vessel, or 100 feet from the engine, whichever is the more practical. The remote quick acting manual shutdown shall be installed on the engine so as to provide a quick and effective means of stopping the engine (such as by cutting off the intake air).

(b) This regulation applies to all installations of this type on tank vessels, but for such installations now on existing tankships at the date of next biennial inspection or October 1, 1963, whichever occurs later.

Subpart 32.52—Bilge Systems

§ 32.52–1 Bilge pumps on tank vessels constructed or converted on or after November 19, 1952—TB/ALL.

The number and arrangement of bilge pumps on each tank vessel shall conform to the requirements of Subchapter F (Marine Engineering) of this chapter, except as hereinafter provided in this subpart.

§ 32.52–5 Bilge piping for pump rooms and adjacent cofferdams on tank vessels constructed or converted on or after November 19, 1952—TB/ALL.

(a) Provisions shall be made for removing drainage from the pumproom bilges and adjacent cofferdams. A separate bilge pump, ejector, or bilge suction from a cargo pump or cargo stripping pump may be provided for this purpose. The bilge pump shall not be located in nor shall the piping pass through spaces containing machinery where sources of vapor ignition are normally present.

(b) Where a bilge suction is provided from a cargo or stripping pump, a stop-check valve shall be fitted in the suction branch, and an additional stop valve shall be fitted also if the bilge suction branch can be subjected to a head of oil from the filling line.

(c) Means shall be provided for controlling the cargo or pump room bilge pumps and their suctions or discharges in order that a flooded pump room may be pumped out. Suitable portable or manually operated pumps may be accepted as complying with this provision, or alternatively, the pump controls shall be arranged so that they are operable from inside the pump room and either from an accessible position outside the

pump room, or from the pump room casing above the freeboard deck.

§ 32.52–10 Bilge pumps and piping on tank vessels constructed or converted prior to November 19, 1952—TB/ALL.

(a) On tank vessels, the construction or conversion of which was started prior to November 19, 1952, bilge pumps and piping which do not fully comply with the regulations of this subchapter shall be made as nearly equal to the requirements for tank vessels constructed on or after November 19, 1952, as is necessary in the interest of safety.

(b) Bilge suctions from hold spaces containing independent cargo tanks may be connected to cargo pumps or stripping pumps, provided the installation complies with the requirements of § 32.52–5(b).

Subpart 32.55—Ventilation and Venting

§ 32.55–1 Ventilation of tank vessels constructed on or after July 1, 1951—TB/ALL.

(a) On all tanks vessels, the construction or conversion of which is started on or after July 1, 1951, all enclosed parts of the vessel, other than cargo, fuel and water tanks, cofferdams and void spaces, shall be provided with efficient means of ventilation.

(b) Compartments containing machinery where sources of vapor ignition are normally present shall be ventilated in such a way as to remove vapors from points near the floor level or the bilges. Effective steam or air actuated gas ejectors, blowers or ventilators fitted with heads for natural ventilation, with at least one duct extending to immediately below the floor plates will be approved for this purpose. Machinery spaces below the freeboard deck, in which fuels with flash point of 110° F. or lower are used, shall be equipped with power ventilation. (See § 32.60–20 for other requirements concerning pumprooms.)

§ 32.55–5 Ventilation of tank vessels constructed between November 10, 1936, and July 1, 1951—TB/ALL.

(a) On tank vessels, the construction or conversion of which was started on or after November 10, 1936, and prior to July 1, 1951, all enclosed parts of the vessel, other than cargo, fuel, and water tanks and cofferdams, shall be provided with efficient means of ventilation.

(b) Pumprooms and compartments containing machinery where sources of vapor ignition are normally present shall be ventilated in such a way as to remove vapors from points near the floor level or the bilges. Effective steam or air actuated gas ejectors or blowers or ventilators fitted with heads for natural ventilation, will be approved for this purpose. (See § 32.65–20 for other requirements concerning pumprooms.)

§ 32.55–10 Ventilation for tank vessels constructed prior to November 10, 1936—TB/ALL.

Ventilation of tank vessels, the construction or conversion of which was started prior to November 10, 1936, shall be equal to the requirements of tank vessels constructed before July 1, 1951, where the changes are, in the opinion of the Officer in Charge, Marine Inspection, necessary in the interest of safety.

§ 32.55–15 Ventilation for hold spaces—TB/ALL.

Hold spaces containing independent cargo tanks shall be considered to be equivalent to cargo pumprooms and shall be ventilated and safeguarded as such.

§ 32.55–20 Venting of cargo tanks of tankships constructed on or after July 1, 1951—T/ALL.

(a) *Venting required.* (1) On all tankships, the construction or conversion of which is started on or after July 1, 1951, each cargo tank shall be equipped with a vent. The diameter of a vent shall be not less than 2½ inches.

(2) In any case where a venting system is required for a particular grade of liquid, the venting system permitted for a higher grade of liquid may be used instead.

(b) *Grade A liquids.* (1) Cargo tanks in which Grade A liquids are to be transported shall be fitted with a venting system consisting of a branch vent line from each cargo tank connected to a vent header which shall extend to a height above the weather deck equal to at least one-third the beam of the vessel and shall terminate at a comparable distance from any other living or working space, ventilator inlet, or source of ignition. When special conditions will prevent the vent line or header outlets being permanently installed at a height above the deck of one-third the beam of the vessel, then an adjustable system shall be provided which, when extended vertically, shall be capable of reaching a height of one-third the beam of the vessel.

(2) A weather hood may be installed at the vent outlet providing it is of such design as not to direct the flow of vapor below the horizontal.

(3) The branch vent lines shall consist of either:

(i) Pipe with no valves or other hindrances to a free flow of gas; or,

(ii) Piping fitted with a pressure vacuum relief valve, provided means are supplied for relieving all internal pressure on cargo tanks by fitting the valve with a positive means for opening its pressure valve to allow free passage of gases through the branch vent line or by the installation of a by-pass fitted with a manually operated stop valve.

(4) The vent header shall be fitted with a flame arrester or pressure vacuum relief valve. If a pressure vacuum relief valve is used in the header, means shall be provided for relieving all internal pressure on cargo tanks by fitting the valve with a positive means for opening its pressure valve to allow free passage of gases through the header or by the installation of a by-pass fitted with a manually operated stop valve. A suitable means of relieving pressure shall be fitted in the header in order to prevent excess pressure being built up in the tanks, in the event of overfilling of the latter. The vent header system shall be provided with suitable connections for flushing and draining. The vent header system shall be of sufficient capacity as to be able to carry off all displaced air and vapors during loading of the cargo tanks without opening of ullage plates, cargo hatches, etc. See § 32.20–20 for liquid level gaging requirements.

(c) *Grade B or C liquids.* Cargo tanks in which Grade B or C liquids are to be transported shall be fitted with either individual pressure-vacuum relief valves which shall extend to a reasonable height above the weather deck or shall be fitted with a venting system consisting of branch vent lines connected to a vent header which shall extend to a reasonable height above the weather deck and be fitted with a flame arrester or a pressure-vacuum relief valve. The vent header system, if fitted, shall be provided with suitable connections for flushing and draining, and if desired, stop valves may be placed in the individual branch vent lines provided that each stop valve is bypassed by a pressure-vacuum relief valve.

(d) *Grade D or E liquids.* Cargo tanks in which Grade D or E liquids only are to be transported shall be fitted with gooseneck vents and flame screens.

§ 32.55–25 Venting of cargo tanks of tank barges constructed on or after July 1, 1951—B/ALL.

(a) *Venting required.* (1) On all tank barges, the construction or conversion of which is started on or after July 1, 1951, each cargo tank shall be equipped with a vent. The diameter of a vent shall be not less than 2½ inches.

(2) In any case where a venting system is required for a particular grade of liquid, the venting system permitted for a higher grade of liquid may be used instead.

(b) *Grade A, B, or C liquids.* Cargo tanks in which Grade A, B, or C liquids are to be transported shall be fitted with either individual pressure-vacuum relief valves which shall extend to a reasonable height above the weather deck or shall be fitted with a venting system consisting of branch vent lines connected to a vent header which shall extend to a reasonable height above the weather deck and be fitted with a pressure-vacuum relief valve. The vent header system, if fitted, shall be provided with suitable connections for flushing and draining, and if desired, stop valves may be placed in the individual branch vent lines: *Provided,* That each such stop valve is bypassed by a pressure-vacuum relief valve.

(c) *Grade D or E liquids.* Cargo tanks in which Grade D or E liquids only are to be transported shall be fitted with gooseneck vents and flame screens.

§ 32.55–30 Venting of cargo tanks of tank vessels constructed between November 10, 1936, and July 1, 1951—TB/ALL.

(a) *Venting required.* On all tank vessels, the construction or alteration of which is started on or after November 10,

1936, and prior to July 1, 1951, each cargo tank shall be equipped with a vent. The details of the venting system shall meet the requirements of this section, or alternatively, the requirements of either § 32.55–20 or § 32.55–25, as applicable, shall be met.

(b) *Grade A liquids.* (1) Cargo tanks in which Grade A liquids are to be transported shall be fitted with a venting system consisting of branch vent line from each cargo tank connected to a vent header which shall extend to a reasonable height above the weather deck and be fitted with a flame arrester or pressure-vacuum relief valve. Each branch vent line may be provided with a manually operated control valve, provided it is bypassed with a pressure-vacuum relief valve or each cargo tank to which such a branch vent line is connected is fitted with an independent pressure-vacuum relief valve. The vent header system shall be provided with suitable connections for flushing and draining.

(2) In barges with independent tanks carrying Grade A liquids, separate discharge pipes may be fitted to each pressure-vacuum relief valve, or the pressure-vacuum relief valve may be elevated, so that in either case the discharge from such valve will not be less than 7 feet above the deck where practicable.

(c) *Grade B or C liquids.* Cargo tanks in which Grade B or C liquids are to be transported shall be fitted with individual pressure-vacuum relief valves or shall be fitted with a venting system consisting of branch vent lines connected to a vent header which shall extend to a reasonable height above the weather deck and be fitted with a flame arrester or a pressure-vacuum relief valve.

(d) *Grade D or E liquids.* Cargo tanks in which Grade D or E liquids only are to be transported shall be fitted with gooseneck vents and flame screens unless such tanks are vented by pressure-vacuum relief valves or a venting system of branch vent lines and a vent header.

§ 32.55–35 Venting of cargo tanks on tank vessels constructed prior to November 10, 1936—TB/ALL.

The venting of cargo tanks of tank vessels, the construction or alteration of which was started prior to November 10, 1936, shall be made to equal the requirements of tank vessels constructed before July 1, 1951, where the changes are, in the opinion of the Officer in Charge, Marine Inspection, necessary in the interests of safety: *Provided*, That on such vessels carrying Grade A cargo the requirements in § 32.55–30(b) shall be met.

§ 32.55–40 Venting of cargo tanks fitted with inert-gas system—TB/ALL.

A tank vessel equipped with an approved system for maintaining all cargo tank vapor spaces nonflammable shall be accepted in lieu of the requirements of §§ 32.55–20, 32.55–25, 32.55–30 or 32.55–35.

§ 32.55–45 Venting of cofferdams and void spaces of tank vessels constructed on or after November 10, 1936—TB/ALL.

(a) Except as provided in paragraph (b) of this section, on all tank vessels, the construction or conversion of which was started on or after November 10, 1936, cofferdams and void spaces shall be provided with gooseneck vents fitted with a flame screen or pressure-vacuum relief valves. The diameter of a vent shall be not less than 2½ inches.

(b) On unmanned tank barges not fitted with fixed bilge systems in the cofferdams and void spaces, vents for cofferdams and void spaces will not be required.

Subpart 32.57—Structural Fire Protection for Tank Vessels Contracted for on or After January 1, 1963

§ 32.57–1 Application—TB/ALL.

(a) The provisions of this subpart shall apply to all tank vessels contracted for on or after January 1, 1963.

§ 32.57–5 Definitions—TB/ALL.

(a) *Standard fire test.* A "standard fire test" is one which develops in the test furnace a series of time temperature relationships as follows:

5 minutes—1,000° F.
10 minutes—1,300° F.
30 minutes—1,550° F.
60 minutes—1,700° F.

(b) *"A" Class divisions.* Bulkheads or decks of the "A" Class shall be composed of steel or equivalent metal construction, suitably stiffened and made intact with the main structure of the vessel; such as shell, structural bulkheads, and decks. They shall be so constructed, that if subjected to the standard fire test, they would be capable of preventing the passage of flame and smoke for one hour.

(c) *"B" Class bulkheads.* Bulkheads of the "B" Class shall be constructed with approved incombustible materials and made intact from deck to deck and to shell or other boundaries. They shall be so constructed that, if subjected to the standard fire test, they would be capable of preventing the passage of flame and smoke for one half hour.

(d) *"C" Class divisions.* Bulkheads or decks of the "C" Class shall be constructed of approved incombustible materials, but need meet no requirements relative to the passage of flame.

(e) *Steel.* Where the term "steel or other equivalent metal" is used in this subpart, it is intended to require a material which, by itself or due to insulation provided, has structural and integrity qualities equivalent to steel at the end of the applicable fire exposure.

(f) *Approved material.* Where in this subpart approved materials are required, they refer to materials approved under the applicable subparts of Subchapter Q (Specifications) of this chapter, as follows:

Deck Coverings	164.006
Structural Insulations	164.007
Bulkhead Panels	164.008
Incombustible Materials	164.009
Interior Finishes	164.012

§ 32.57–10 Construction—TB/ALL.

(a) The hull, superstructure, structural bulkheads, decks, and deckhouses shall be constructed of steel. Alternately, the Commandant may permit the use of other suitable material in special cases, having in mind the risk of fire.

(b) Bulkheads of galleys, paint and lamp lockers, and emergency generator rooms shall be of "A" Class construction.

(c) The boundary bulkheads and decks separating the accommodations and control stations from cargo, and machinery spaces and from galleys, main pantries and storerooms other than small service lockers shall be of "A" Class Construction.

(d) Within the accommodation and service areas (i.e., Galleys, main pantries and storerooms other than small service lockers) the following conditions shall apply:

(1) Corridor bulkheads in accommodation areas shall be of "A" or "B" Class intact from deck to deck. Stateroom doors in such bulkheads may have a louver in the lower half.

(2) Elevator, dumbwaiter, and other trunks shall be of "A" Class construction.

(3) Bulkheads not already specified to be of "A" or "B" Class construction may be of "A", "B", or "C" Class Construction.

(4) The integrity of any deck in way of a stairway opening shall be maintained by means of "A" or "B" Class bulkheads and doors at one level. The doors shall be of the self closing type. Such doors shall be fitted with a suitable kickout panel in the lower half. Holdback hooks, or other means of permanently holding the door open will not be permitted. However, magnetic holdbacks operated from the bridge or from other suitable remote control positions are acceptable.

(5) Interior stairs, including stringers and treads shall be of steel or other suitable material having in mind the risk of fire. This is not intended to preclude the use of other material for nosing, walking surfaces, etc., over the steel.

(6) Except for washrooms and toilet spaces, deck coverings within accommodation spaces shall be of an approved type. However, overlays for leveling or finishing purposes which do not meet the requirements for an approved deck covering may be used in thicknesses not exceeding ⅜ of an inch.

(7) Ceilings, linings, and insulation, including pipe and duct laggins, shall be of approved incombustible material.

(8) Any sheathing, furring or holding pieces incidental to the securing of any bulkhead, ceiling, lining, or insulation shall be of approved incombustible materials.

(9) Combustible veneers, trim, decorations, etc., shall not be used in corridors or hidden spaces. This is not intended

to preclude the use of paint or an approved interior finish.

(e) Wood hatch covers may be used between cargo spaces or between stores spaces. Hatch covers in other locations shall be of steel or equivalent metal construction. Tonnage openings shall be closed by means of steel plates or equivalent metal construction.

(f) Nitrocellulose or other highly inflammable or noxious fume-producing paints or lacquers shall not be used.

Subpart 32.60—Hull Requirements for Tank Vessels Constructed on or After July 1, 1951

§ 32.60–1 Scantlings, material, and workmanship—TB/ALL.

(a) All tank vessels, the construction or conversion of which is started on or after July 1, 1951, shall conform to the requirements in this subpart in construction of hulls. The hull and deckhouses shall be of steel or iron construction except that the pilothouse and decks over quarters may be constructed of wood. Scantlings, material, and workmanship, subdivision of cargo spaces, fitting of cofferdams, and testing of tanks shall be at least equivalent to the requirements of the American Bureau of Shipping or other recognized classification society.

(b) See Subpart 32.57 for structural fire protection requirements for tank vessels contracted for on or after January 1, 1963.

§ 32.60–5 Subdivision of cargo space—TB/ALL.

The cargo space shall be divided into tight compartments as necessary to avoid excessive stresses and to provide stability.

§ 32.60–10 Segregation of cargo; Grade A, B, C, or D—TB/ALL.

(a) *General.* The galleys, living quarters, navigation spaces, general cargo spaces, boiler rooms, and enclosed spaces where sources of vapor ignition are normally present, shall be segregated from cargo tanks by cofferdams or pump rooms or tanks, either empty or used to carry liquid having a flashpoint of 150° F. or above, or deck spaces enclosed or open.

(b) *Cargo tank spaces.* Cargo tank spaces shall extend to the main deck, with hatches and vents located on the weather deck. Liquids having a flash point of not less than 150° F. may be carried in the bulk tanks located beyond the segregating cofferdams and/or pump rooms.

(c) *Enclosed spaces.* (1) Cargo and vent piping passing through enclosed spaces immediately above the bulk cargo tanks shall be continuous except that flanged joints connecting pipe sections will be permitted.

(2) No openings to cargo tank shall be permitted other than stuffing boxes through which valve control rods or permanently installed gage tapes extend and openings for use of tank cleaning machines. Openings for tank cleaning machines, when not in use, shall be kept closed by means of gastight bolted plates and when in use shall be made essentially gas and watertight by covers through which hose or pipe to the tank cleaning machines extend.

(3) The overhead in way of quarters shall be gastight.

(d) *Stowage spaces.* The spaces described in paragraph (c) of this section may be used for stowage purposes and for general cargo provided that adequate ventilation is furnished.

(e) *Openings.* Except as provided in paragraph (c) of this section, there shall be no manholes or other openings from cargo tanks to any other enclosed spaces. Any vents, sounding tubes, and similar piping passing through such tanks shall be run in a suitable trunk.

§ 32.60–15 Segregation of cargo; Grade E—TB/ALL.

(a) *General.* The galleys, living quarters, navigation spaces, general cargo spaces, boilerrooms, and enclosed spaces containing machinery, where sources of vapor ignition are normally present, shall be segregated from the cargo tanks by tight bulkheads and intervening spaces are not required.

(b) *Cargo tank spaces.* Cargo tank spaces can be terminated at any deck with hatches on the same deck, but the vent lines shall be extended to the weather deck. Butterworth openings and extension rods may be located on the tank top.

§ 32.60–20 Pumprooms on tank vessels carrying Grade A, B, C, D and/or E liquid cargo—TB/ALL.

(a) *Cargo pumps.* In tank vessels carrying Grade A, B, C, or D liquid cargo, cargo pumps shall be isolated from source of vapor ignition by gastight bulkheads. A gastight bulkhead between the pumproom and the pump engine room may be pierced for drive shaft and pump engine control rods provided such openings are fitted with stuffing boxes or other approved gland arrangement. A steam driven pump shall not be considered a source of vapor ignition provided the steam temperature does not exceed 500° F.

(b) *Ventilation for pumprooms on tank vessels the construction or conversion of which is started between July 1, 1951, and January 1, 1963.* (1) Pumprooms of all tank vessels, the construction or conversion of which is started between July 1, 1951, and January 1, 1963, shall be ventilated in such a way as to remove vapors from points near the floor level or bilges. Pumprooms on tankships handling Grades A, B, or C liquid cargo, with machinery located below the freeboard deck, shall be equipped with power ventilation. Pumprooms equipped with power ventilation shall have the ventilation outlets terminate more than six feet from any opening to the interior part of the vessel which normally contains sources of vapor ignition.

(2) For all tank vessels, the construction or conversion of which is started between October 1, 1959, and January 1, 1963, the power ventilation shall not produce a source of vapor ignition in either the pumproom or the ventilation systems associated with the pumproom. The capacity of power ventilation units shall be sufficient to effect a complete change of air in not more than 3 minutes, based upon the volume of the pumproom and associated trunks up to the deck at which access from the weather is provided.

(c) *Ventilation for pumprooms on tank vessels the construction or conversion of which is started on or after January 1, 1963.* (1) For all tank vessels, the construction or conversion of which is started on or after January 1, 1963, the cargo pumprooms shall be fitted in accordance with paragraphs (a) and (d) of this section. Cargo pumprooms on these vessels shall be ventilated in such a way as to remove vapors from points near the floor level or bilges. Cargo pumprooms on tank vessels handling Grade A, B, or C liquid cargo, shall be equipped with power ventilation of the exhaust type having capacity sufficient to effect a complete change of air in not more than 3 minutes based upon the volume of the pumproom and associated trunks up to the deck at which access from the weather is provided.

(2) The power ventilation units shall not produce a source of vapor ignition in either the pumproom or the ventilation systems associated with the pumproom. Inlets to exhaust ducts shall be provided and located near the floor level at points where concentrations of vapors may be expected. Ventilation from the weather deck shall be provided. Power supply ventilation may be fitted in lieu of natural ventilation, but when fitted shall be arranged to avoid turbulence in the cargo pumproom. Cargo pumprooms equipped with power ventilation shall have the ventilation outlets terminate more than six feet from any opening to the interior part of the vessel which normally contains sources of vapor ignition, and shall be so located as to minimize the possibility of recirculating contaminated air through the pumproom.

(3) Cargo pumprooms handling Grade D and/or E liquid cargo only shall be fitted with at least two ducts extended to the weather deck, one of which shall be extended to a point near the floor level. This does not preclude installation of power ventilation, if desired.

(d) *Access.* The access to a cargo pumproom in a tank vessel carrying Grade A, B, C, or D liquid cargo shall be from the open deck.

§ 32.60–25 Living quarters—TB/ALL.

(a) For living quarters the partitions and sheathing shall be of an approved fire resistive construction. The specification for incombustible materials is in Subchapter Q (Specifications) of this chapter.

(b) See Subpart 32.57 for structural fire protection for tank vessels contracted for on or after January 1, 1963.

§ 32.60–30 Tank vessels with independent tanks—TB/ALL.

(a) Independent cargo tanks may be located in hold spaces or in other cargo tanks; however, a working space of at

least 15 inches shall be maintained around each independent tank, or else provisions shall be made for moving such tanks to furnish such working space, except that less than 15 inches around such tanks may be permitted if in the judgment of the Officer in Charge, Marine Inspection, having jurisdiction, a satisfactory inspection of the cargo tanks and hull structure can be made.

(b) When an independent cargo tank is located in an enclosed space other than a cargo tank, such enclosed space shall be considered as equivalent to a pumproom and shall be safeguarded as such as required by this subpart.

(c) Cargo tanks independent of the hull structure shall be supported in saddles or on foundations of steel or other suitable material and securely attached in place to preclude the cargo from being damaged or shifting as a result of collision. The arrangement shall be such as to permit longitudinal and circumferential, or athwartship and vertical, expansion of the cargo tanks. Each tank shall be supported so as to prevent the concentration of excessive loads on the supporting portion of the shell.

§ 32.60–35 Tank vessels carrying Grade A liquid cargo—TB/ALL.

Grade A liquids having a Reid vapor pressure in excess of 25 pounds per square inch shall be transported in cargo tanks which are independent of the hull.

§ 32.60–40 Construction and testing of cargo tanks and bulkheads—TB/ALL.

(a) All cargo tanks vented at gage pressure of 4 pounds per square inch or less shall be constructed and tested as required by standards established by the American Bureau of Shipping or other recognized classification society. The design of cargo tanks integral with the hull and vented at a gage pressure exceeding 4 pounds per square inch but not exceeding 10 pounds per square inch gage pressure will be given special consideration by the Commandant.

(b) Cargo tanks vented at a gage pressure exceeding 10 pounds per square inch are considered unfired pressure vessels and shall be of cylindrical or similar design and meet the requirements of Parts 52 through 61 of Subchapter F (Marine Engineering) of this chapter.

§ 32.60–45 Segregation of spaces containing the emergency source of electric power—TB/ALL.

(a) The provisions of this section shall apply to all vessels contracted for on or after October 1, 1958.

(b) When a compartment containing the emergency source of electric power, or vital components thereof, adjoins a space containing either the ship's service generators or machinery necessary for the operation of the ship's service generators, all common bulkheads and/or decks shall be protected by approved "structural insulation" or other approved material. This protection shall be such as to be capable of preventing an excessive temperature rise in the space containing the emergency source of electric power, or vital components thereof, for a period of at least one hour in the event of fire in the adjoining space. Bulkheads or decks meeting Class A–60 requirements, as defined by § 72.05–10 of Subchapter H (Passenger Vessels) of this chapter, will be considered as meeting the requirements of this paragraph.

Subpart 32.63—Hull and Cargo Tank Requirements for Tank Barges Constructed or Converted on or After July 1, 1964, and Carrying Certain Dangerous Bulk Cargoes

§ 32.63–1 Application—B/ALL.

(a) The requirements of this subpart shall apply to all tank barges, the construction or conversion of which is started on or after July 1, 1964, and carrying bulk cargoes as follows:

(1) Flammable liquids having a Reid vapor pressure in excess of 25 pounds per square inch, absolute, in independent tanks (Part 32).

(2) Liquefied flammable gases (Part 38 of this subchapter).

(3) Flammable or combustible liquids having lethal characteristics (Class B or C poisons) (Part 39 of this subchapter).

(4) Certain flammable or combustible dangerous cargoes (Part 40 of this subchapter).

§ 32.63–5 Barge hull classification—B/ALL.

(a) Each barge subject to the provision of this subpart shall be assigned a hull type number. The Commandant will designate the barge hull types to be used for carrying cargoes in order to insure that the vessel is designed consistent with the degree and nature of the hazard of the commodity carried.

(b) For this purpose the barge hull types shall be as follows:

(1) *Type I barge hull.* Barge hulls classed as Type I are those designed to carry products which require the maximum preventive measures to preclude the uncontrolled release of the cargo to the waterways and/or atmosphere.

(2) *Type II barge hull.* Barge hulls classed as Type II are those designed to carry products which require substantial preventive measures to preclude uncontrolled release to the atmosphere, but whose uncontrolled release to the waterways does not constitute a longlasting public or operating personnel hazard, though local and temporary pollution may occur.

(3) *Type III barge hull.* Barge hulls classed as Type III are those designed to carry products of sufficient hazard to require a moderate degree of control.

§ 32.63–8 Alternative arrangements—B/ALL.

(a) Alternative arrangements, differing from those specifically required by this subpart, may be considered and approved by the Commandant, if it is demonstrated to his satisfaction that a degree of safety is obtained which is consistent with the intent of this subpart.

§ 32.63–10 Rakes and coamings—B/ALL.

(a) Each barge hull shall be constructed with a suitable bow form (length, shape, and height of headlog) to protect against diving at the maximum speed at which the barge is designed to be towed. In any integrated tow, only the lead barge need comply with this requirement. In any case, the operator of the towing vessel shall be guided by appropriate speed limitations.

(b) All open hopper type barge hulls shall be provided with coamings around the hopper space and, additionally, a 36-inch minimum height plowshare breakwater on the forward rake. Coamings shall have a minimum height of 36 inches forward graduated to a minimum height of 24 inches at midlength and 18 inches thereafter.

§ 32.63–15 Subdivision and stability—B/ALL.

(a) *General.* In addition to complying with the requirements of § 31.10–30 of this subchapter as applicable, Types I and II barge hulls shall comply with the applicable provisions of this section.

(b) *Types I and II barge hulls.* (1) Types I and II barge hulls shall be constructed with a complete watertight deck, or if of "open hopper type", of such construction that positive buoyancy and stability will be maintained when the barge is fully loaded and the hopper space is flooded to the height of the main deck. Credit may be given for the buoyancy, if any, of the immersed portion of the full cargo tanks when an effective arrangement for securing the tanks is provided.

(2) (i) Type I barge hulls shall retain positive buoyancy and stability after holing the bottom or side shell plating anywhere on its girth, including the intersection of a transverse and a longitudinal watertight bulkhead.

(ii) Type I box barge hulls, specifically designed for operation in an integrated tow, shall retain positive buoyancy and stability after holing the bottom shell plating anywhere on its girth, except in way of a transverse watertight bulkhead, or after holing the side shell plating in way of a transverse watertight bulkhead.

(3) Type II barge hulls shall retain positive buoyancy and stability after holing the bottom or side shell plating anywhere on its girth except in way of a transverse watertight bulkhead.

§ 32.63–20 Hull structure—B/ALL.

(a) *General.* In addition to complying with the requirements of § 32.60–1, as applicable, barge hulls of Types I and II shall comply with the provisions of this section.

(b) *Types I and II barge hull.* Under an assumed grounding condition such that the forward rake bulkhead rests upon a pinnacle at the water surface, the maximum hull bending stress shall not exceed the following limits:

(1) Independent tanks may be installed in such a manner that they do not contribute to the strength and stiff-

ness of the barge. In such case, the hull stress shall not exceed either 50 percent of the minimum ultimate tensile strength of the material or 70 percent of the yield strength when specified, whichever is greater.

(2) The Commandant may consider a reduction in hull stress when independent tanks are installed in such a manner as to contribute to the strength and stiffness of the barge and this is accounted for in determining the effective section modulus of the barge. In such case, the hull stress shall not exceed the percentage stress values prescribed in subparagraph (1) of this paragraph multiplied by the quantity $\left(1.5-\frac{SWT}{UTS}\right)$, where SWT is the stress calculated without including the effect of the tanks, and UTS is the minimum ultimate tensile strength of the material. The value SWT, however, shall in no case be more than 75 percent of UTS.

§ 32.63–25 Cargo tanks and supports—B/ALL.

(a) *General.* Saddles and hold-down securing straps for independent cargo tanks shall be designed to prevent tank failure due to loads induced in the saddles or straps by barge deflection.

(b) *Collision protection.* (1) All independent cargo tanks installed on Type I and Type II barge hulls shall be protected with suitable collision chocks or collision straps to withstand a longitudinal collision load of one and one-half times the weight of the tank and cargo. All other independent cargo tanks shall be provided with suitable collision chocks or collision straps to withstand a longitudinal collision load equal to the weight of the tank and cargo.

(2) All cargo tanks shall be so located as to reduce the likelihood of their being damaged in the event of collision. This protection shall be obtained by locating the cargo tanks not less than 4 feet from the side shell and box-end for Type I hulls and 3 feet for Type II barge hulls, and not less than 25 feet from the headlog at the bow for both types.

(c) *Cargo tank design*—(1) *Types I and II barge hulls.* (i) In addition to requirements provided for in applicable regulations for a specific commodity, cargoes subject to the provisions of this subpart shall be transported in cargo tanks meeting the requirements of this paragraph. Pressure vessel-type cargo tanks shall have sufficient additional strength so as to limit the maximum combined tank stress, including saddle horn and bending stresses, to 1.5 times the maximum allowable hoop stress in still water, and to the yield strength of the tank material or 70 percent of the minimum ultimate tensile strength of the tank material, if less, in the grounded condition as required by § 32.63–20(b).

(ii) Gravity type cargo tanks shall have sufficient additional strength to limit the maximum combined tank stress, including saddle horn and bending stresses, to the yield strength of the tank material or 70 percent of the minimum ultimate tensile strength of the tank material, if less, in the grounded condition as required by § 32.63–20(b).

(2) *Type III barge hulls.* In addition to the requirements of this paragraph, pressure vessel-type cargo tanks shall have sufficient additional strength so as to limit the maximum combined stress, including saddle horn and bending stresses, to 1.5 times the maximum allowable hoop stress.

Subpart 32.65—Hull Requirements for Tank Vessels Constructed on or After November 10, 1936, and Prior to July 1, 1951

§ 32.65–1 Application—TB/ALL.

The requirements in this subpart apply to all tank vessels, the construction or conversion of which was started on or after November 10, 1936, and prior to July 1, 1951.

§ 32.65–5 Scantlings, material, and workmanship—TB/ALL.

The hull and deck houses shall be of steel or iron construction except that the pilothouse and decks over quarters may be constructed of wood. Scantlings, material, and workmanship, subdivision of cargo spaces, fitting of cofferdams, and testing of tanks shall be at least equivalent to the requirements of the American Bureau of Shipping or other recognized classification society.

§ 32.65–10 Subdivision of cargo space—TB/ALL.

The cargo space shall be divided into tight compartments as necessary to avoid excessive stresses and to provide stability.

§ 32.65–15 Cofferdams—TB/ALL.

Tank vessels equipped to carry Grade A, B, C, or D liquids shall have their galleys, living quarters, general cargo spaces, boiler rooms, and enclosed spaces containing propelling machinery or other machinery where sources of vapor ignition are normally present, segregated from their cargo tanks by cofferdams or equivalent pumprooms, tanks, or air spaces.

§ 32.65–20 Pumprooms—TB/ALL.

(a) Tank vessels handling Grade A, B, C, or D liquids shall have their cargo pumps isolated from all sources of vapor ignition by gastight bulkheads. Totally enclosed motors of the "explosion proof" type, motors ventilated on both the intake and exhaust by ducts to atmosphere, and engines driven by steam shall not be considered to be sources of vapor ignition. The gastight bulkhead between the pumproom and the pump-engine compartment may be pierced by fixed lights, drive shaft and pump-engine control rods, provided that the shafts and rods are fitted with stuffing boxes where they pass through the gastight bulkheads. The access to a cargo pumproom handling such liquids shall be from the open deck. (See § 32.60–20.)

§ 32.65–25 Living quarters—TB/ALL.

Partitions and sheathing shall be of approved fire-resistive construction.

§ 32.65–30 Tank vessels with independent tanks—TB/ALL.

Independent cargo tanks may be located in hold spaces or in other cargo tanks but in all cases a working space of at least 15 inches shall be provided around such independent tanks, or else provisions shall be made for moving them to secure such space. When independent cargo tanks are located in an enclosed space other than a cargo tank, such enclosed space shall be considered as equivalent to a pumproom, and shall be safeguarded as such, as required in the regulations in this subchapter.

§ 32.65–35 Tank vessels carrying Grade A liquids—TB/ALL.

Cargo tanks for Grade A liquids having a Reid vapor pressure in excess of 25 pounds shall be independent of the hull.

§ 32.65–40 Construction and testing of cargo tanks and bulkheads—TB/ALL.

(a) All cargo tanks to be vented at gage pressures of 4 pounds per square inch or less shall be constructed and tested as required by the requirements of the American Bureau of Shipping or other recognized classification society.

(b) All cargo tanks to be vented at gage pressures above 4 pounds per square inch shall be considered as unfired pressure vessels and shall meet the requirements for such vessels as to construction and testing, as set forth in Parts 52 to 57, inclusive, of Subchapter F (Marine Engineering) of this chapter.

(c) Gastight bulkheads shall be subjected to a thorough hose test.

Subpart 32.70—Hull Requirements for Steel Hull Tank Vessels Constructed Prior to November 10, 1936

§ 32.70–1 Application—TB/ALL.

All steel hull tank vessels, the construction or conversion of which was started prior to November 10, 1936, shall conform to the requirements in this subpart.

§ 32.70–5 Hull requirements; general—TB/ALL.

The scantlings, material, and workmanship, the subdivision of cargo spaces, the arrangement of cofferdams, the testing of tanks and cofferdams, shall be at least equivalent to the requirements of a recognized classification society for the particular service specified in the application for the certificate of inspection and permit for the transportation of liquid inflammable cargoes in bulk as of the date when the tank vessel was built or as of the date when the vessel was converted into a tank vessel. In the absence of such classification requirements, the Officer in Charge, Marine Inspection, shall satisfy himself that the vessel's structure as specified in this section is safe for the service to be specified in its certificate of inspection.

§ 32.70–10 Cofferdams—TB/ALL.

Tank vessels carrying Grade A, B, or C liquids shall be required to conform to

the construction requirements in regard to vertical cofferdams in § 32.65–15, except that a dry cargo compartment shall be considered to be equivalent to a cofferdam, and except as provided for in § 32.70–20.

§ 32.70–15 Pumprooms—TB/ALL.

Tank vessels handling Grade A, B, C or D liquid cargo shall meet the requirements for tank vessels in § 32.65–20 except that the electrical installation shall comply with the requirements of § 32.45–10(c).

§ 32.70–20 Pump-engine compartment—TB/ALL.

No cofferdam will be required between a cargo tank and a compartment containing pumping engines and their auxiliaries which are used exclusively during pumping operations, provided the pumping engine compartment contains no cargo valves and is well ventilated and provided further that internal combustion exhaust within the compartment are completely water jacketed or insulated and that gasoline engine intakes are fitted with effective flame arresters.

§ 32.70–25 Cargo tanks—TB/ALL.

Cargo tanks shall comply with the conditions specified in §§ 32.65–30 and 32.65–35, and shall pass the tests required in § 32.65–40: *Provided, however,* That less than 15 inches around such tanks may be accepted if in the judgment of the Officer in Charge, Marine Inspection, making the inspection, a satisfactory inspection of the cargo tanks and hull structure can be made.

Subpart 32.75—Hull Requirements for Wood Hull Tank Vessels Constructed Prior to November 10, 1936

§ 32.75–1 Application—TB/ALL.

All wood hull tank vessels, the construction or conversion of which was started prior to November 10, 1936, shall conform to the requirements in this subpart.

§ 32.75–5 Hull requirements; general—TB/ALL.

The scantlings, material, and workmanship, and the fitting and fastening of parts shall be at least equivalent to the requirements of a recognized classification society for the particular service specified in the application for certificate of inspection and permit for the transportation of liquid flammable cargoes in bulk as of the date when the tank vessel was built, or as of the date when the vessel was converted into a tank vessel. In the absence of such classification requirements, the Officer in Charge, Marine Inspection, shall satisfy himself that the vessel's structure as specified in this section is safe for the service to be specified in its certificate of inspection.

§ 32.75–10 Cargo tanks—TB/ALL.

Cargo tanks shall be independent of the wood hull, shall be made of steel or iron, and shall pass the tests required in § 32.65–40 (a), (b). Where cargo tanks in wood hulls are not arranged to provide working space around them they shall be so constructed as to allow inspection of the hull, tanks, and bilges, and they shall be so installed that they can be moved to allow repairs to the hull structure and to themselves.

§ 32.75–15 Electric bonding and grounding for tanks—TB/ALL.

All independent cargo tanks in wood hull tank vessels shall be electrically bonded together with stranded copper cable of not less than No. 4 B and S gage and one end of this cable shall be grounded to a copper or brass plate of not less than 2 square feet in area and one-sixteenth inch in thickness and this plate shall be securely fastened to the hull, on the outside, at a point where it shall be covered by water when the tank vessel is unloaded.

§ 32.75–20 Hold spaces and bulkheads—TB/ALL.

In wood hull tank vessels containing independent cargo tanks for the transportation of Grade A, B, C, or D liquids, the hold spaces shall be considered as equivalent to a pumproom and shall be safeguarded and ventilated as such as required by § 32.65–20. Where the hold spaces contain equipment or operations which are sources of vapor ignition, such equipment or operations shall be isolated from other spaces by gastight bulkhead or, if it is impracticable to construct a gastight bulkhead, two structurally tight bulkheads without openings, separated by a well-ventilated air space 24 inches wide, where possible may be used.

Subpart 32.80—Tank Barges Constructed of Materials Other Than Steel or Iron

§ 32.80–1 General requirements—B/ALL.

All tank barges with hulls constructed of materials other than iron or steel, the construction or conversion of which was started prior to September 2, 1945, and to which certificates of inspection were issued prior to March 2, 1946, shall be considered the same as tank barges constructed prior to November 10, 1936.

Subpart 32.85—Lamp and Paint Rooms and Similar Compartments on Tankships

§ 32.85–1 Fireproofing of lamp, oil and paint rooms—T/ALL.

Lamp, oil and paint rooms shall be wholly and tightly lined with metal.

PART 33—LIFESAVING APPLIANCES

Subpart 33.01—General Lifesaving Requirements

Sec.
- 33.01–1 Inspection of lifesaving appliances—TB/ALL.
- 33.01–5 Construction of lifesaving equipment—TB/ALL.
- 33.01–15 Responsibility of master regarding lifesaving equipment—TB/ALL.
- 33.01–20 Approval for repairs and alterations—TB/ALL.
- 33.01–25 Factory inspection of lifesaving equipment—TB/ALL.
- 33.01–27 Weight test of lifeboat installation—T/ALL.
- 33.01–30 Approval of lifesaving appliances—TB/ALL.
- 33.01–35 Magazine chests for pyrotechnic equipment—T/ALL.

Subpart 33.05—Lifeboats, Liferafts, and Buoyant Apparatus Required

- 33.05–1 Lifeboats and liferafts for tankships; ocean and coastwise; construction or conversion of which was started prior to November 19, 1952—T/OC.
- 33.05–2 Lifeboats and liferafts for tankships; ocean and coastwise; construction or conversion of which was started on or after November 19, 1952, and prior to May 26, 1965—T/OC.
- 33.05–3 Lifeboats and liferafts for tankships; ocean and coastwise; construction or conversion of which started on or after May 26, 1965—T/OC.
- 33.05–5 Lifeboats for barges; ocean—B/O.
- 33.05–15 Lifeboats for barges; coastwise—B/C.
- 33.05–20 Lifeboats and liferafts for tank vessels; Great Lakes—TB/L.
- 33.05–25 Lifeboats, liferafts, or buoyant apparatus for tank vessels; bays, sounds, lakes other than Great Lakes, and rivers—TB/BR.
- 33.05–30 Equipment for tank vessels on short voyages beyond certificated waters—TB/LB.
- 33.05–35 Wooden lifeboats prohibited on tank vessels—TB/ALL.

Subpart 33.07—Substitution of Inflatable Liferafts for Other Liferafts, Lifefloats, and Buoyant Apparatus on Certain Vessels Not on an International Voyage

- 33.07–1 Inflatable liferafts on barges—B/ALL.
- 33.07–5 Inflatable liferafts for other liferafts, lifefloats, and buoyant apparatus—T/ALL.
- 33.07–10 Inflatable liferafts for lifeboats on tankships under 500 gross tons—T/ALL.
- 33.07–15 Inflatable liferafts for lifeboats on certain tankships of 500 to 1,600 gross tons—T/ALL.
- 33.07–20 Inflatable liferafts for lifeboats on certain tankships of 1,600 to 3,000 gross tons—T/ALL.
- 33.07–25 Inflatable liferafts for lifeboats on certain tankships of 3,000 gross tons and upward—T/ALL.

Subpart 33.10—Lifeboat Handling Equipment Requirements

- 33.10–1 Lifeboat davits—TB/ALL.
- 33.10–5 Lifeboat winches—TB/ALL.
- 33.10–10 Blocks and falls—TB/ALL.
- 33.10–15 Disengaging apparatus—T/OCL.
- 33.10–20 Disengaging apparatus—T/BR and B/ALL.

Subpart 33.15—Equipment for Lifeboats, Liferafts, or Buoyant Apparatus

- 33.15–1 Lifeboat, liferaft or buoyant apparatus equipment; general—TB/ALL.
- 33.15–5 Required equipment for lifeboats—TB/ALL.
- 33.15–10 Description of equipment for lifeboats—TB/ALL.
- 33.15–15 Required equipment for rigid type liferafts and buoyant apparatus—TB/LBR.
- 33.15–16 Required equipment for inflatable liferafts—TB/ALL.
- 33.15–20 Description of equipment for life rafts and buoyant apparatus—TB/LBR.
- 33.15–25 Portable radiotelegraph apparatus—T/OC.

Sec.
33.15-90 Lifeboat, liferaft and buoyant apparatus equipment on tank vessels contracted for prior to May 26, 1965—TB/ALL.

Subpart 33.20—Stowage of Lifeboats, Liferafts, and Buoyant Apparatus

33.20-1 Davits and launching devices—TB/ALL.
33.20-3 Embarkation aids into inflatable liferafts—T/ALL.
33.20-5 Lifeboat davit falls—T/ALL.
33.20-10 Lifeboats and liferafts kept clear for launching—TB/ALL.
33.20-15 Stowage of lifeboats and liferafts—TB/ALL.

Subpart 33.25—Markings, Care, and Inspection

33.25-5 Numbering and marking of lifeboats—TB/ALL.
33.25-10 Marking of liferafts—TB/ALL.
33.25-15 Overhaul—TB/ALL.
33.25-20 Maintenance—TB/ALL.

Subpart 33.30—Manning of Lifeboats and Liferafts

33.30-1 Persons in charge of each lifeboat and liferaft—T/O.
33.30-3 Person in charge of each lifeboat or liferaft—T/CLB.
33.30-5 Manning of lifeboats and liferafts—TB/OCLB.

Subpart 33.35—Life Preservers

33.35-1 Number and type required—TB/ALL.
33.35-5 Distribution and stowage—TB/ALL.
33.35-10 Shipboard inspections—TB/ALL.
33.35-15 Requirements for life preservers—TB/ALL.

Subpart 33.40—Ring Life Buoys and Water Lights

33.40-1 Ring life buoys and water lights, general requirements—TB/ALL.
33.40-5 Number required on tankships—T/ALL.
33.40-10 Number required on tank barges—B/ALL.
33.40-15 Distribution and security—TB/ALL.

Subpart 33.45—Distress Signals

33.45-1 Distress signals—T/ALL and B/OC.
33.45-5 Parachute distress signals—T/OC.
33.45-10 Stowage of distress signals—TB/ALL.

Subpart 33.50—Signaling Lamp

33.50-1 Signaling lamp—T/O.

Subpart 33.55—Line-Throwing Appliances

33.55-1 Line-throwing appliances required—T/OC.
33.55-5 Accessibility—T/OC.
33.55-10 Equipment for line-throwing appliances—T/OC.
33.55-15 Service recommendations—T/OC.

AUTHORITY: The provisions of this Part 33 issued under R.S. 4405, as amended, 4417a, as amended, 4462, as amended; 46 U.S.C. 375, 391a, 416. Interpret or apply R.S. 4488, as amended, sec. 3, 68 Stat. 675; 46 U.S.C. 481, 50 U.S.C. 198; E.O. 11239, July 31, 1965, 30 F.R. 9671, 3 CFR, 1965 Supp. Treasury Department Orders 120, July 31, 1950, 15 F.R. 6521; 167-14, Nov. 26, 1954, 19 F.R. 8026; 167-38, Oct. 26, 1959, 24 F.R. 8857, unless otherwise noted.

Subpart 33.01—General Lifesaving Requirements

§ 33.01-1 Inspection of lifesaving appliances—TB/ALL.

At each inspection for certification and at any other time as required by the Officer in Charge, Marine Inspection, all lifesaving appliances on a tank vessel shall be inspected.

§ 33.01-5 Construction of lifesaving equipment—TB/ALL.

All tank vessels subject to the regulations in this subchapter shall have lifeboats, disengaging apparatus, liferafts, life preservers, and all other lifesaving apparatus constructed in accordance with the regulations contained in the applicable subparts of Subchapter Q (Specifications) of this chapter: *Provided, however,* That all lifesaving apparatus which is of the character that complied with the rules and regulations of the Commandant, on vessels in existence at the time that the regulations in this subchapter are promulgated and have been in use on such vessels, may be continued in use so long as such existing lifesaving equipment and apparatus are found to be in good and workable condition. Where lifesaving equipment and apparatus are not found to be in good and workable condition, they shall be repaired or else replaced by lifesaving equipment and apparatus of the latest approved type, as required by the regulations in this subchapter and Subchapter Q (Specifications) of this chapter. Where lifesaving equipment and apparatus are found to be in good and workable condition but deficient as to quantity or numbers, the additional quantity or numbers required by the regulations in this subchapter shall be of the latest approved type.

§ 33.01-15 Responsibility of master regarding lifesaving equipment—TB/ALL.

It shall be the duty of the master or person in charge to see that the lifeboats, liferafts, davits, falls, life preservers, and other lifesaving appliances are at all times ready for use, and that all equipment for his vessel required by the regulations in this subchapter are provided, maintained, and replaced as indicated.

§ 33.01-20 Approval for repairs and alterations—TB/ALL.

No extensive repairs or alterations, except in emergency, shall be made to any lifeboat, lifeboat disengaging apparatus, life preserver, liferaft, or other appliance subject to inspection, without advance notice to the Officer in Charge, Marine Inspection. Such repairs and alterations shall so far as is practicable be made with materials and tested in the manner specified in this subchapter and applicable requirements in Subchapter Q (Specifications) of this chapter for new construction. Emergency repairs or alterations shall be reported as soon as practicable to the Officer in Charge, Marine Inspection, where the vessel may call after such repairs are made; nor shall any lifeboat or liferaft be reconditioned or used on a tank vessel other than that for which it was built, without notice to and supervision by the Officer in Charge, Marine Inspection, where such reconditioning or repairs are to be made.

§ 33.01-25 Factory inspection of lifesaving equipment—TB/ALL.

The Coast Guard District Commander where lifesaving apparatus is built shall detail an inspector to any place where lifeboats, liferafts, or buoyant apparatus are being built, who will inspect and examine carefully their construction and he shall satisfy himself that such lifeboats, liferafts, or buoyant apparatus are constructed in accordance with the drawings, or blueprints, and specifications furnished by the builders to the Coast Guard. When the inspector approves the construction of the lifeboat, life raft, or buoyant apparatus, he will stamp his initials, together with the letters "U.S.C.G." on a blank space on the plate required to be affixed to the unit by the builder. The initials of the inspector shall be satisfactory evidence to all parties interested that the unit has been constructed in accordance with the drawings, or blueprints, and specifications on file with the Coast Guard.

§ 33.01-27 Weight test of lifeboat installation—T/ALL.

(a) The following test shall be made at least once in each two-year period. If practicable, it shall be made at the inspection for certification or at a reinspection.

(b) Each lifeboat shall be lowered to near the water and then be loaded with its allowed capacity, evenly distributed throughout the length, and then be lowered into the water until it is afloat, and be released from the falls. In making this test, persons or dead weight may be used. The total weight used shall be at least equal to the allowed capacity of the lifeboat considering persons to weigh 165 pounds each.

§ 33.01-30 Approval of lifesaving appliances—TB/ALL.

(a) Any type of lifeboat or liferaft approved by the Commandant shall be considered as equivalent to the standard lifeboat or liferaft.

(b) Lifeboats shall be of an approved type and constructed in accordance with Subpart 160.035 of Subchapter Q (Specifications) of this chapter.

(c) A Class 1 motor lifeboat is one that is fitted with a compression-ignition engine, is capable of being readily started in all conditions, and has sufficient fuel for 24 hours continuous operation. The speed ahead in smooth water when loaded with its full complement of persons and equipment shall be at least 6 knots.

(d) Rigid type liferafts shall be of an approved type and constructed in accordance with Subpart 160.018 of Subchapter Q (Specifications) of this chapter.

(e) Buoyant apparatus shall be of an approved type and constructed in accordance with Subpart 160.010 of Subchapter Q (Specifications) of this chapter.

(f) Inflatable liferafts shall be of an approved type constructed in accordance with Subpart 160.051 of Subchapter Q (Specifications) of this chapter. On tankships on an international voyage, each inflatable liferaft shall have a car-

rying capacity of not less than 6 nor more than 25 persons.

(g) In general, a suitable rescue boat shall be a small lightweight boat of rigid construction, with built-in buoyancy and capable of being readily launched and easily maneuvered. Also it shall be of adequate proportion to permit taking an unconscious person on board without capsizing. A rescue boat and its installation shall be acceptable to the Officer in Charge, Marine Inspection, as suitable for the rescue of persons accidentally falling over the side, or for similar emergency purposes. The size, shape, installation, and other factors of suitability will be determined with due consideration of the size, arrangement, intended service and crew requirements of the vessel on which it is to be installed.

(R.S. 4491, as amended; 46 U.S.C. 489)

§ 33.01–35 Magazine chests for pyrotechnic equipment—T/ALL.

Tank ships required to carry pyrotechnic distress signals or line-throwing appliances shall be provided with a portable magazine chest. (See Subpart 160.038, portable magazine chests, of Subchapter Q (Specifications) of this chapter.) Magazine chests shall be secured above the freeboard deck away from heat. Stowage in enclosed spaces or adjacent to cargo tanks is prohibited.

Subpart 33.05—Lifeboats, Liferafts, and Buoyant Apparatus Required

§ 33.05–1 Lifeboats and liferafts for tankships; ocean and coastwise; construction or conversion of which was started prior to November 19, 1952—T/OC.

(a) All tankships shall carry a sufficient number of lifeboats on each side to accommodate all persons on board: *Provided*, That such tankships of 350 feet in length or over in ocean service, having superstructure amidships and propelling machinery aft shall be provided with at least four lifeboats, one on each side in way of the after accommodations, and one on each side in way of amidship accommodations.

(b) No lifeboat shall be of less than 180 cubic feet measurement, except, in the case of coastwise vessels, if specifically approved by the Commandant.

(c) All tankships of 1,600 gross tons and over on an international voyage shall carry at least one Class 1 motor lifeboat on each side. The requirement of this paragraph shall not apply except for replacements, and then only if it can be done without change to existing davits, winches, and arrangements.

(d) Inflatable liferafts may be substituted for lifeboats on certain vessels not on an international voyage in accordance with Subpart 33.07.

(e) All tankships in ocean service, and all tankships of less than 1,600 gross tons on an international voyage shall carry inflatable liferafts of sufficient capacity to accommodate at least 50 percent of the persons on board. Those tankships having widely separated accommodation and/or working spaces shall have at least one liferaft in each such location.

§ 33.05–2 Lifeboats and liferafts for tankships; ocean and coastwise; construction or conversion of which was started on or after November 19, 1952 and prior to May 26, 1965—T/OC.

(a) All tankships shall carry a sufficient number of lifeboats on each side to accommodate all persons on board: *Provided*, That such tankships of 3,000 gross tons and over, having a superstructure amidships and propelling machinery aft shall be provided with at least four lifeboats, one on each side in way of the after accommodations, and one on each side in way of amidship accommodations.

(b) No lifeboat shall be less than 24 feet in length, except where owing to the size of the tankship, or for other reasons, the Commandant may permit smaller lifeboats, but in no case shall they be less than 16 feet in length.

(c) All tankships of 1,600 gross tons and over on an international voyage shall carry at least one Class 1 motor lifeboat on each side. The requirement of this paragraph shall not apply except for replacements, and then only if it can be done without change to existing davits, winches, and arrangements.

(d) Inflatable liferafts may be substituted for lifeboats on certain vessels not on an international voyage in accordance with Subpart 33.07.

(e) All tankships in ocean service, and all tankships of less than 1,600 gross tons on an international voyage shall carry inflatable liferafts of sufficient capacity to accommodate at least 50 percent of the persons on board. Those tankships having widely separated accommodation and/or working spaces shall have at least one liferaft in each such location.

§ 33.05–3 Lifeboats and liferafts for tankships; ocean and coastwise; construction or conversion of which started on or after May 26, 1965—T/OC.

(a) All ocean and coastwise tankships shall carry a sufficient number of lifeboats on each side to accommodate all persons on board.

(b) All tankships of 3,000 gross tons and over on an international voyage shall carry not less than four lifeboats. Two lifeboats shall be carried aft and two amidships except that in tankships which have no amidships superstructure all lifeboats shall be carried aft: *Provided*, That, if in the case of tankships with no amidships superstructure it is impracticable to carry four lifeboats aft, the Commandant may permit instead the carriage aft of one lifeboat on each side of the ship. In such cases:

(1) Each lifeboat shall not exceed 26 feet in length;

(2) Each lifeboat shall be stowed as far forward as practicable, but at least so far forward that the after end of the lifeboat is 1½ times the length of the lifeboat forward of the propeller; and

(3) Each lifeboat shall be stowed as near the sea level as is safe and practicable.

(c) No lifeboat shall be less than 24 feet in length, except where owing to the size of the tankship, or for other reasons, the Commandant may permit smaller lifeboats, but in no case shall they be less than 16 feet in length.

(d) All tankships 1,600 gross tons and over on an international voyage shall carry on each side at least one Class 1 motor lifeboat.

(e) All tankships certificated for ocean service, and all tankships of less than 1,600 gross tons on an international voyage shall carry inflatable liferafts of sufficient capacity to accommodate at least 50 percent of the persons on board. Those tankships having widely separated accommodation and/or working spaces shall have at least one liferaft in each such location.

(f) Inflatable liferafts may be substituted for lifeboats on certain vessels not on an international voyage in accordance with Subpart 33.07.

§ 33.05–5 Lifeboats for barges; ocean—B/O.

(a) All tank barges which normally operate more than 20 miles offshore shall carry a sufficient number of lifeboats to accommodate all persons on board.

(b) No lifeboat shall be of less than 125 cubic feet measurement.

(c) Inflatable liferafts may be substituted for lifeboats on certain vessels in accordance with Subpart 33.07.

§ 33.05–15 Lifeboats for barges; coastwise—B/C.

(a) All tank barges which normally operate 20 miles or less offshore shall carry a sufficient number of lifeboats to accommodate all persons on board.

(b) No lifeboat on a tank barge of 100 gross tons or over shall be of less than 125 cubic feet measurement, except by approval of the Commandant. No lifeboat on a tank barge of less than 100 gross tons shall be of less than 90 cubic feet measurement, except by approval of the Commandant.

(c) Inflatable liferafts may be substituted for lifeboats on certain vessels in accordance with Subpart 33.07.

§ 33.05–20 Lifeboats and liferafts for tank vessels; Great Lakes—TB/L.

(a) All tank vessels operating on the waters of the Great Lakes shall carry a sufficient number of lifeboats to accommodate all persons on board.

(b) No lifeboat on a tank vessel of 100 gross tons or over shall be of less than 90 cubic feet measurement, except by approval of the Commandant. No lifeboat on a tank vessel of less than 100 gross tons shall be of less than 60 cubic feet measurement.

(c) All tankships of 300 gross tons and over, operating on the waters of the Great Lakes, shall carry in addition to their lifeboat equipment, one approved and fully equipped liferaft of suitable size, with one electric water light; the raft to be stowed in a manner to allow same to float clear in the event of sinking of the vessel: *Provided, however*, That all tankships of 300 gross tons or over operating on the waters of the Great Lakes which are equipped with lifeboats in accordance with § 33.05–1 or § 35.05–10 shall be exempt from this requirement. The electric water light need not be attached to the raft, but when the electric

water light is not attached to the raft, a snap hook shall be provided for this purpose.

(d) Inflatable liferafts may be substituted for lifeboats and liferafts on certain vessels in accordance with Subpart 33.07.

§ 33.05–25 Lifeboats, liferafts, or buoyant apparatus for tank vessels; bays, sounds, lakes other than Great Lakes, and rivers—TB/BR.

(a) All tank vessels, except those on an international voyage, operating exclusively on bays, sounds, lakes (other than the Great Lakes), rivers, harbors, or inland waters tributary to the Gulf of Mexico, shall carry lifeboats, liferafts, or buoyant apparatus of sufficient number to accommodate all persons on board.

(b) No lifeboat shall be of less than 60 cubic feet measurement.

(c) The minimum size of any piece of buoyant apparatus shall be such as to accommodate at least five persons.

(d) Inflatable liferafts may be substituted for lifeboats, liferafts and buoyant apparatus on certain vessels in accordance with Subpart 33.07.

(e) All tankships on an international voyage shall meet the applicable requirements of §§ 33.05–1 through 33.05–3.

§ 33.05–30 Equipment for tank vessels on short voyages beyond certificated waters—TB/LB.

(a) The Officer in Charge, Marine Inspection, may issue permits to tank vessels of less than 100 gross tons which are certificated for lake, bay, and sound routes, to engage on short voyages to points beyond such waters, but not more than 15 miles from port of refuge: *Provided*, That such vessels are equipped with a sufficient number of lifeboats, liferafts, or buoyant apparatus to accommodate all persons on board.

(b) No lifeboat shall be of less than 60 cubic feet measurement. The minimum size of any liferaft or piece of buoyant apparatus shall be such as to accommodate at least five persons.

(c) Inflatable liferafts may be substituted for lifeboats, liferafts and buoyant apparatus on certain vessels in accordance with Subpart 33.07.

§ 33.05–35 Wooden lifeboats prohibited on tank vessels—TB/ALL.

Lifeboats installed on tank vessels after September 1, 1943, shall be constructed of metal or other material approved by the Commandant. Internals, such as buoyancy tanks, water tanks, and provision and equipment lockers may be constructed of suitable materials other than metal which have been approved by the Commandant.

Subpart 33.07—Substitution of Inflatable Liferafts for Other Liferafts, Lifefloats, and Buoyant Apparatus on Certain Vessels Not On an International Voyage

§ 33.07–1 Inflatable liferafts on barges—B/ALL.

(a) On all tank barges inflatable liferafts may be substituted for lifeboats, other types of liferafts, lifefloats, and buoyant apparatus wherever they may be required.

(b) The capacity of inflatable rafts carried in place of other liferafts, lifefloats, and buoyant apparatus shall be sufficient to accommodate all persons on board.

(c) The substitution of inflatable liferafts shall not be made without prior approval of the Officer in Charge, Marine Inspection.

§ 33.07–5 Inflatable liferafts for other liferafts, lifefloats and buoyant apparatus—T/ALL.

(a) On all tankships inflatable liferafts may be permitted as substitutes for other types of liferafts, lifefloats and buoyant apparatus required by this subpart.

(b) The capacity of inflatable liferafts carried in place of other type liferafts, lifefloats and buoyant apparatus shall be at least equivalent to that required of equipment for which substitution is made.

(c) The substitution of inflatable liferafts shall not be made without prior approval of the Officer in Charge, Marine Inspection.

§ 33.07–10 Inflatable liferafts for lifeboats on tankships under 500 gross tons—T/ALL.

(a) On all tankships under 500 gross tons, inflatable liferafts may be substituted for all required lifeboats.

(b) The total capacity of the inflatable liferafts shall be at least equal to the total number of persons that the lifeboats would have been required to accommodate. Partial substitution is permissible provided the aggregate lifeboat and inflatable liferaft capacity is sufficient to accommodate the required number of persons carried.

(c) Where substitution of inflatable liferafts is made, a suitable rescue boat shall be provided. In the case of partial substitution, a lifeboat may serve as the rescue boat.

(d) The substitution of inflatable liferafts for lifeboats shall not be made without prior approval of the Officer in Charge, Marine Inspection.

§ 33.07–15 Inflatable liferafts for lifeboats on certain tankships of 500 to 1,600 gross tons—T/ALL.

(a) On all tankships of 500 gross tons and upwards to 1,600 gross tons inflatable liferafts may be substituted for all required lifeboats provided one approved lifeboat of a size acceptable to the Officer in Charge, Marine Inspection, suitable for rescue purposes, is installed.

(b) The aggregate lifeboat and inflatable liferaft capacity shall be at least equal to the total number of persons that the lifeboats would have been required to accommodate.

(c) The launching arrangement and location of the lifeboat to be used as rescue boat shall be such that it can be readily launched and shall be to the satisfaction of the Officer in Charge, Marine Inspection.

(d) The substitution of inflatable liferafts for lifeboats shall not be made without prior approval of the Officer in Charge, Marine Inspection.

§ 33.07–20 Inflatable liferafts for lifeboats on certain tankships of 1,600 to 3,000 gross tons—T/ALL.

(a) On all tankships of 1,600 gross tons and upwards to 3,000 gross tons inflatable liferafts may be substituted for all except two of the required lifeboats. These lifeboats shall be of a size acceptable to the Officer in Charge, Marine Inspection, and shall be suitable for rescue purposes. In all cases, two approved lifeboats, one on each side, shall be provided.

(b) The aggregate lifeboat and inflatable liferaft capacity shall be at least equal to the total number of persons that the lifeboats, for which substitutions are made plus those remaining on board, would have been required to accommodate.

(c) The substitution of inflatable liferafts for lifeboats shall not be made without prior approval of the Officer in Charge, Marine Inspection.

§ 33.07–25 Inflatable liferafts for lifeboats on certain tankships of 3,000 gross tons and upward—T/ALL.

(a) The Commandant may give special consideration to the substitution of approved inflatable liferafts for required lifeboats on tankships of 3,000 gross tons and over.

Subpart 33.10—Lifeboat Handling Equipment Requirements

§ 33.10–1 Lifeboat davits—TB/ALL.

(a) No type or make of mechanical or gravity davit shall be used unless it has first been approved by the Commandant. For construction of davits see Subpart 160.032 of Subchapter Q (Specifications) of this chapter.

(b) On any tank vessel the keel of which was laid after September 1, 1941, davits for lifeboats weighing in excess of 5,000 pounds when fully equipped (but without persons) shall be of the gravity type.

(c) On tank vessels of 1,600 gross tons and over on an international voyage, contracted for on or after May 26, 1965, all davits shall be of the gravity type.

(d) No davit arm or frame comprising mechanical or gravity davits shall be placed on board any vessel until all the requirements of this section and Subpart 160.032 of Subchapter Q (Specifications) of this chapter have been met.

(e) Whenever mechanical or gravity davits or parts of davits, such as davit arms, or frames, are installed on vessels, to take the place of davits, davit arms, or frames which have been damaged or broken, such davits or frames shall have the manufacturer's nameplate affixed thereto.

§ 33.10–5 Lifeboat winches—TB/ALL.

(a) When lifeboat winches are installed on tank vessels, wire falls shall be provided for each set of davits.

(b) On tankships of 500 gross tons and over in ocean or coastwise service, construction or conversion of which is started on or after November 19, 1952, lifeboat winches shall be provided for all lifeboats, where the deck on which the lifeboats are carried exceeds 20 feet from the lightest seagoing draft.

(c) Lifeboat winches proposed for use in new installations shall be of an approved type and constructed in accordance with Subpart 160.015 of Subchapter Q (Specifications) of this chapter.

(d) Suitable fabric covers shall be provided, so fitted over exposed mechanisms that ice formations may be readily broken adrift when necessary to operate the lifeboat winch.

(e) Installation: Lifeboat winches shall be so located that the operator can observe the movement of the lifeboat during the lowering operation. The lead of the falls to the lifeboat winch shall be in accordance with § 33.10–10 (g).

(f) Tests: Upon completion of the installation of all lifeboat winches, and before the vessel is certificated for service, the following tests and examinations shall be made in the presence of an inspector:

(1) Swing lifeboat out from chocks and lower to level for loading, at which point the lifeboat shall be loaded with dead weight equivalent tc the number of persons allowed (165 pounds per person) together with weight of equipment, plus 10 percent of the total load. The lifeboat should then be lowered to the water, stopping at approximately 6-foot intervals by action of the counterweight alone. During the test the following observations should be made:

(i) Brake action shall be smooth, but positive. Brakes exposed to the weather shall also be tested under the load lowering condition with the braking surface wetted.

(ii) Counterweight shall be capable of stopping and holding the lifeboat when released.

(iii) The lifeboat winch shall be capable of controlling the speed of lowering of the fully equipped lifeboat with its complement of persons on board to not more than 120 feet per minute. In addition, the speed of lowering of the fully equipped lifeboat without its complement of persons shall be not less than 40 feet per minute.

(iv) No part of lowering gear shall show any distress under load.

(v) Deck under lifeboat winch and davits must be of sufficient strength to prevent any undue stress of the deck under load.

(vi) Mechanical davits shall swing to extreme outboard position without slacking the lifeboat winch brake.

(vii) Action of governor brake and lowering speed permitted by same should be noted.

(viii) Determine that falls are of sufficient length to lower to light load line with vessel listed 15 degrees either way.

(2) A report of the results of the installation test covering all the above points shall be recorded.

§ 33.10–10 Blocks and falls for lifeboats—TB/ALL.

Blocks and falls installed after May 1, 1942, shall conform to the following requirements:

(a) All blocks, falls, fairleads, padeyes, fastenings, etc., used in connection with lifeboat gear shall be designed with a minimum factor of safety of six, based on the maximum working load.

(b) Where lifeboat winches are installed, not more than two-part wire falls shall be used, except in specific cases where three-part wire falls may be accepted. Where lifeboat winches are not used, the falls shall be of manila rope or equivalent but wire rope may not be used.

(c) Wire rope falls of 6 x 19 regular lay filler wire construction prelubricated at the factory with suitable neutral wire rope lubricant shall be accepted as standard. Any other type of wire superior or equally as good as the minimum standard specified may be used.

(d) Falls shall be of such length that the lifeboat may be lowered to the water with the vessel at the lightest seagoing draft, listed 15 degrees either way.

(e) All ocean and coastwise vessels and all other vessels of over 1,000 gross tons, not fitted with lifeboat winches, shall be provided with covered tubs, boxes, or reels for stowage of falls and with suitable lowering bitts in easily accessible positions; except that all ocean and coastwise, self-propelled vessels of over 1,000 gross tons, not fitted with lifeboat winches for which contracts for construction are let on or after September 2, 1945, shall be fitted with cruciform bitts in such position as will render lowering practicable.

(f) Where more than one lifeboat is served by the same set of davits, if the falls are of manila rope, separate falls shall be provided to serve each lifeboat.

(g) Such blocks as are necessary to allow the falls to lead fair in all positions of the davit shall be fitted. Sheaves for wire rope shall have a diameter at the base of the groove at least equal to 12 times the diameter of the rope.

(h) There shall be ample clearance between the cheeks of blocks in which manila rope is used. The width between the cheeks shall be half an inch greater than the diameter of new ropes when those ropes are 3¾ inches in circumference or greater; blocks for smaller ropes shall be designed with clearance in the same proportion.

(i) Means for lubrication shall be provided for all moving parts of blocks.

(j) Where lifeboat winches are provided on tank vessels, construction or conversion of which was started prior to November 19, 1952, there shall be at least 8 feet between the center of the drum and the center of the nearest sheave.

(k) Where lifeboat winches are provided on tank vessels, construction or conversion of which is started on or after November 19, 1952, the lead sheaves to the drums shall be so located as to provide fleet angles of not more than 8 degrees for grooved drums and not more than 4 degrees for nongrooved drums. By fleet angle is meant the angle included between an imaginary line from the lead sheave perpendicular to the axis of the drum and the line formed by the wire rope when led from the lead sheave to either extremity of the drum.

§ 33.10–15 Disengaging apparatus—T/OCL.

(a) *Type required.* (1) Lifeboats on all ocean, coastwise and Great Lakes tankships of over 3,000 gross tons, the construction or conversion of which is started on or after January 1, 1961, shall be fitted with mechanical disengaging apparatus of an approved type constructed in accordance with Subpart 160.033 of Subchapter Q (Specifications) of this chapter. Such disengaging apparatus shall be so arranged as to make it possible for the lifeboats to be launched while such vessels are under way or stopped, and for both ends of the lifeboat to be released simultaneously, under tension, by one person. The gears shall be capable of being released from one position in the lifeboat while the boat is fully loaded with allowed persons and equipment. Simultaneous release shall be effected by partially rotating a shaft which shall be continuous and extend from one point of contact with the hooks.

(2) Lifeboats on all ocean, coastwise and Great Lakes tankships of not over 3,000 gross tons shall be fitted with suitable disengaging apparatus. Mechanical disengaging apparatus, if fitted, shall be of approved type constructed in accordance with Subpart 160.033 of Subchapter Q (Specifications) of this chapter.

(3) Lifeboats on all ocean, coastwise and Great Lakes tankships of over 3,000 gross tons, the construction or conversion of which is started before January 1, 1961, shall be fitted with suitable disengaging apparatus. Mechanical disengaging apparatus, if fitted, shall be as follows:

(i) On all such tankships mechanical disengaging apparatus shall be of a type approved by the Commandant.

(ii) On all such ocean and coastwise tankships, the construction or conversion of which was started on or after July 1, 1961, the arrangement shall be as described in subparagraph (1) of this paragraph.

(b) *Replacement of lifeboats on vessels of over 3,000 gross tons.* (1) Re-

placement of lifeboats on ocean, coastwise and Great Lakes tankships of over 3,000 gross tons shall be in accordance with the following:

(1) All replacement lifeboats shall be fitted with approved mechanical disengaging apparatus constructed and arranged as described in paragraph (a)(1) of this section.

(2) Replacement of lifeboats in accordance with the provisions of this paragraph may be made on an individual lifeboat basis.

§ 33.10–20 Disengaging apparatus—T/BR and B/ALL.

(a) Lifeboats shall be fitted with suitable disengaging apparatus. Mechanical disengaging apparatus shall be of a type approved by the Commandant.

(b) Not more than one type of releasing gear shall be fitted in the lifeboats of a particular vessel unless otherwise approved by the Commandant.

Subpart 33.15—Equipment for Lifeboats, Liferafts, or Buoyant Apparatus

§ 33.15–1 Lifeboat, liferaft or buoyant apparatus equipment; general—TB/ALL.

(a) The provisions of this subpart with the exception of § 33.15–90 shall apply to all vessels contracted for on or after May 26, 1965. Vessels contracted for prior to May 26, 1965 shall meet the requirements of § 33.15–90.

(b) Equipment for lifeboats, liferafts, and buoyant apparatus shall be of good quality, efficient for the purpose they are intended to serve, and kept in good condition.

(c) Lifeboats, liferafts and buoyant apparatus shall be fully equipped before the vessel is navigated and the equipment shall remain in such lifesaving appliances throughout the voyage except as provided by § 33.25–15.

(d) It shall be unlawful to stow in any lifeboat, liferaft, or buoyant apparatus any article not required by this subpart unless such articles can be properly stowed so as not to reduce the seating capacity or space available to the occupants and so as not to adversely affect the seaworthiness of such appliances or, in the case of lifeboats, overload the davits or winches.

(e) Loose equipment, except boathooks in lifeboats, shall be securely attached to the lifesaving appliance to which it belongs.

§ 33.15–5 Required equipment for lifeboats—TB/ALL.

(a) The lifeboats for all tank vessels shall be equipped in accordance with Table 33.15–5 (a). For a description of the items contained in this table, and the units comprising the items, see the applicable paragraphs of § 33.15–10. The letter identification prefixing the item in the table corresponds to the paragraph designations in § 33.15–10.

TABLE 33.15–5(a)

Letter identification	Item	Tankship			Tank barge—all waters
		Ocean and coastwise	Great Lakes	Lakes, bays, sounds, and rivers	
a	Bailer	1	1	None	None
b	Bilge pump	1	None	None	None
c	Boathooks	2	1	1	[1] 2
d	Bucket	2	1	1	1
e	Compass and mounting	1	None	None	None
f	Ditty bag	1	None	None	None
g	Drinking cup	1	None	None	[2] 1
h	Fire extinguisher (motor-propelled lifeboats only)	2	2	2	2
i	First-aid kit	1	None	None	None
j	Flashlight	1	1	None	None
k	Hatchet	2	2	1	None
l	Heaving line	2	None	None	None
m	Jackknife	1	None	None	[2] 1
n	Ladder, lifeboat, gunwale	1	None	None	None
o	Lantern	1	1	1	1
p	Lifeline	1	1	1	1
q	Life preservers	2	2	2	2
r	Locker	1	1	None	None
s	Mast and sail (oar-propelled lifeboats only)	1	None	None	None
t	Matches (boxes)	2	1	1	[1] 2
u	Milk, condensed (pounds per person)	1	None	None	None
v	Mirror, signaling	2	None	None	None
w	Oars (units)	[2] 1	[2] 1	[2] 1	[2] 1
x	Oil, illuminating (quarts)	1	1	None	None
y	Oil, storm (gallons)	1	1	None	None
z	Painter	2	2	1	1
aa	Plug	1	1	1	1
bb	Provisions (pounds per person)	2	None	None	None
cc	Rowlocks (units)	[3] 1	[3] 1	[3] 1	[3 4] 1
dd	Rudder and tiller	1	1	None	[2] 1
ee	Sea anchor	1	1	None	None
ff	Signals, distress, floating orange smoke	2	None	None	None
gg	Signals, distress, red hand flare (units)	[3] 1	[2] 1½ unit	None	None
hh	Signals, distress, red parachute flare (units)	[2 3] 1	[2] 1½ unit	None	None
ii	Tool kit (motor-propelled lifeboats only)	[3] 1	[3] 1	[3] 1	[2] 1
jj	Water (quarts per person)	3	None	None	[2] 1
kk	Whistle, signaling	1	None	None	None
ll	Fishing kit	1	None	None	None
mm	Cover, protecting	1	None	None	None
nn	Signals, lifesaving	1	None	None	None
oo	Deadlight kit	[5] 1	None	None	None

[1] Only 1 required on other than seagoing barges.
[2] Seagoing barges only.
[3] For description of unit see § 33.15–10.
[4] Lifeboats on barges need only carry 4 rowlocks.
[5] Vessels in coastwise service need only carry 1 unit for each 5 lifeboats or fraction thereof.
[6] Optional equipment. See § 33.15–10(jj), water.

§ 33.15–10 Description of equipment for lifeboats—TB/ALL.

(a) *Bailer.* The bailer shall have a lanyard attached and shall be of sufficient size and suitable for bailing.

(b) *Bilge pump.* Bilge pumps shall be of an approved type, constructed in accordance with Subpart 160.044 of Subchapter Q (Specifications) of this chapter. They shall be of the size given in Table 33.15–10 (b) depending upon the capacity of the lifeboat as determined by the six-tenths rule as described in § 160.035–9(b).

TABLE 33.15–10 (b)

Capacity of lifeboat, cubic feet		Bilge pump size
Over—	Not over—	
------	330	1
330	700	2
700	------	3

(c) *Boathooks.* Boathooks shall be of the single hook ballpoint type. Boathook handles shall be of clear grained white ash, or equivalent, and of a length and diameter as given in Table 33.15–10 (c).

TABLE 33.15–10 (c)

Length of lifeboat (feet)		Boathook handles	
Over—	Not over—	Diameter (inches)	Length (feet)
------	23	1½	8
23	29	1¾	10
29	------	2	12

(d) *Bucket.* The bucket shall be of heavy gage galvanized iron, or other suitable corrosion-resistant metal, of not less than 2 gallon capacity, and shall have a 6-foot lanyard of 12-thread manila attached.

(e) *Compass and mounting.* The compass and mounting shall be of an approved type, constructed in accordance with U. S. Coast Guard Specification dated December 14, 1944.

(f) *Ditty bag.* The ditty bag shall consist of a canvas bag and shall contain a sailmaker's palm, needles, sail twine, marline and marlinspike.

(g) *Drinking cups.* Drinking cups shall be enamel coated or plastic, graduated in ounces, and be provided with lanyards 3 feet in length.

(h) *Fire extinguisher.* Fire extinguishers shall be of an approved type (4 pounds CO_2 or 2 pounds dry chemical). One shall be attached to each end of the lifeboat.

(i) *First-aid kit.* The first-aid kit shall be of an approved type, constructed and fitted in accordance with Subpart 160.041 of Subchapter Q (Specifications) of this chapter.

(j) *Flashlight.* The flashlight shall be of an approved Type I, Size No. 3, constructed in accordance with Subpart 161.008 of Subchapter Q (Specifications) of this chapter. Three spare cells (or one 3-cell battery) and two spare bulbs, stowed in a watertight container, shall be provided with each flashlight. Batteries shall be replaced yearly during the annual stripping, cleaning, and overhaul of the lifeboat.

(k) *Hatchet.* Hatchets shall be of an approved type, constructed in accordance with Subpart 160.013 of Subchapter Q (Specifications) of this chapter. They shall be attached to the lifeboat by individual lanyards and be readily available for use, one at each end of the lifeboat.

(l) *Heaving line.* The heaving line shall be of adequate strength, 10 fathoms in length, and one inch in circumference. It shall be of such quality as to be buoyant after 24 hours submergence.

(m) *Jackknife.* The jackknife (with can opener) shall be of an approved type, constructed in accordance with Subpart 160.043 of Subchapter Q (Specifications) of this chapter.

(n) *Ladder, lifeboat gunwale.* The lifeboat gunwale ladder shall consist of 3 flat wood steps cut out for handholds. The steps shall be spaced 12 inches apart and fastened with ⅝ inch diameter manila rope. Each rope end shall be tied inside the lifeboat at about amidships with the ladder stowed on top of the side benches and ready for immediate use. Other suitable devices may be specifically approved.

(o) *Lantern.* The lantern shall contain sufficient oil to burn for at least 9 hours, and shall be ready for immediate use.

(p) *Lifeline.* The lifeline shall be properly secured to both sides of the lifeboat along its entire length, festooned in bights not longer than 3 feet, with a seine float in each bight, which float may be omitted if the line is of an inherently buoyant material and absorbs little or no water. The lifeline shall be of a size and strength not less than ⅜-inch diameter manila. The bights shall hang to within 12 inches of the water when the lifeboat is light.

(q) *Life preservers.* Life preservers shall be of an approved type, constructed in accordance with the applicable subparts of Subchapter Q (Specifications) of this chapter.

(r) *Locker.* The locker shall be suitable for the storage and preservation of the small items of equipment.

(s) *Mast and sail.* A unit, consisting of a standing lug sail together with the necessary spars and rigging, shall be provided in general agreement with Table 33.15–10 (s). The sails shall be of good quality canvas, colored Indian Orange (Cable No. 70072, Standard Color Card of America). Rigging shall consist of galvanized wire rope not less than 3/16 inch in diameter. The mast and sail shall be protected by a suitable canvas cover.

TABLE 33.15–10 (s)

Length of lifeboat (feet)		Standing lug sail							Mast [1]		Yard [1]	
Over—	Not over—	Area (square feet)	Luff and head lengths	Leach length	Foot length	Clew to throat	Ounces per square	Commercial designation No.	Length	Diameter (inches)	Length	Diameter (inches)
			Ft. In.	Ft. In.	Ft. In.	Ft. In.			Ft. In.		Ft. In.	
----------	17	58	5 11	12 1	8 10	10 10	14.35	10	11 2	3	6 11	2
17	19	74	6 8	13 8	10 0	12 2	14.35	10	12 6	3	7 8	2
19	21	93	7 5	15 1	11 2	13 8	14.35	10	13 10	3½	8 5	2½
21	23	113	8 3	16 11	12 4	15 1	14.35	10	15 2	3½	9 3	2½
23	25	135	9 0	18 6	13 6	16 6	14.35	10	16 6	4	10 0	3
25	27	158	9 9	20 0	14 7	17 10	17.50	8	17 10	4	10 9	3
27	29	181	10 5	21 5	15 7	19 1	17.50	8	19 2	4½	11 5	3½
29	31	203	11 0	22 8	16 6	20 3	20.74	6	20 6	4½	12 0	3½
31	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)

[1] Mast lengths measured from heel to center of upper halyard sheave. Mast diameters measured at thwart. Mast and yard shall be of clear-grained spruce, fir, or equivalent.
[2] Subject to special consideration.

(t) *Matches.* A box of safety matches in a watertight container stowed in an equipment locker or secured to the underside of the stern thwart if no locker is fitted.

(u) *Milk, condensed.* One pound of condensed milk shall be provided for such person the lifeboat is certified to carry, to be stowed in lockers or other compartments, providing suitable protection.

(v) *Mirrors, signaling.* Signaling mirrors shall be of an approved type.

(w) *Oars.* A unit, consisting of a complement of rowing oars and steering oar, shall be provided for each lifeboat in accordance with Table 33.15–10(w), except that motor-propelled and hand-propelled lifeboats need only be equipped with 4 rowing oars and steering oar. All oars shall be buoyant.

TABLE 33.15–10 (w)

Length of lifeboat (feet)		Number of oars		Length of oars (feet)	
Over—	Not over—	Rowing	Steering	Rowing	Steering
----	15	4	1	8	9
15	19	6	1	10	11
19	21	6	1	11	12
21	23	6	1	12	13
23	25	8	1	13	14
25	27	8	1	14	15
27	----	8	1	15	16

(x) *Oil, illuminating.* One quart of illuminating oil shall be provided in a metal container.

(y) *Oil, storm.* One gallon of vegetable, fish, or animal oil shall be provided in a suitable metal container so constructed as to permit a controlled distribution of oil on the water, and so arranged that it can be attached to the sea anchor.

(z) *Painter.* Painters shall be of manila rope not less than 2¾ inches in circumference, or equivalent, and of a length not less than 3 times the distance between the deck on which the lifeboat is stowed and the light draft of the vessel. For lifeboats on vessels in ocean, coastwise or Great Lakes service one of the painters shall have a long eye splice and be attached to the thwart with a toggle. The other painter shall be attached to the stem.

(aa) *Plug.* The automatic drain required in the lifeboat shall be provided with a cap or plug attached to the lifeboat by a suitable chain.

(bb) *Provisions.* Two pounds of hard bread or its approved equivalent shall be provided for each person the lifeboat is certified to carry. The provisions shall be packaged in hermetically sealed cans of an approved type. The cans shall be stowed in lockers or other compartments providing suitable protection.

(cc) *Rowlocks.* A unit, consisting of sufficient rowlocks and rowlock sockets for each oar required by Table 33.15–10 (w) plus 2 additional rowlocks. The rowlocks shall be attached to the lifeboat by separate chains so as to be available for immediate use, except that the two additional spare rowlocks shall be carried in the equipment locker or stowed near the stern if no locker is fitted. The rowlocks and rowlock sockets shall be distributed so as to provide the maximum amount of single banked oars practicable.

(dd) *Rudder and tiller.* The rudder and tiller shall be constructed in accordance with § 160.035–3(t) in Subpart 160.035 of Subchapter Q (Specifications) of this chapter.

(ee) *Sea anchor.* The sea anchor shall be of an approved type.

(ff) *Signals, distress, floating orange smoke.* Two approved floating orange smoke distress signals, constructed in accordance with Subpart 160.022 of Subchapter Q (Specifications) of this chapter. The service use of this equipment shall be limited to three years from date of manufacture, and replacement shall be made no later than the first annual stripping, cleaning, and overhaul of the lifeboat after the date of expiration.

(gg) *Signals, distress, red hand flare.* A unit, consisting of twelve approved hand red flare distress signals, in a watertight container, constructed in accordance with Subpart 160.021 or 160.023 of Subchapter Q (Specifications) of this chapter. The service use of this equipment shall be limited to three years from date of manufacture, and replace-

ment shall be made no later than the first annual stripping, cleaning, and overhaul of the lifeboat after the date of expiration.

(hh) *Signals, distress, red parachute flare.* A unit, consisting of twelve approved parachute red flare distress signals, with an approved means of projecting them, all contained in a portable watertight container; or twelve approved hand-held rocket-propelled parachute red flare distress signals contained in a portable watertight container. Construction shall be in accordance with Subparts 160.024 and 160.028 or 160.036 of Subchapter Q (Specifications) of this chapter. The service use of this equipment shall be limited to three years from date of manufacture, and replacement shall be made no later than the first annual stripping, cleaning, and overhaul of the lifeboat after the date of expiration.

(ii) *Tool kit.* The tool kit shall consist of at least the following tools contained in a suitable container:

(1) One 12-ounce ball peen hammer.
(2) One screwdriver with 6-inch blade.
(3) One pair 8-inch slip joint pliers.
(4) One 8-inch adjustable end wrench.

(jj) *Water.* (1) For each person the lifeboat is certified to carry, there shall be provided three quarts of drinking water consisting of nine approved hermetically sealed containers per person constructed and filled in accordance with Subpart 160.026 of Subchapter Q (Specifications) of this chapter. The service life of this equipment shall be limited to 5 years from date of packing, and replacement shall be made no later than the first annual stripping, cleaning, and overhaul of the lifeboat after date of expiration. Approved desalting kits capable of producing an equal amount of drinking water may be substituted for not more than one-third of the drinking water required to be carried.

(2) The drinking water containers shall be stowed in drinking water tanks, lockers, or other compartments providing suitable protection.

(kk) *Whistle, signaling.* The whistle shall be of the ball-type, of corrosion-resistant construction, with a 36-inch lanyard attached, and in good working order.

(ll) *Fishing kit.* The fishing kit shall be of approved type constructed in accordance with Subpart 160.061 of Subchapter Q (Specifications) of this chapter.

(mm) *Cover, protecting.* The protecting cover shall be of a highly visible color, and capable of protecting the occupants against injury by exposure.

(nn) *Table of lifesaving signals.* The table of lifesaving signals shall be in accordance with the provisions of Chapter V, Regulation 16, of the International Convention for Safety of Life at Sea, 1960, and shall be printed on water resistant paper.

(oo) *Desalting kit.* One or more approved desalting kits may be used as a substitute for one-third of the required amount of drinking water per person, and shall be constructed in accordance with Subpart 160.058 of Subchapter Q (Specifications) of this chapter.

§ 33.15–15 Required equipment for rigid type liferafts and buoyant apparatus—TB/LBR.

(a) The rigid type liferafts and buoyant apparatus for all vessels shall be equipped in accordance with Table 33.15–15 (a). For a description of the items contained in this table and the units comprising the items, see the applicable paragraphs of § 33.15–20. The letter identification prefixing the item in the table corresponds to the paragraph designation in § 33.15–20.

TABLE 33.15–15 (a)

Letter identification	Item	Liferaft		Buoyant apparatus—All waters
		Great Lakes	Lakes, bays, sounds, rivers,	
a	Boathook	1	1	None
b	Lifeline	[1] 1	[1] 1	[1] 1
c	Matches (boxes)	1	None	None
d	Oars (units)	[1] 1	[1] 1	None
e	Oil, storm (gallons)	1	None	None
f	Painter	1	[4] 1	[4] 1
g	Rowlocks (units)	[1] 1	[1] 1	None
h	Sea anchor	1	None	None
i	Signals, distress (units)	[2] 1	None	None
j	Water light	1	None	[5] 1

[1] Not required on Type A liferafts.
[2] For description of unit see § 33.15–20.
[3] Need only be 2 inches in diameter and of a length equal to the distance between the deck where stowed to the vessel's light draft plus 6 feet.
[4] Not required on buoyant apparatus for less than 25 persons.
[5] Applies to ocean, coastwise and Great Lakes routes.

§ 33.15–16 Required equipment for inflatable liferafts—TB/ALL.

(a) Inflatable liferafts shall be equipped with ocean service equipment for vessels on ocean and coastwise routes and with limited service equipment for vessels on Great Lakes, lakes, bays, sounds, and river routes in accordance with Subpart 160.051 of Subchapter Q (Specifications) of this chapter.

NOTE: Subpart 160.051 of this chapter requires the servicing of inflatable liferafts at approved servicing facilities. Included in the servicing at an approved facility is a complete inspection of the required equipment by a marine inspector.

§ 33.15–20 Description of equipment for liferafts and buoyant apparatus—TB/LBR.

(a) *Boathook.* Boathooks shall be of the single hook ball point type. Boathook handles shall be of clear grained white ash, or equivalent, not less than 8 feet long and 1½ inches in diameter.

(b) *Lifeline.* The lifeline shall be properly secured around the sides and ends of the liferaft, or buoyant apparatus, festooned in bights not longer than 3 feet, with a seine float in each bight, which float may be omitted if the line is of an inherently buoyant material and absorbs little or no water. The lifeline shall be of a size and strength not less than ⅜-inch diameter manila.

(c) *Matches.* A box of safety matches in a watertight container.

(d) *Oars.* A unit, consisting of 4 rowing oars and one steering oar not less than 8 feet in length, shall be provided for liferafts for 7 persons or more. For liferafts for 6 persons or less, a unit shall consist of 2 paddles not less than 5 feet in length.

(e) *Oil, storm.* One gallon of vegetable, fish, or animal oil shall be provided in a suitable metal container so constructed as to permit a controlled distribution of oil on the water, and so arranged that it can be attached to the sea anchor.

(f) *Painter.* Painters shall be of manila rope not less than 2¾ inches in circumference and of a length not less than 3 times the distance between the deck on which the liferafts are stowed and the light draft of the vessel.

(g) *Rowlocks.* A unit, consisting of 5 rowlocks attached to the liferaft by separate chains and ready for immediate use, together with proper rowlock sockets so arranged as to provide 4 rowing positions and 1 steering position with the liferaft floating either side up. Rowlocks and rowlock sockets are not required on liferafts for 6 persons or less.

(h) *Sea anchor.* The sea anchor shall be constructed of good quality canvas or other satisfactory material, and shall be not less than 2 feet in diameter.

(i) *Signals, distress.* (1) A unit, consisting of equipment as specified in subparagraph (2) or (3) of this paragraph. The service use of this equipment shall be limited to 3 years from date of manufacture, and replacement shall be made no later than the first inspection (biennial or reinspection) after the date of expiration.

(2) Twelve parachute red flare distress signals with an approved means of projecting them, all contained in a portable watertight container. Construction shall be in accordance with Subparts 160.024 and 160.028 or 160.036 of Subchapter Q (Specifications) of this chapter.

(3) Six approved hand red flare distress signals and 6 parachute red flare distress signals with an approved means of projecting them, all contained in a portable watertight container. Construction shall be in accordance with Subparts 160.021, 160.024 and 160.028 or 160.036 of Subchapter Q (Specifications) of this chapter.

(j) *Water light.* The water light shall be of an approved automatic electric type, constructed in accordance with Subpart 161.001 of Subchapter Q (Specifications) of this chapter. The water light shall be attached to the liferaft or buoyant apparatus by a 12-thread manila lanyard 3 fathoms in length.

§ 33.15–25 Portable radiotelegraph apparatus—T/OC.

(a) All tankships on an international voyage shall be provided with a portable radio apparatus complying with the requirements of the Federal Communications Commission unless at least one lifeboat on each side of the vessel is fitted with a fixed radio installation. Such

portable radio shall be kept in the radio room, chartroom, or other suitable location ready to be moved to one or other of the lifeboats in the event of an emergency; however, in tankships of 3,000 gross tons and over in which lifeboats are fitted amidships and aft, such equipment shall be kept in a suitable place in the vicinity of those lifeboats which are furthest removed from the ship's main transmitter.

§ 33.15–90 Lifeboat, liferaft and buoyant apparatus equipment on tank vessels contracted for prior to May 26, 1965—TB/ALL.

(a) Vessels contracted for prior to May 26, 1965, shall meet the following requirements:

(1) Except as specifically modified by this paragraph, the requirements of §§ 33.15–5 through 33.15–25 shall be complied with insofar as the number of items of equipment and the method of stowage of the equipment is concerned.

(2) Existing items of equipment previously approved, but not meeting the applicable specifications or requirements set forth in §§ 33.15–5 through 33.15–25 may be continued in service so long as they are maintained in a good condition to the satisfaction of the Officer in Charge, Marine Inspection.

(3) Lifeboats previously approved without automatic drain plugs shall have two plugs or caps attached to the lifeboat by separate chains.

(4) On tank vessels certificated for ocean or coastwise service, and contracted for prior to November 19, 1952, unless other approved means are provided to achieve the same purpose, three ½-inch diameter manila grablines shall be fitted extending from gunwale to gunwale under the keel to enable persons to cling or to climb upon the upturned lifeboat. The ends of each grabline shall be securely attached to the side benches or other permanent part of the lifeboat and each grabline shall be made up with figure eight knots spaced approximately 18 inches apart in order to provide hand grips. Means shall be provided for taking up any slack in the grablines.

(5) All new installations shall meet the applicable specifications or requirements of this part.

Subpart 33.20—Stowage of Lifeboats, Liferafts, and Buoyant Apparatus

§ 33.20–1 Davits and launching devices—TB/ALL.

(a) Tankships of 100 gross tons or more shall be equipped with separate davits for each lifeboat carried.

(b) Tankships of less than 100 gross tons and tank barges where lifeboats are carried shall provide means for the launching of such lifeboats by davits or crane or, where the freeboard is less than 6 feet when the vessel has no cargo aboard, by slide.

(c) On all tankships of 500 gross tons and over in ocean and coastwise service, the conditions set forth in subparagraphs (1) to (5), inclusive, of this paragraph shall apply. Tankships of 500 gross tons and over in Great Lakes service shall comply with the conditions set forth in subparagraphs (1) and (3) of this paragraph.

(1) An approved ladder, constructed in accordance with Subpart 160.017 of Subchapter Q (Specifications) of this chapter shall be provided at each set of davits to afford access to the lifeboats when waterborne.

(2) All davit installations shall have at least 2 lifelines fitted to a davit span. The lifelines shall be of such length as to reach the water at the lightest draft with the vessel listed 15 degrees either way.

(3) Suitable means shall be provided on vessels engaged on international voyages for illuminating the launching gear and the lifeboats during the process of launching the lifeboats from the stowed position until they are waterborne. Similar provisions shall be made on such vessels for the illumination of any liferaft stowage areas. For detailed requirements of such illumination for tank vessels contracted for on or after November 19, 1955, see Part 111 of Subchapter J (Electrical Engineering) of this chapter.

(4) On tankships the construction or conversion of which was started on or after November 19, 1952, where applicable, means shall be provided outside the machinery space to prevent the discharge of water into the lifeboats while they are being lowered. This shall consist of baffles to deflect the water down the vessel's side, reach rods or other means to close the discharge openings, or a remote means for stopping the pumps.

(5) Lifeboats on tankships contracted for on or after May 26, 1965, shall be fitted with skates or other suitable means to facilitate launching against an adverse list of up to 15 degrees. However, skates may be dispensed with if, in the opinion of the Commandant, the arrangements are such as to insure that the lifeboats can be satisfactorily launched without skates. For vessels contracted for prior to May 26, 1965, the foregoing shall apply unless in the opinion of the Officer in Charge, Marine Inspection, it is unreasonable or impracticable or the arrangement or construction of the vessel make their use unnecessary.

(d) Lifeboats shall not be placed in the bows of tankships. They shall be stowed in such positions as to insure safe launching.

(e) Suitable access to the lifeboats shall be provided to enable the crew to prepare the lifeboats for launching.

(f) Means shall be provided for bringing the lifeboats against the ship's side and holding them there so that persons may be safely embarked.

(g) On a tankship on which inflatable liferafts have been substituted for lifeboats, a launching device for each lifeboat to be used for rescue purposes shall be installed. Radial type davits or other means may be used in sheltered waters if acceptable to the Officer in Charge, Marine Inspection.

§ 33.20–3 Embarkation aids into inflatable liferafts—T/ALL.

(a) Where inflatable liferafts are substituted for lifeboats, unless freeboard at embarkation point is such that embarkation devices are not necessary, suitable arrangements shall be made for embarkation which shall include sufficient ladders or other suitable devices to facilitate embarkation into the inflatable liferafts when waterborne.

§ 33.20–5 Lifeboat davit falls—T/ALL.

All tankships over 1,000 gross tons shall be provided with covered tubs, boxes, or reels, in which to stow the running part of the lifeboat davit falls. Lifeboat falls shall not be painted.

§ 33.20–10 Lifeboats and liferafts kept clear for launching—TB/ALL.

The decks on which lifeboats or liferafts are carried shall be kept clear of freight or any other obstruction that would interfere with the immediate launching of the lifeboats or liferafts.

§ 33.20–15 Stowage of lifeboats and liferafts—TB/ALL.

(a) All the lifeboats and liferafts shall be stowed in such a way that they can be launched in the shortest possible time, and that, even under unfavorable conditions of list and trim from the point of view of the handling of the lifeboats and liferafts, it may be possible to embark in them as large a number of persons as possible.

(b) For tankships, arrangements shall be such that it may be possible to launch on either side of the vessel as large a number of lifeboats and liferafts as possible.

(c) Where practicable, lifeboat chocks shall be so fitted that the lifeboats they serve shall not require lifting before launching.

(d) Inflatable liferafts shall be stowed in such a manner that they will float free in the event of the vessel sinking. Stowage and launching arrangements shall be to the satisfaction of the Officer in Charge, Marine Inspection.

Subpart 33.25—Markings, Care and Inspection

§ 33.25–5 Numbering and marking of lifeboats—TB/ALL.

(a) The number of each lifeboat shall be plainly marked or painted on each side of the bow in figures 3 inches high; and, where lifeboats are carried on both sides of a vessel, the odd-numbered boats shall be stowed on the starboard side, and the even-numbered boats on the port side; i.e., lifeboat No. 1 shall be forward on the starboard side, and lifeboat No. 3 next abaft lifeboat No. 1; lifeboat No. 2 shall be forward on the port side and lifeboat No. 4 next abaft lifeboat No. 2, etc.

(b) The cubical contents and number of persons allowed to be carried on each lifeboat shall be plainly marked or painted on each side of the bow in letters and numbers 1½ inches high. For vessels on an international voyage, the vessel's port of registry shall be added in similar type letters. In addition, the number of persons allowed shall be plainly marked or painted on the top of at least two of the thwarts in letters and numbers 3 inches high.

(c) Such letters and numbers shall be dark on a light ground or light on a dark ground.

(d) The top of thwarts, side benches and footings of lifeboats shall be painted or otherwise colored international orange. The area in way of the red mechanical disengaging gear control lever, from the keel to the side bench, shall be painted or otherwise colored white, to provide a contrasting background for the lever. This band of white should be approximately 12 inches wide depending on the internal arrangements of the lifeboat.

(e) Where mechanical disengaging apparatus is used, the control effecting the release of the lifeboat shall be painted bright red and shall have thereon in raised letters either the words—"Danger—Lever Drops Boat," or the words—"Danger—Lever Releases Hooks."

§ 33.25–10 Marking of liferafts—TB/ALL.

(a) There shall be stenciled in a conspicuous place on each rigid type liferaft the number of persons the liferaft can carry.

(b) There shall be stenciled in a conspicuous place in the immediate vicinity of each inflatable liferaft the following:

INFLATABLE LIFERAFT NO. ------
------ PERSONS CAPACITY

These markings shall not be placed on the inflatable liferaft containers.

NOTE: § 160.051–8(a) of Subchapter Q (Specifications) of this chapter requires permanently attached nameplates on each inflatable liferaft and carrying case. The nameplate contains the following information: The name of manufacturer, approval number, manufacturer's model number, serial number and lot number, and the number of persons for which the inflatable liferaft is approved. In addition, the carrying case shall be marked "Ocean Service Equipment" or "Limited Service Equipment" as applicable, together with the marine inspector's initials, the date, and the letters "USCG."

§ 33.25–15 Overhaul—TB/ALL.

(a) All lifeboats, rescue boats, and rigid type liferafts shall be stripped, cleaned and thoroughly overhauled at least once in every year.

(b) Tank vessels in ocean or coastwise service having a sufficient number of lifeboats on each side to accommodate all persons on board may care for their lifeboats at sea: *Provided*, That a number of lifeboats sufficient to accommodate all persons on board are fully equipped and ready for use at all times.

(c) The lifeboat davits and falls shall be overhauled at least once in every year.

(d) Inflatable liferafts shall be serviced at an approved servicing facility in accordance with the provisions of Subpart 160.051 of Subchapter Q (Specifications) of this chapter. Inflatable liferafts shall be serviced at an approved servicing facility every 12 months or not later than the next vessel inspection for certification provided the total time since date of last servicing does not exceed 15 months. The period for servicing is computed from date of last servicing. Except in emergencies no servicing should be done aboard vessels. If at any time external damage is found to the container or straps or if the seal is broken, the Officer in Charge, Marine Inspection, shall be notified and the raft shall be serviced by an approved servicing facility.

NOTE: After the raft has been satisfactorily serviced in the presence of a marine inspector at an approved servicing facility, the raft is repacked and sealed and the carrying case stamped "PASSED" together with the date, port, and the marine inspector's initials.

§ 33.25–20 Maintenance—TB/ALL.

(a) Every lifeboat, liferaft, or piece of buoyant apparatus together with its equipment shall be kept in every respect in good condition and ready for immediate use.

(b) The material that may support the platform of a liferaft or buoyant apparatus shall be examined to determine that its strength is maintained.

(c) Air tanks shall be examined to see that they are in good condition but pressure need not be applied unless the inspector so desires to assure himself as to their condition.

(d) Disengaging apparatus, blocks and falls, if used, shall be determined to be in good condition.

(e) Disengaging apparatus, if used, shall be shown on the inspector's report, and if the inspector is unable to identify it by name, he shall take the matter up with the Coast Guard District Commander in order that such apparatus may be traced for identification and approval record.

Subpart 33.30—Manning of Lifeboats and Liferafts

§ 33.30–1 Persons in charge of each lifeboat and liferaft—T/O.

A licensed deck officer, an able seaman, or a certificated lifeboatman shall be placed in charge of each lifeboat or liferaft. He shall have a list of its lifeboatmen and other members of its crew which shall be sufficient for her safe management, and shall see that the men placed under his orders are acquainted with their several duties and stations. A second in command shall also be appointed which person shall be either a licensed deck officer, an able seaman or a certificated lifeboatman.

§ 33.30–3 Person in charge of each lifeboat or liferaft—T/CLB.

(a) A licensed deck officer, an able seaman, or a certificated lifeboatman shall be placed in charge of each lifeboat or liferaft.

(b) The person in charge shall have a list of its lifeboatmen and other members of its crew, which shall be sufficient for her safe management, and shall see that the men placed under his orders are acquainted with their several duties and stations.

§ 33.30–5 Manning of lifeboats and liferafts—TB/OCLB.

(a) There shall be for each lifeboat or liferaft a number of lifeboatmen at least equal to that specified as follows, provided, that vessels required to carry sufficient lifeboats on each side to accommodate all persons on board need only carry the lifeboatmen required for the lifeboats on one side:

(1) If the lifeboat or liferaft carries 25 persons or less, the minimum number of certificated lifeboatmen shall be 1;

(2) If the lifeboat or liferaft carries 26 persons and less than 41 persons the minimum number of certificated lifeboatmen shall be 2;

(3) If the lifeboat or liferaft carries 41 persons and less than 61 persons the minimum number of certificated lifeboatmen shall be 3.

(b) The allocation of the certificated lifeboatmen to each lifeboat and liferaft remains within the discretion of the master, according to the circumstances.

Subpart 33.35—Life Preservers

§ 33.35–1 Number and type required—TB/ALL.

(a) All tank vessels shall be provided with one approved life preserver for each person carried. An additional number of life preservers shall be provided for personnel on watch in the engineroom and pilothouse.

(b) In addition to the life preservers required by paragraph (a) of this section, all tankships on an international voyage shall be provided with approved type life preservers for 5 percent of the persons carried. The additional number of life preservers required for personnel on watch in the engineroom and pilothouse may be counted toward meeting this requirement.

(c) All life preservers on tankships of 500 gross tons and over on an international voyage shall be provided with a whistle of the ball-type, of corrosion-resistant construction, with a 3-foot lanyard attached, and in good working order. It shall be attached to the life preserver by the lanyard alone without hooks, snaps, clips, etc., and shall extend not less than 15 inches from the life preserver body. While stowed on the life preserver, the whistle lanyard shall be coiled and stopped-off.

(R.S. 4491, as amended; 46 U.S.C. 489)

§ 33.35–5 Distribution and stowage—TB/ALL.

Life preservers shall be distributed throughout the cabins, staterooms, berths, and other places convenient for each person on such tank vessels. The stowage of the additional number of life preservers shall be such that they are readily accessible to personnel on watch in the engineroom and pilothouse.

§ 33.35–10 Shipboard inspections—TB/ALL.

At each inspection for certification, or oftener if deemed necessary, the life preserver shall be examined by an inspector

to determine serviceability. When life preservers are found to be in accordance with the requirements, the inspector shall stamp them with the word "Passed," his initials, port, and date. Life preservers found not to be in a serviceable condition shall be removed from the vessel's equipment and, if beyond repair, shall be destroyed in the presence of the inspector.

§ 33.35–15 Requirements for life preservers—TB/ALL.

(a) The specifications regarding life preservers are in Subparts 160.001, 160.002, 160.005, 160.006, and 160.055 of Subchapter Q (Specifications) of this chapter.

(b) Cork and balsa wood life preservers, constructed in accordance with the applicable provisions of Subpart 160.003 or 160.004 and manufactured as approved life preservers prior to July 1, 1965, may be accepted as new or replacement equipment required by this subchapter if such life preservers are serviceable and in good condition to the satisfaction of the Officer in Charge, Marine Inspection: *Provided, however,* That such life preservers bearing basic Approval No. 160.003 or 160.004 shall not be considered as approved equipment meeting the requirements for those tankships on an international voyage, constructed or contracted for on or after May 26, 1965.

(c) All kapok and fibrous glass life preservers which do not have plastic-covered pad inserts, as required by Subparts 160.002 and 160.005 of Subchapter Q (Specifications) of this chapter, shall be removed from service.

Subpart 33.40—Ring Life Buoys and Water Lights

§ 33.40–1 Ring life buoys and water lights, general requirements—TB/ALL.

(a) All ring life buoys shall be of an approved type, constructed in accordance with Subpart 160.009 or 160.050 of Subchapter Q (Specifications) of this chapter.

(b) All water lights shall be of an approved automatic electric type, constructed in accordance with Subpart 161.001 of Subchapter Q (Specifications) of this chapter.

(c) All self-activated smoke signals shall be of an approved type, constructed in accordance with the requirements of Subpart 160.057 of Subchapter Q (Specifications) of this chapter, which shall be capable of producing smoke of a highly visible color for at least 15 minutes.

(R.S. 4491, as amended; 46 U.S.C. 489)

§ 33.40–5 Number required on tankships—T/ALL.

(a) The minimum number of approved 30-inch ring life buoys, and the minimum number of which shall have water lights attached, shall be in accordance with Table 33.40–5(a).

TABLE 33.40–5(a)

Length of tankship (feet)	Ocean		All services other than ocean	
	Minimum number of ring life buoys	Minimum number of ring life buoys in column 2 which shall have water lights attached	Minimum number of ring life buoys	Minimum number of ring life buoys in column 4 which shall have water lights attached
Column 1	Column 2	Column 3	Column 4	Column 5
Under 100	8	6	2	1
100 and under 200	8	6	4	2
200 and under 300	8	6	6	2
300 and under 400	12	6	12	4
400 and under 600	18	9	18	9
600 and under 800	24	12	24	12
800 and over	30	15	30	15

(b) One of the ring life buoys on each side of the vessel shall have secured to it a line at least 15 fathoms in length. On tankships on an international voyage, the line shall be of the buoyant type.

(c) On tankships on an international voyage, at least two of the ring life buoys with waterlights attached as required by Table 33.40–5(a), shall also be provided with an approved self-activated smoke signal and shall be capable of quick release from the bridge.

(d) On tankships on an international voyage, the ring life buoys required by this section shall be orange in color.

§ 33.40–10 Number required on tank barges—B/ALL.

All tank barges regardless of size, shall have at least two approved 30 inch ring life buoys on board: *Provided,* That unmanned barges are exempt from this section.

§ 33.40–15 Distribution and security—TB/ALL.

(a) All ring life buoys shall be placed so as to be readily accessible to the persons on board, and their positions plainly indicated so as to be known to all persons concerned.

(b) The ring life buoys shall always be capable of being cast loose, and shall not be permanently secured in any way.

Subpart 33.45—Distress Signals

§ 33.45–1 Distress signals—T/ALL and B/OC.

On every manned tank vessel of 150 gross tons and over there shall be carried twelve approved hand red flare distress signals in a watertight container, or twelve approved hand combination flare and smoke distress signals in a watertight container. Service use shall be limited to a period of three years from date of manufacture, and replacement of out-dated items shall be made at the first port of arrival in the United States where such distress signals are available, except that replacement shall be made in all cases within twelve months after the date of expiration. Distress signals not bearing date of manufacture shall not be carried. For specifications for these signals, see Subparts 160.021 and 160.023 of Subchapter Q (Specifications) of this chapter.

(R.S. 4491, as amended; 46 U.S.C. 489)

§ 33.45–5 Parachute distress signals—T/OC.

In addition to the equipment required by § 33.45–1, all tankships of 500 gross tons and over shall be provided with 12 approved hand-held rocket-propelled parachute red flare distress signals, contained in a portable watertight container, constructed in accordance with Subpart 160.036 of Subchapter Q (Specifications) of this chapter. Service use of the distress signals shall be limited to a period of three years from date of manufacture, and replacement of outdated items shall be made at the first port of arrival in the United States where such distress signals are available, except that replacement shall be made in all cases within 12 months after the date of expiration.

§ 33.45–10 Stowage of distress signals—TB/ALL.

All tank vessels required to carry pyrotechnic distress signals shall carry such signals in watertight containers near the pilothouse, on the navigator's bridge, or in some other suitable, readily accessible location other than in the lifeboats. In no case shall pyrotechnics be permitted to be carried in enclosed spaces, adjacent to cargo tanks or near sources of heat. Tank vessels required to carry a magazine chest may carry the distress signals in the magazine chest.

Subpart 33.50—Signaling Lamp

§ 33.50–1 Signaling lamp—T/O.

Tankships of over 150 gross tons engaged on international voyages shall be equipped with an efficient daylight signaling lamp. For detailed requirements see Subpart 113.60 of Subchapter J (Electrical Engineering) of this chapter.

Subpart 33.55—Line-Throwing Appliances

§ 33.55–1 Line-throwing appliances required—T/OC.

(a) All ocean and coastwise tankships of 150 gross tons and over shall be equipped with an approved line-throwing appliance and equipment auxiliary thereto, as specified in this subpart.

(b) Tankships of 500 gross tons or more shall be equipped with an approved line-throwing appliance and equipment auxiliary thereto, of the impulse-projected rocket type, the requirements for which are set forth in Subpart 160.040 of Subchapter Q (Specifications) of this chapter. Lyle gun type line-throwing appliances in service on or before July 1, 1951, may be continued in use so long as in good and serviceable condition: *Provided,* That any replacements shall

be made with a line-throwing appliance of the impulse-projected rocket type.

(c) Tankships of 150 gross tons and over and less than 500 gross tons shall be equipped with an approved line-throwing appliance and equipment auxiliary thereto, of the shoulder gun type or the impulse-projected rocket type, the requirements for which are set forth in Subparts 160.031 and 160.040, respectively, of Subchapter Q (Specifications) of this chapter. Lyle gun type line-throwing appliances in service on or before July 1, 1951, may be continued in use so long as in good and serviceable condition: *Provided*, That any replacements shall be made with a line-throwing appliance of the shoulder gun type or the impulse-projected rocket type.

(d) Service use of rockets shall be limited to a period of 4 years from date of manufacture, and replacement of outdated items shall be made at the first port of arrival in the United States where such rockets are available, except that replacement shall be made in all cases within 12 months after the date of expiration.

(R.S. 4491, as amended; 46 U.S.C. 489)

§ 33.55–5 Accessibility—T/OC.

The line-throwing appliance and its equipment shall be kept always easily and immediately accessible and read for use. No part of this equipment shall be used for any other purpose.

§ 33.55–10 Equipment for line-throwing appliances—T/OC.

The equipment enumerated below is required to be carried with the various types of line-throwing appliances:

(a) *Impulse-projected rocket type.* Four rockets (2 of which shall be of the buoyant type), 4 primer-ejector cartridges, 4 service lines (each of a length not less than that specified in the approval of the appliance carried, of 7/32-inch to 9/32-inch diameter, of flax or manila, and having a breaking strength of at least 500 pounds, to be kept in faking boxes or on reels), 1 auxiliary line (1,500 feet of 3-inch circumference manila), 1 can of oil, 1 cleaning brush, 12 wiping patches, and 1 set of instructions furnished by the manufacturer, all in a suitable case or box with the appliance, except that the service lines and the auxiliary line may be stowed in an accessible location nearby.

(b) *Shoulder gun type.* Ten (10) service projectiles, 4 service lines (each not less than 400 feet in length of 3/8-inch circumference flax or cotton and having not less than 250 pounds breaking strength, or each not less than 600 feet in length of 1/16-inch or more diameter woven or braided nylon, very flexible, having a breaking strength not less than 140 pounds, or equivalent, to be kept in faking boxes or reels), 25 cartridges, 1 cleaning rod with brush, 1 can of oil, 12 wiping patches and 1 set of instructions, all in a suitable case or box with the gun, with an auxiliary line (500 feet of 3-inch circumference manila) accessible for use.

(c) *Lyle gun type on existing tank vessels.* Six (6) service projectiles, 4 service lines (each 1,700 feet of 7/32-inch to 9/32-inch diameter flax or manila, having not less than 500 pounds breaking strength, in faking boxes or reels), 1 auxiliary line (1,500 feet of 3-inch circumference manila), 1 approved firing attachment (with accessories consisting of lanyard, wrench, washer to fit between barrel and shoulder of firing attachment, blank plug for screwing into gun when firing attachment is not in place, cartridge extractor, and 25 primers in watertight metal box), 18 bags (2½ ounces each) of black powder marked "One-half normal charge for Lyle gun, 2½ ounces black powder" in nonferrous metal screw top container, 25 paper wads, 1 ram rod, 1 wire brush, 1 can light petrolatum, 12 wiping patches, 1 tapered wooden plug for muzzle of gun when not in use, and 1 set of instructions furnished by the manufacturer of the gun, all in a suitable box or chest with the gun.

§ 33.55–15 Service recommendations—T/OC.

The following precautions and procedure are recommended for the use of line-throwing appliances and equipment:

(a) *Impulse-projected rocket type.* Follow the operating instructions and safety precautions furnished by the manufacturer.

(b) *Shoulder gun type.* Follow the operating instructions and safety precautions furnished by the manufacturer.

(c) *Lyle gun type on existing tank vessels.* (1) Service powder charge should be about 5 ounces of black powder, and the powder bags should be furnished to the vessel containing 2½ ounces of black powder and marked "one-half normal charge." Under extraordinary circumstances, 7½ ounces (three 2½-ounce bags) of black powder may be used.

(2) In making the line fast to the shank, pass it through the eye and take three or more half-hitches around its own part, leaving a loop of about 10 to 12 inches and taking the hitches about 6 inches apart. This will allow the line to slip slightly through the eye of the shank before the hitches fetch up, thus easing the strain on the line at the loop during the initial acceleration.

(3) A considerable bight led over the side is recommended wherever possible, as it will tend to lessen the jerk on the line at initial acceleration.

(4) At least a fathom of the line from the shank should be thoroughly wet before using to prevent burning.

(5) The faking box or reel should always be faced in the direction of the line of fire and placed abreast of the gun and as close to ship's side as possible. It is not advisable to place the line too close to the muzzle of the gun, as the concussion may lift several layers or coils from the top, causing a snarl which in turn may cause the line to part.

(6) Care should be taken in placing the equipment to prevent fouling of the line in rigging, ridge ropes, etc., which have a tendency to rise or jump up when the gun is fired.

(7) Having made the gun and equipment ready for use, the following procedure in firing is recommended: select a place where the gun may recoil without striking anything, or where it may be securely lashed down. Note the position of the vessel to be relieved, and the direction and approximate force of the wind, and then place the gun in position, making allowance for the drift of the line. Place the line on the windward side of the gun and about 3 feet from it. Make the line fast in the eye of the shank and insert the powder charge, projectile, and primer. In loading, make sure that the projectile is seated against the wad.

(8) After using, the line should be thoroughly dried before rewinding or faking.

PART 34—FIREFIGHTING EQUIPMENT

Subpart 34.01—Application

Sec.
34.01–1 General—TB/ALL.
34.01–5 Equipment installed but not required—TB/ALL.
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Subpart 34.05—Firefighting Equipment, Where Required

34.05–1 Fire main system—T/ALL.
34.05–5 Fire-extinguishing systems—T/ALL.
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Subpart 34.10—Fire Main System, Details

34.10–1 Application—TB/ALL.
34.10–5 Fire pumps—T/ALL.
34.10–10 Fire station hydrants, hose and nozzles—T/ALL.
34.10–15 Piping—T/ALL.
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Subpart 34.13—Steam Smothering System, Details

34.13–1 Application—T/ALL.
34.13–90 Installations contracted for prior to January 1, 1962—T/ALL.

Subpart 34.15—Carbon Dioxide Extinguishing Systems, Details

34.15–1 Application—T/ALL.
34.15–5 Quantity, pipe sizes, and discharge rates—T/ALL.
34.15–10 Controls—T/ALL.
34.15–15 Piping—T/ALL.
34.15–20 Carbon dioxide storage—T/ALL.
34.15–25 Discharge outlets—T/ALL.
34.15–30 Alarms—T/ALL.
34.15–35 Enclosure openings—T/ALL.
34.15–40 Pressure relief—T/ALL.
34.15–90 Installations contracted for prior to January 1, 1962—T/ALL.

Subpart 34.17—Fixed Foam Extinguishing Systems, Details

34.17–1 Application—T/ALL.
34.17–5 Quantity of foam required—T/ALL.
34.17–10 Controls—T/ALL.
34.17–15 Piping—T/ALL.
34.17–20 Discharge outlets—T/ALL.
34.17–25 Additional protection required—T/ALL.
34.17–90 Installations contracted for prior to January 1, 1962—T/ALL.

Subpart 34.20—Deck Foam System, Details

34.20–1 Application—T/ALL.
34.20–3 Cargo area definition—T/ALL.
34.20–5 Quantity of foam required—T/ALL.

Sec.
34.20-10 Controls—T/ALL.
34.20-15 Piping—T/ALL.
34.20-20 Discharge outlets—T/ALL.
34.20-90 Installations contracted for prior to January 1, 1962—T/ALL.

Subpart 34.25—Water Spray Extinguishing Systems, Details

34.25-1 Application—T/ALL.
34.25-5 Capacity and arrangement—T/ALL.
34.25-10 Controls—T/ALL.
34.25-15 Piping—T/ALL.
34.25-20 Spray nozzles—T/ALL.
34.25-90 Installations contracted for prior to January 1, 1964—T/ALL.

Subpart 34.50—Portable and Semiportable Extinguishers

34.50-1 Application—TB/ALL.
34.50-5 Classification—TB/ALL.
34.50-10 Location—TB/ALL.
34.50-15 Spare charges—TB/ALL.
34.50-90 Vessels contracted for prior to January 1, 1962—TB/ALL.

Subpart 34.55—Sand

34.55-1 Application—TB/ALL.
34.55-5 Amount required—TB/ALL.
34.55-10 Substitute—TB/ALL.

Subpart 34.60—Fire Axes

34.60-1 Application—T/ALL.
34.60-5 Number required—T/ALL.
34.60-10 Location—T/ALL.

AUTHORITY: The provisions of this Part 34 issued under R.S. 4405, as amended, 4417a, as amended, 4462, as amended; 46 U.S.C. 375, 391a, 416. Interpret or apply R.S. 4488, as amended, sec. 3, 68 Stat. 675; 46 U.S.C. 481, 50 U.S.C. 198; E.O. 11239, July 31, 1965, 30 F.R. 9671, 3 CFR, 1965 Supp. Treasury Department Orders 120, July 31, 1950, 15 F.R. 6521; 167-14, Nov. 26, 1954, 19 F.R. 8026; 167-38, Oct. 26, 1959, 24 F.R. 8857.

Subpart 34.01—Application

§ 34.01-1 General—TB/ALL.

(a) The provisions of this part shall apply to all tank vessels except as otherwise noted in this part.

§ 34.01-5 Equipment installed but not required—TB/ALL.

(a) Where firefighting equipment is not required, but is installed, the equipment and its installation shall be of an approved type.

§ 34.01-10 Protection for unusual arrangements or special products—TB/ALL.

(a) The provisions of this part contemplate fire protection for tank vessels of conventional design carrying the usual liquid petroleum products in internal tanks. Whenever unusual arrangements exist or special cargoes are carried upon which the vessel's normal firefighting equipment will be ineffective, additional suitable firefighting equipment of approved type shall be carried.

Subpart 34.05—Firefighting Equipment, Where Required

§ 34.05-1 Fire main system—T/ALL.

(a) Fire pumps, piping, hydrants, hose and nozzles shall be installed on all tankships.

(b) The arrangements and details of the fire main system shall be as set forth in Subpart 34.10.

§ 34.05-5 Fire-extinguishing systems—T/ALL.

(a) Approved fire-extinguishing systems shall be installed on all tank ships in the following locations:

(1) *Dry cargo compartments.* A carbon dioxide or water spray system shall be installed for the protection of all dry cargo compartments. On vessels contracted for prior to January 1, 1962, a steam smothering system may be used in lieu thereof. In any case, where such dry cargo compartments are readily accessible by means of doors such spaces need be protected only by the fire main system.

(2) *Cargo tanks.* A deck foam system shall be installed for the protection of all cargo tank spaces. Where a deck foam system is installed, an approved inert gas, steam or other system may also be installed for purposes of fire prevention or inerting of cargo tanks. For vessels under 100 feet in length, the semiportable equipment required by footnote 1 of Table 34.10-5(a) will be considered as meeting the requirements of this subparagraph. On vessels contracted for prior to January 1, 1962, a steam smothering, inert gas, fixed foam or carbon dioxide system may be used in lieu of the deck foam system for the protection of the cargo tank spaces.

(3) *Lamp and paint lockers and similar spaces.* A carbon dioxide or water spray system shall be installed in all lamp and paint lockers, oil rooms, and similar spaces. Vessels contracted for prior to January 1, 1962, shall have a carbon dioxide, water spray, or steam smothering system. Vessels contracted for prior to November 19, 1952, shall have a carbon dioxide water spray, steam smothering, or foam system.

(4) *Pumprooms.* A carbon dioxide, inert gas, foam or water spray system shall be installed for the protection of all pumprooms. Vessels contracted for prior to January 1, 1962, and after July 1, 1951, shall have the same protection or a steam smothering system. For vessels contracted for prior to July 1, 1951, such systems are not required but if installed shall meet the requirements of this section.

(5) *Boilerrooms.* On tankships contracted for on or after November 19, 1952, a carbon dioxide or foam system shall be installed for the protection of all spaces containing oil fired boilers, either main or auxiliary, their fuel oil service pumps and/or such fuel oil units as the heaters, strainers, valves, manifolds, etc., that are subject to the discharge pressure of the fuel oil service pumps.

(6) *Machinery spaces.* A carbon dioxide system shall be installed for the protection of machinery spaces containing internal combustion propelling engines using fuel having a flashpoint of less than 110 degrees F.

(7) *Internal combustion installations.* If a fire-extinguishing system is installed to protect an internal combustion installation, the system shall be of the carbon dioxide type.

(8) *Enclosed ventilating system.* On tankships contracted for on or after January 1, 1962, where an enclosed ventilating system is installed for electric propulsion motors or generators, a carbon dioxide extinguishing system shall be installed in such system.

(b) The arrangements and details of the fire-extinguishing systems shall be as set forth in Subparts 34.10 through 34.20.

§ 34.05-10 Portable and semiportable extinguishers—TB/ALL.

(a) Approved portable and semiportable extinguishers shall be provided for all tank vessels.

(b) The type, size, location and arrangement of portable and semiportable extinguishers shall be as set forth in Subpart 34.50.

§ 34.05-15 Sand—TB/ALL.

(a) All spaces containing oil fired boilers shall have available in such spaces sand or an acceptable substitute.

(b) The arrangement and details of the carriage of the sand shall be as set forth in Subpart 34.55.

§ 34.05-20 Fire axes—T/ALL.

(a) Fire axes shall be provided on all tankships.

(b) The location and arrangement of fire axes shall be as set forth in Subpart 34.60.

Subpart 34.10—Fire Main System, Details

§ 34.10-1 Application—TB/ALL.

(a) On all tankships the provisions of this subpart, with the exception of § 34.10-90, shall apply to all fire main installations contracted for on or after May 26, 1965. Installations contracted for prior to May 26, 1965, shall meet the requirements of § 34.10-90.

(b) If a fire main system is installed on a tank barge, the system shall meet the intent of this subpart insofar as reasonable and practicable.

§ 34.10-5 Fire pumps—T/ALL.

(a) Tankships shall be equipped with independently driven fire pumps in accordance with Table 34.10-5(a).

TABLE 34.10-5(a)—FIRE PUMPS

Size vessel, L.O.A.		Minimum number of pumps	Powerful streams of water per pump	Minimum hydrant and hose size	
Over—	Not over—			Exterior stations	Interior stations
(*Feet*)	(*Feet*)			(*Inches*)	(*Inches*)
	100	[1]			
100	250	[2] 1	[3] 2	1½	1½
250	400	2	[3] 2	1½	1½
400	650	2	[3] 2	[4] 2½	1½
650		2	[3] 3	[4] 2½	1½

[1] Vessels of 65 feet and not over 100 feet shall be equipped with 2 B-V extinguishers. (Refer to Table 34.50-5(c).) Vessels under 65 feet shall be equipped with 1 B-V extinguisher. (Refer to Table 34.50-5(c).)

[2] Vessels of 1,000 gross tons and over on an international voyage shall have at least 2 fire pumps.

[3] From hydrants having greatest pressure drop between fire-pump(s) and nozzles.

[4] Where 2½-inch hydrant size is required, two 1½-inch outlets may be substituted therefor with two 1½-inch hoses.

(b) Each pump shall be capable of delivering simultaneously the number of streams of water required by Table

34.10–5(a) from the outlets having the greatest pressure drop between fire pump(s) and nozzles at a Pitot tube pressure of approximately 75 p.s.i. Where 1½-inch hose is permitted in lieu of 2½-inch hose by footnote 3 of Table 34.10–5(a), the pump capacity shall be determined on the basis that both hoses are used.

(c) On tankships of 1,000 gross tons and over on an international voyage, each required fire pump, while delivering water through the fire main system at a pressure corresponding to that required by § 34.10–15(e), shall have a minimum capacity of at least two-thirds of that required for an independent bilge pump if no length correction is taken for the cargo tank space. However, in no case shall the capacity of each fire pump be less than that otherwise required by this section.

(d) Fire pumps shall be fitted on the discharge side with relief valves set to relieve at 25 p.s.i. in excess of the pressure necessary to maintain the requirements of paragraph (b) of this section.

(e) Fire pumps shall be fitted with a pressure gage on the discharge side of the pumps.

(f) Fire pumps may be used for other purposes provided at least one of the required pumps is kept available for use on the fire system at all times. Unless specifically approved by the Commandant no branch lines shall be connected to the fire mains for other than fire, deck wash or tank cleaning purposes. Other discharge lines shall lead from a discharge manifold near the fire pump. In no case shall a pump having connection to an oil line be used as a fire pump.

(g) On all vessels where two fire pumps are required, they shall be located in separate spaces, and the arrangement of pumps, sea connections, and sources of power shall be such as to insure that a fire in any one space will not put all of the fire pumps out of operation. However, where it is shown to the satisfaction of the Commandant that it is unreasonable or impracticable to meet this requirement due to the size, or arrangement of the vessel, or for other reasons, the installation of a total flooding carbon dioxide system may be accepted as an alternate method of extinguishing any fire which would affect the powering and operation of at least one of the required fire pumps.

§ 34.10–10 Fire station hydrants, hose and nozzles—T/ALL.

(a) The size of fire station hydrants and hose required shall be as noted in Table 34.10–5(a).

(b) Fire hydrants shall be of sufficient number and so located that any part of living quarters, storerooms, working spaces and weather decks accessible to crew while at sea may be reached with two effective spray patterns of water, one of which shall be from a single 50-foot length of hose. In main machinery spaces all portions of such spaces shall be capable of being reached by at least 2 effective spray patterns of water, each of which shall be from a single 50-foot length of hose from separate outlets.

(c) The outlets at the fire station hydrant shall be limited to any position from the horizontal to the vertical pointing downward so that hose will lead horizontally or downward to minimize possibility of kinking.

(d) All fire station hydrants shall be equipped with spanners suitable for use on the hose at that station.

(e) Each fire station hydrant shall be provided with at least one length of hose with approved combination nozzle attached. A suitable hose rack or other device shall be provided. Hose racks on weather decks shall be located so as to afford protection from heavy seas. The hose shall be stored in the open or so as to be readily visible.

(f) The pipes and fire station hydrants shall be so placed that the fire hose may be easily coupled to them. All hydrants shall be so located as to be readily accessible. If deck cargo is carried, it shall not interfere with access to the fire station hydrants, and the pipes shall be arranged as far as practicable to avoid risk of damage by such cargo.

(g) Each fire station hydrant or "y" branch shall be equipped with a valve so that the hose may be removed while there is pressure on the fire main.

(h) Fire station hydrant connections shall be brass, bronze, or other equivalent metal. National Standard fire hose coupling threads shall be used for the 1½-inch and 2½-inch sizes, i.e., 9 threads per inch for 1½-inch hose and 7½ threads per inch for 2½-inch hose.

(i) Fire hose shall be 50 feet in length except on weather decks the hose shall be increased in length if necessary to enable a single length to be goose-necked over each side of the vessel. If two fire mains are installed on the weather decks, the length of hose shall be such that it may be goose-necked over the side from the nearest fire main.

(j) Fire hose when part of the fire equipment shall not be used for any other purpose than fire extinguishing, fire drills, and testing.

(k) Fire hose shall be connected to outlets at all times. However, in heavy weather on open decks where no protection is afforded the hose may be removed temporarily from the hydrant and stowed in an accessible location nearby. While in port, fire hose in way of cargo area shall be kept ready for immediate use. The fire hose may be temporarily removed when it will interfere with the handling of cargo.

(l) All lined and unlined hose installed after January 1, 1961, shall be of fire hose quality, in conformance with Underwriters' Laboratories, Inc., Standard 18 or 19, or Federal Specification JJ–H–571 or ZZ–H–451a Hose which bears the label of Underwriters' Laboratories, Inc., will be accepted as conforming to this requirement.

(m) Coupling shall conform to the requirements of paragraph (h) of this section.

(n) All fire hose, including those in the engine and boiler spaces, shall be fitted with approved combination nozzles, each having a solid stream orifice of not less than ⅞-inch diameter for the 2½-inch size and not less than ⅝-inch diameter for the 1½-inch size. The nozzle shall be capable of producing a solid stream or a high velocity spray and of being shut off.

(o) There shall be approved low velocity spray applicators conveniently located for use as required by Table 34.10–10(o). Each shall have the proper connection for mating its adjacent combination nozzle.

TABLE 34.10–10(o)—LOW VELOCITY SPRAY APPLICATORS

Location	Number	Length
Living spaces	1	4 or 6 feet.
Weather decks	4	10 or 12 feet.
Machinery spaces	2	4 or 6 feet.

§ 34.10–15 Piping—T/ALL.

(a) All piping, valves and fittings shall meet the applicable requirements of Subchapter F (Marine Engineering) of this chapter.

(b) An adequate number of valves shall be installed to isolate damaged sections of piping.

(c) All distribution valves shall be marked as required by § 35.40–10 of this subchapter.

(d) Tankships of 1,000 gross tons and over on an international voyage shall be provided with at least one international shore connection. Facilities shall be available enabling such a connection to be used on either side of the vessel. The international shore connection shall be in accordance with specification Subpart 162.034 of Subchapter Q (Specifications) of this chapter.

(e) For tankships on an international voyage, the diameter of the fire main shall be sufficient for the effective distribution of the maximum required discharge from two fire pumps operating simultaneously. This requirement is in addition to § 34.10–5(b). The discharge of this quantity of water through hoses and nozzles at a sufficient number of adjacent hydrants shall be at a minimum Pitot tube pressure of approximately 50 pounds per square inch.

§ 34.10–90 Installations contracted for prior to May 26, 1965—T/ALL.

(a) Installations contracted for prior to January 1, 1962, shall meet the following requirements:

(1) Existing arrangements, materials and facilities previously approved shall be considered satisfactory so long as they meet the minimum requirements of this paragraph and they are maintained in good condition to the satisfaction of the Officer in Charge, Marine Inspection. Minor repairs and alterations may be made to the same standards as the original installation.

(2) Except as further modified by this paragraph, the details of the systems shall be in general agreement with §§ 34.10–5 through 34.10–15 insofar as is reasonable and practicable.

(3) Tankships of less than 500 gross tons shall be equipped with an efficient hand pump capable of delivering 50 gallons per minute or a power-driven pump of equivalent capacity. However, on

tankships of 20 gross tons or under where it is impracticable to install a hand or power-operated fire pump, or on tankships with only one man in the crew, at least one additional B–II fire extinguisher may be accepted in lieu of a fire pump.

(4) Tankships of 500 gross tons and over but not over 1,000 gross tons shall be provided with one independently power-driven pump.

(5) Tankships of over 1,000 gross tons shall be provided with two independently power-driven pumps.

(6) On tankships of 500 gross tons and over, the capacity of the combined fire pump installation shall be one-fifth gallon per minute per gross ton of the ship. The maximum total fire pump capacity required for any tankship shall be 800 gallons per minute.

(7) Fire pumps on tankships of 500 gross tons and over shall be capable of delivering two powerful jets of water simultaneously from the highest outlets on the fire main at a Pitot tube pressure of approximately 50 pounds per square inch through nozzles, each having an orifice of not less than ⅞-inch diameter where the internal diameter of the hose exceeds 1½ inches, and not less than ⅝-inch diameter where the internal diameter of the hose does not exceed 1½ inches.

(8) On oil-burning tankships, provided with two fire pumps, where the engine and fire rooms are not entirely separated by iron or steel bulkheads, or if fuel can drain from fireroom bilges into the engineroom, one of the fire pumps shall be located in an accessible space separate from the machinery compartment. On all tankships contracted for on or after November 19, 1952, the requirements of paragraph (f) of § 34.10–5 shall be met.

(9) Fire hydrant outlets shall have a minimum diameter of 1½ inches.

(10) On all tankships of 1,000 gross tons and over contracted for on or after July 1, 1951, but prior to January 1, 1962, the nozzles used on at least 2 hose lines in the boiler and machinery spaces shall be approved combination nozzles. In addition, an approved applicator equipped with a low velocity water spray tip, which is capable of being attached directly to the nozzle or the hose, shall be provided for each nozzle. Unless a self-cleaning strainer is contained within the nozzle itself and within the applicator where the applicator is attached directly to the hose, there shall be a self-cleaning strainer attached to the fire hydrant either directly or by means of a short length of hose, except where high and low velocity spray heads have large orifice openings.

(11) Fire hose lines in boiler and machinery spaces of vessels of 1,000 gross tons and over, contracted for prior to July 1, 1951, shall be provided with at least 2 suitable nozzles of an approved type which are capable of effectively extinguishing oil fires. Approved combination nozzles together with the applicator and low velocity spray head, will be acceptable for this purpose. The self-cleaning strainer may be fitted, but will not be required.

(12) At least 25 percent of the hydrants, exclusive of those in the boiler and machinery spaces, shall be fitted with approved combination nozzles, applicators with low velocity spray heads, and self-cleaning strainers as described in subparagraph (10) of this paragraph. Such nozzles shall be strategically located throughout the tankship.

(13) Where approved combination nozzles are used with fire lines other than required in subparagraphs (10) through (12) of this paragraph, the applicators, low velocity spray heads, and self-cleaning strainers may be fitted, but will not be required.

(14) Vessels contracted for on or after July 1, 1954, shall meet the requirements of § 34.10–10(h).

(b) Installations contracted for on or after January 1, 1962, but prior to May 26, 1965, shall meet the following requirements:

(1) Existing arrangements, materials, and facilities previously approved shall be considered satisfactory as long as they meet the minimum requirements of this paragraph and they are maintained in good condition to the satisfaction of the Officer in Charge, Marine Inspection. Minor repairs, and alterations may be made to the same standards as the original installation.

(2) The details of the systems shall be in general agreement with §§ 34.10–5 through 34.10–15 insofar as is reasonable and practicable.

Subpart 34.13—Steam Smothering System, Details

§ 34.13–1 Application—T/ALL.

(a) In accordance with § 34.05–5, steam smothering systems are not permitted on vessels contracted for on or after January 1, 1962, except as provided for under § 34.05–5(a)(2).

(b) Where a steam smothering system is already installed on a vessel contracted for prior to that date, the provisions of this subpart shall apply.

(c) This does not preclude the introduction of steam into such confined spaces as boiler casings or into tanks for steaming out purposes. Such installations are not to be considered as part of any required fire extinguishing system.

§ 34.13–90 Installations contracted for prior to January 1, 1962—T/ALL.

(a) Installations contracted for prior to January 1, 1962, shall meet the following requirements:

(1) Existing arrangements, materials and facilities previously approved will be considered satisfactory so long as they meet the minimum requirements of this paragraph and they are maintained in good condition to the satisfaction of the Officer in Charge, Marine Inspection. Minor repairs and alterations may be made to the same standard as the original installation.

(2) Steam shall be available from the main or auxiliary boilers, or from a shore source. The capacity of the steam supply shall be at least equal to one pound of steam per hour for each 12 cubic feet of the largest cargo compartment in the case of installations contracted for on or after November 19, 1952, and one pound of steam per hour for each 50 cubic feet of the largest cargo compartment in the case of installations contracted for prior to November 19, 1952.

(3) Where reasonable and practicable, the steam pressure shall be at least 100 p.s.i.

(4) The piping system shall meet the general requirements of this subparagraph insofar as is reasonable and practicable.

(i) All piping, valves, and fittings shall meet the applicable requirements of subchapter F (Marine Engineering) of this chapter. All valves and manifolds shall be marked as required by § 35.40–10.

(ii) The supply may be taken from any steam line having adequate capacity.

(iii) The distribution line to each compartment shall be fitted with a shut-off valve.

(iv) Provisions shall be made for draining the manifold and distribution lines to prevent them from freezing.

(v) The minimum size and number of branches to the various spaces shall be as given in Table 34.13–90(a)(4)(v). The distribution piping from the manifold to the branch lines shall have an area approximately equal to the combined areas of the branch lines served.

TABLE 34.13–90(a)(4)(v)

Volume of space in cubic feet		Number of branches to space	Pipe size of each branch, inches
Over—	Not over—		
----------	500	1	¾
500	5,000	1	1
5,000	15,000	1	1¼
15,000	and over	1	1½

(vi) The steam supply line to any distribution manifold shall be of sufficient size to supply all the branch lines to the largest compartment.

(vii) All controls and valves for the operation of the system shall be outside the space protected and shall not be located in any space that might be cut off or made inaccessible in the event of fire in any places protected.

(5) For the purpose of this paragraph, the term "largest cargo compartment" shall be considered as the cargo space, either liquid or dry, having the greatest volumetric measurement. In the case of liquid cargo tanks, the gross volume of the largest tank and all adjoining tanks shall be used for installations contracted for on or after November 19, 1952; for installations contracted for prior to November 19, 1952, the gross volume of the individual tanks shall be used. In the case of dry-cargo compartments, the gross volume shall be taken between adjacent watertight or firescreen bulkheads, and from tank top or lowest deck to the deckhead of the uppermost deck on which cargo may be carried, and if a trunk extends beyond such deckhead, the volume of the trunk shall be included.

(6) The valves to the tanks shall be left open at all times so that, in case of fire, it will be necessary only to open the master valve to insure a flow of steam into each tank, after which, the valves to the tanks which are not on fire may be closed; however, where the opening of such branch lines may cause contamination of cargo or cause the passage of gases or vapors between tanks or compartments, they may be kept closed.

(7) Piping for dry-cargo spaces, pump rooms, paint and lamp lockers, and similar spaces shall be run independent of the extinguishing system for the bulk cargo tanks. If this should be impracticable, valves shall be installed between the main bulk tank extinguishing system and other compartments served, such valves to be marked: "This valve to be kept closed except in case of fire."

(8) The master valve control shall be located above the uppermost complete deck having permanent means of closing all openings in the weather portions of the deck.

(9) Control valves for pumproom extinguishment systems shall be located adjacent to the pumproom exit.

(10) In pumprooms the outlets shall terminate just above the floor plates.

Subpart 34.15—Carbon Dioxide Extinguishing Systems, Details

§ 34.15–1 Application—T/ALL.

(a) Where a carbon dioxide extinguishing system is installed, the provisions of this subpart, with the exception of § 34.15–90, shall apply to all installations contracted for on or after January 1, 1962. Installations contracted for prior to January 1, 1962, shall meet the requirements of § 34.15–90.

(b) The requirements of this subpart are based on a "high pressure system," i.e., one in which the carbon dioxide is stored in liquid form at atmospheric temperature. Details for "low pressure systems," i.e., those in which the carbon dioxide is stored in liquid form at a continuously controlled low temperature, may be specifically approved by the Commandant where it is demonstrated that a comparable degree of safety and fire extinguishing ability is achieved.

§ 34.15–5 Quantity, pipe sizes, and discharge rates—T/ALL.

(a) *General.* (1) The amount of carbon dioxide required for each space shall be as determined by paragraphs (b) through (e) of this section.

(b) *Total available supply.* (1) A separate supply of carbon dioxide need not be provided for each space protected. The total available supply shall be at least sufficient for the space requiring the greatest amount.

(c) *Dry cargo spaces.* (1) The number of pounds of carbon dioxide required for each space shall be equal to the gross volume of the space in cubic feet divided by 30.

(2) Although separate piping shall be led to each cargo hold and 'tween deck, for the purpose of determining the amount of carbon dioxide required, a cargo compartment will be considered as the space between watertight or fire-screen bulkheads and from the tank top or lowest deck to the deck head of the uppermost space on which cargo may be carried. If a trunk extends beyond such deck, the trunk volume shall be included. Tonnage openings shall be considered as sealed for this purpose.

(3) Branch lines to the various cargo holds and 'tween decks shall not be less than ¾-inch standard pipe size.

(4) No specific discharge rate need be applied to such systems.

(d) *Enclosed ventilation systems for rotating electrical propulsion equipment.* (1) The number of pounds of carbon dioxide required for the initial charge shall be equal to the gross volume of the system divided by 10 for systems having a volume of less than 2,000 cubic feet, and divided by 12 for systems having a volume of 2,000 cubic feet or more.

(2) The piping for the initial charge shall be in accordance with Table 34.15–5(e)(4), and the discharge of the required amount shall be completed within 2 minutes.

(3) In addition to the above there shall be sufficient carbon dioxide available to permit delayed discharges of such quantity as to maintain at least a 25 percent concentration until the equipment can be stopped. If the initial discharge is such as to achieve this concentration until the equipment is stopped, no delayed discharge need be provided.

(4) The piping for the delayed discharge shall not be less than ½-inch standard pipe, and no specific discharge rate need be applied to such systems. On small systems, this pipe may be incorporated with the initial discharge piping.

(e) *Machinery spaces, pumprooms, paint lockers, and similar spaces.* (1) Except as provided in subparagraph (4) of this paragraph, the number of pounds of carbon dioxide required for each space shall be equal to the gross volume of the space divided by the appropriate factor noted in Table 34.15–5(e)(1). If fuel can drain from the compartment being protected to an adjacent compartment, or if the compartments are not entirely separate, the requirements for both compartments shall be used to determine the amount of carbon dioxide to be provided. The carbon dioxide shall be arranged to discharge into both such compartments simultaneously.

TABLE 34.15–5(e)(1)

Gross volume of compartment, cubic feet		Factor
Over—	Not Over—	
----------	500	15
500	1,600	16
1,600	4,500	18
4,500	50,000	20
50,000	----------	22

(2) For the purpose of the above requirement of this paragraph, the volume of a machinery space shall be taken as exclusive of the normal machinery casing unless the boiler, internal combustion propelling machinery, or fuel oil installations subject to the discharge pressure of the fuel oil service pump extend into such space, in which case the volume shall be taken to the top of the casing or the next material reduction in casing area whichever is lower. The terms "normal machinery casing" and "material reduction in casing area" shall be defined as follows:

(i) By "normal machinery casing" shall be meant a casing the area of which is not more than 40 percent of the maximum area of the machinery space.

(ii) By "material reduction in casing area" shall be meant a reduction to at least 40 percent of the casing area.

(3) For the purpose of the above requirements of this paragraph, the volume of a pumproom shall include the pumproom and all associated trunks up to the deck at which access from the weather is provided.

(4) For tankships on an international voyage contracted for on or after May 26, 1965, the amount of carbon dioxide required for a space containing propulsion boilers or internal combustion propulsion machinery shall be as given by subparagraphs (1) and (2) of this paragraph or by dividing the entire volume, including the casing, by a factor of 25, whichever is the larger.

(5) Branch lines in the various spaces shall be as noted in Table 34.15–5(e)(5).

TABLE 34.15–5(e)(5)

Maximum quantity of carbon dioxide required, pounds	Minimum pipe size, inches	Maximum quantity of carbon dioxide required, pounds	Minimum pipe size, inches
100	1½	2,500	2½
225	¾	4,450	3
300	1	7,100	3½
600	1¼	10,450	4
1,000	1½	15,000	4½
2,450	2	----------	----------

(6) Distribution piping within the space shall be proportioned from the supply line to give proper distribution to the outlets without throttling.

(7) The number, type and location of discharge outlets shall be such as to give a uniform distribution throughout the space.

(8) The total area of all discharge outlets shall not exceed 85 percent nor be less than 35 percent of the nominal cylinder outlet area or the area of the supply pipe, whichever is smaller. The nominal cylinder outlet area in square inches shall be determined by multiplying the factor 0.0022 by the number of pounds of carbon dioxide required, except that in no case shall this outlet area be less than 0.110 square inches.

(9) The discharge of at least 85 percent of the required amount of carbon dioxide shall be complete within 2 minutes.

§ 34.15–10 Controls—T/ALL.

(a) Except as noted in § 34.15–20(b), all controls and valves for the operation of the system shall be outside the space protected, and shall not be located in any space that might be cut off or made inaccessible in the event of fire in any of the spaces protected.

(b) If the same cylinders are used to protect more than one space, a manifold with normally closed stop valves shall be used to direct the carbon dioxide into the proper space. If cylinders are used to protect only one space, a normally closed stop valve shall be installed between the cylinders and the space except for systems of the type indicated in § 34.15-5(e) which contain not more than 300 pounds of carbon dioxide.

(c) Distribution piping to the dry cargo spaces shall be controlled from not more than two stations. One of the stations controlling the system for the main machinery space shall be located as convenient as practicable to one of the main escapes from the space. All control stations and the individual valves and controls shall be marked as required by § 35.40-10 of the subchapter.

(d) Systems of the type indicated in § 34.15-5(e) shall be actuated at each station by one control operating the valve to the space and a separate control releasing at least the required amount of carbon dioxide. These two controls shall be located in a box or other enclosure clearly identified for the particular space. Systems installed without a stop valve shall be operated by one control releasing at least the required amount of carbon dioxide.

(e) Where provisions are made for the simultaneous release of a given amount of carbon dioxide by operation of a remote control, provisions shall also be made for manual control at the cylinders. Where gas pressure from pilot cylinders is used as a means for releasing the remaining cylinders, not less than two pilot cylinders shall be used for systems consisting of more than two cylinders. Each of the pilot cylinders shall be capable of manual control at the cylinder, but the remaining cylinders need not be capable of individual manual control.

(f) Systems of the type indicated in § 34.15-5(e), which are of more than 300 pounds of carbon dioxide shall be fitted with an approved delayed discharge so arranged that the alarm will be sounded for at least 20 seconds before the carbon dioxide is released into the space. Such systems of not more than 300 pounds of carbon dioxide shall also have a similar delayed discharge, except for spaces which have a suitable horizontal escape.

(g) All distribution valves and controls shall be of an approved type. All controls shall be suitably protected.

(h) Complete but simple instructions for the operation of the system shall be located in a conspicuous place at or near the releasing control device.

(i) If the space or enclosure containing the carbon dioxide supply or controls is to be locked, a key to the space or enclosure shall be in a break-glass-type box conspicuously located adjacent to the opening.

§ 34.15-15 Piping—T/ALL.

(a) The piping, valves, and fittings shall have a bursting pressure of not less than 6,000 pounds p.s.i.

(b) All piping, in nominal sizes not over ¾-inch shall be at least Schedule 40 (standard weight) and in nominal sizes over ¾-inch, shall be at least Schedule 80 (extra heavy).

(c) All piping, valves, and fittings of ferrous materials shall be protected inside and outside against corrosion unless specifically approved otherwise by the Commandant.

(d) A pressure relief valve or equivalent set to relieve between 2,400 and 2,800 pounds p.s.i. shall be installed in the distributing manifold or such other location as to protect the piping in the event that all branch line shutoff valves are closed.

(e) All deadend lines shall extend at least 2 inches beyond the last orifice and shall be closed with cap or plug.

(f) All piping, valves, and fittings shall be securely supported, and where necessary, protected against injury.

(g) Drains and dirt traps shall be fitted where necessary to prevent the accumulation of dirt or moisture. Drains and dirt traps shall be located in accessible locations where possible.

(h) Piping shall be used for no other purpose except that it may be incorporated with the fire-detecting system.

(i) Piping passing through living quarters shall not be fitted with drains or other openings within such spaces.

(j) Installation test requirements are:

(1) Upon completion of the piping installation, and before the cylinders are connected, a pressure test shall be applied as set forth in this paragraph. Only carbon dioxide or other inert gas shall be used for this test.

(2) The piping from the cylinders to the stop valves in the manifold shall be subjected to a pressure of 1,000 pounds p.s.i. with no additional gas being introduced to the system, it shall be demonstrated that the leakage of the system is such as not to permit a pressure drop of more than 150 pounds per square inch per minute for 2-minute period.

(3) The individual branch lines to the various spaces protected shall be subjected to a test similar to that described in the preceding sub-paragraph with the exception that the pressure used shall be 600 pounds p.s.i. in lieu of 1,000 pounds p.s.i. For the purpose of this test, the distribution piping shall be capped within the space protected at the first joint ahead of the nozzles.

(4) In lieu of the tests prescribed in the preceding subparagraphs in this paragraph, small independent systems protecting spaces such as emergency generator rooms, lamp lockers, etc., may be tested by blowing out the piping with the air at a pressure of at least 100 pounds p.s.i.

§ 34.15-20 Carbon dioxide storage—T/ALL.

(a) Except as provided in paragraph (b) of this section, the cylinders shall be located outside the spaces protected, and shall not be located in any space that might be cut off or made inaccessible in the event of a fire in any of the spaces protected.

(b) Systems of the type indicated in § 34.15-5 (e), consisting of not more than 300 pounds of carbon dioxide, may have the cylinders located within the space protected. If the cylinder stowage is within the space protected, the system shall be arranged in an approved manner to be automatically operated by a heat actuator within the space in addition to the regular remote and local controls.

(c) The space containing the cylinders shall be properly ventilated and designed to preclude an anticipated ambient temperature in excess of 130 degrees F.

(d) Cylinders shall be securely fastened and supported, and where necessary, protected against injury.

(e) Cylinders shall be so mounted as to be readily accessible and capable of easy removal for recharging and inspection. Provisions shall be available for weighing the cylinders.

(f) Where subject to moisture, cylinders shall be so installed as to provide a space of at least 2 inches between the flooring and the bottom of the cylinders.

(g) Cylinders shall be mounted in an upright position or inclined not more than 30 degrees from the vertical. However, cylinders which are fitted with flexible or bent siphon tubes may be inclined not more than 80 degrees from the vertical.

(h) Where check valves are not fitted on each independent cylinder discharge, plugs or caps shall be provided for closing outlets when cylinders are removed for inspection or refilling.

(i) All cylinders used for storing carbon dioxide shall be fabricated, tested, and marked in accordance with the regulations of the Interstate Commerce Commission as noted in § 147.04-1 of Subchapter N (Dangerous Cargoes) of this chapter.

§ 34.15-25 Discharge outlets—T/ALL.

(a) Discharge outlets shall be of an approved type.

§ 34.15-30 Alarms—T/ALL.

(a) Spaces required to have a delayed discharge by § 34.15-10(f) which are protected by a carbon dioxide extinguishing system and are normally accessible to persons on board while the vessel is being navigated, other than paint and lamp lockers and similar small spaces, shall be fitted with an approved audible alarm in such spaces which will be automatically sounded before the carbon dioxide is admitted to the space. The alarm shall be conspicuously and centrally located and shall be marked as required by § 35.40-7 of this subchapter. Such alarms shall be so arranged as to sound during the 20-second delay period prior to the discharge of carbon dioxide into the space, and the alarm shall depend on no source of power other than the carbon dioxide.

§ 34.15-35 Enclosure openings—T/ALL.

(a) Except for cargo spaces, the operation of the carbon dioxide system shall automatically shut down any mechanical ventilation to that space. This will not be required where the carbon dioxide system is a secondary system in addition to another approved primary system protecting the space.

(b) Where natural ventilation is provided for spaces protected by a carbon

dioxide extinguishing system, provisions shall be made for easily and effectively closing off the ventilation.

(c) Means shall be provided for closing all other openings to the space protected from outside such space. In this respect, relatively tight doors, shutters, or dampers shall be provided for openings in the lower portion of the space. The construction shall be such that openings in the upper portion of the space can be closed off either by permanently installed means or by the use of canvas or other material which is normally carried by the vessel.

§ 34.15–40 Pressure relief—T/ALL.

(a) Where necessary, relatively tight compartments such as refrigeration spaces, paint lockers, etc., shall be provided with suitable means for relieving excessive pressure accumulating within the compartment when the carbon dioxide is injected.

§ 34.15–90 Installations contracted for prior to January 1, 1962—T/ALL.

(a) Installations contracted for prior to November 19, 1952, shall meet the requirements of this paragraph.

(1) Existing arrangements, materials, and facilities previously approved shall be considered satisfactory so long as they meet the minimum requirements of this paragraph and they are maintained in good condition to the satisfaction of the Officer in Charge, Marine Inspection. Minor repairs and alterations may be made to the same standards as the original installation.

(2) The details of the systems shall be in general agreement with §§ 34.15–5 through 34.15–40 insofar as is reasonable and practicable, with the exception of § 34.15–5 (e)(1) through (3) covering spaces other than cargo spaces, which systems may be installed in accordance with subparagraphs (4) through (7) of this paragraph.

(3) For cargo tanks at least one pound of carbon dioxide shall be available for each 30 cubic feet of the largest cargo tank. The discharge of the required amount of carbon dioxide shall be complete within 5 minutes.

(4) In boilerrooms, the bilges shall be protected by a system discharging principally below the floor plates. Perforated pipe may be used in lieu of discharge nozzles for such systems. The number of pounds of carbon dioxide shall be equal to the gross volume of the boiler room taken to the top of the boilers divided by 36. In the event of an elevated boilerroom which drains to the machinery space, the system shall be installed in the engineroom bilge and the gross volume shall be taken to the flat on which the boilers are installed.

(5) In machinery spaces where main propulsion internal combustion machinery is installed, the number of pounds of carbon dioxide required shall be equal to the gross volume of the space taken to the underside of the deck forming the hatch opening divided by 22.

(6) In miscellaneous spaces other than cargo or main machinery spaces the number of pounds of carbon dioxide required shall be equal to the gross volume of the space divided by 22.

(7) Branch lines to the various spaces other than cargo and similar spaces shall be noted in Table 34.15–90(a)(7). This table is based on cylinders having discharge outlets and siphon tubes of ⅜-inch diameter.

TABLE 34.15-90(a)(7)

Number of cylinders		Nominal pipe size, inches
Over—	Not over—	
----------	2	¼-standard.
2	4	¾-standard.
4	6	1-extra heavy.
6	12	1¼-extra heavy.
12	16	1½-extra heavy.
16	27	2-extra heavy.
27	39	2½-extra heavy.
39	60	3-extra heavy.
60	80	3½-extra heavy.
80	104	4-extra heavy.
104	165	5-extra heavy.

(b) Installations contracted for on or after November 19, 1952, but prior to January 1, 1962, shall meet the requirements of this paragraph.

(1) Existing arrangements, materials, and facilities previously approved shall be considered satisfactory so long as they meet the minimum requirements of this paragraph and they are maintained in good condition to the satisfaction of the Officer in Charge, Marine Inspection. Minor repairs and alterations may be made to the same standards as the original installation.

(2) The details of the systems shall be in general agreement with §§ 34.15–5 through 34.15–40 insofar as is reasonable and practicable with the exception that delayed discharges need not be provided for installations made prior to July 1, 1957.

Subpart 34.17—Fixed Foam Extinguishing Systems, Details

§ 34.17–1 Application—T/ALL.

(a) Where a fixed foam extinguishing system is installed, the provisions of this Subpart with the exception of § 34.17–90, shall apply to all installations contracted for on or after January 1, 1962.

(b) Installations contracted for prior to January 1, 1962, shall meet the requirements of § 34.17–90.

§ 34.17–5 Quantity of foam required—T/ALL.

(a) *Area protected.* (1) For machinery spaces and pumprooms, the system shall be so designed and arranged as to spread a blanket of foam over the entire tank top or bilge of the space protected. The arrangement of piping shall be such as to give a relatively uniform distribution over the entire area protected.

(2) Where an installation is made to protect an oil-fired boiler installation on a flat which is open to or can drain to the lower engineroom or other space, both the flat and the lower space shall be protected simultaneously. The flat shall be fitted with suitable coamings on all openings other than deck drains to properly restrain the oil and foam at that level. Other installations of a similar nature will be considered in a like manner.

(b) *Rate of application.* (1) The rate of discharge to foam outlets protecting the hazard shall be at least as set forth in this paragraph.

(2) For chemical foam systems with stored "A" and "B" solutions, a total of at least 1.6 gallons per minute of the two solutions shall be discharged for each 10 square feet of area protected.

(3) For other types of foam systems, the water rate to the dry-powder generators or air foam production equipment shall be at least 1.6 gallons per minute for each 10 square feet of area protected.

(c) *Supply of foam-producing material.* (1) There shall be provided a quantity of foam-producing material sufficient to operate the equipment at the minimum discharge rate specified in paragraph (b) of this section for a period of at least 3 minutes.

(d) *Separate supply of foam-producing material.* (1) A separate supply of foam-producing material need not be provided for each space protected. This includes a deck foam system. The total available supply shall be at least sufficient for the space requiring the greatest amount.

(e) *Water supply for required pumps.* (1) The water supply shall be from outside and completely independent of the space protected.

§ 34.17–10 Controls—T/ALL.

(a) The foam agent, its container, measuring devices, and other items peculiar to the system shall be of an approved type.

(b) The foam-producing material container and all controls and valves for the operation of the system shall be outside the space protected and shall not be located in such space as might be cut off or made inaccessible in the event of fire in any of the spaces protected. The control space shall be as convenient as practicable to one of the main escapes from the spaces protected, and shall be marked as required by § 35.40–10 of this subchapter. Where pumps are required, it shall not be necessary that they be started from the control space.

(c) Complete, but simple instructions for the operation of the system shall be located in a conspicuous place at or near the controls.

(d) The valves to the various spaces served shall be marked as required by § 35.40–10 of this subchapter.

§ 34.17–15 Piping—T/ALL.

(a) All piping, valves, and fittings shall meet the applicable requirements of Subchapter F (Marine Engineering) of this chapter.

(b) All piping, valves, and fittings of ferrous materials shall be protected inside and outside against corrosion unless specifically approved otherwise by the Commandant.

(c) All piping, valves, and fittings shall be securely supported, and where necessary, protected against injury.

(d) Drains and dirt traps shall be fitted where necessary to prevent the accumulation of dirt or moisture.

(e) Piping shall not be used for any other purpose than firefighting, drills and testing.

§ 34.17–20 Discharge outlets—T/ALL.

(a) Discharge outlets shall be of an approved type.

§ 34.17–25 Additional protection required—T/ALL.

(a) In order that any residual fires above the floor plates may be extinguished when a foam system is installed for the protection of machinery spaces, at least 2 fire hydrants, in addition to those required for the machinery space by Subpart 34.10, shall be installed outside of the machinery space entrance. Such hydrants shall be fitted with sufficient hose so that any part of the machinery space may be reached with at least 2 streams of water, and each hose shall be equipped with an approved combination nozzle and applicator.

§ 34.17–90 Installations contracted for prior to January 1, 1962—T/ALL.

(a) Installations contracted for prior to January 1, 1962, shall meet the following requirements:

(1) Existing arrangements, materials, and facilities previously approved shall be considered satisfactory so long as they meet the minimum requirements of this paragraph and they are maintained in good condition to the satisfaction of the Officer in Charge, Marine Inspection. Minor repairs and alterations may be made to the same standards as the original installation.

(2) The details of the systems shall be in general agreement with §§ 34.17–5 through 34.17–20, insofar as is reasonable and practicable. Installations contracted for prior to November 19, 1952, need not comply with paragraph (a)(2) of § 34.17–5 and § 34.17–25. A 6-inch blanket of foam in 3 minutes for machinery spaces and pumprooms will be considered as meeting the requirements of § 34.17–5.

(3) Where a system is installed to protect a tank, it shall be so designed and arranged as to spread a blanket of foam over the entire liquid surface of the tank within the range of usual trim. The arrangement of piping shall be such as to give a relatively uniform distribution over the entire area protected.

(4) For tanks, the rate of discharge to foam outlets protecting the hazard shall be as set forth in § 34.17–5(b), except that the value of 1 gallon per minute shall be substituted in both cases for the value of 1.6 gallons per minute. The quantity of foam provided shall be sufficient to operate the equipment for 5 minutes.

(5) On installations installed prior to November 19, 1952, a semiportable foam generator using a dry-chemical mixture or mechanical foam in conjunction with the fire lines may be substituted for the fixed system subject to the following conditions:

(i) There shall be at least one fire pump of suitable capacity available which can be operated and controlled from outside the space protected.

(ii) Stop valves shall be installed in the line so that if any portion of the fire main is ruptured, the foam generator may still be operated. Connections for at least two fire hoses shall be provided between the pump and the stop valve.

(iii) If the foam system is of the portable or semiportable type, the apparatus and chemicals shall be stored in a readily accessible place protected from the weather.

Subpart 34.20—Deck Foam System, Details

§ 34.20–1 Application—T/ALL.

(a) Where a deck foam system is installed, the provisions of this subpart, with the exception of § 34.20–90, shall apply to all installations contracted for on or after January 1, 1962.

(b) Installations contracted for prior to January 1, 1962, shall meet the requirements of § 34.20–90.

§ 34.20–3 Cargo area definition—T/ALL.

(a) For the purpose of this subpart, the term "cargo area" is defined as the maximum beam of the vessel times the total longitudinal extent of the cargo tank spaces.

§ 34.20–5 Quantity of foam required—T/ALL.

(a) *Area protected.* Systems of this type are designed to give primary protection to the spaces over the cargo tanks.

(b) *Rate of application.* The water rate of the foam production equipment shall be at least 0.016 gallons per minute for each square foot of cargo area.

(c) *Supply of foam-producing material.* There shall be provided a supply of foam-producing material sufficient to operate the equipment at the required rate of application for a period of at least 15 minutes without recharging. If this equipment operates in excess of the required rate, the supply of foam-producing material shall be increased accordingly.

(d) *Separate supply of foam-producing material.* Where the same foam-producing material may be used for this system as well as a fixed foam system, separate supplies need not be provided for each space protected. The total available supply shall be at least sufficient for the space requiring the greatest amount.

(e) *Water supply.* Suitable pumps shall be provided capable of producing the required water rate. The fire pumps required by Subpart 34.10 may be used for this purpose; however, the operation of the deck foam system shall not interfere with the simultaneous use of the fire main system.

§ 34.20–10 Controls—T/ALL.

(a) The foam agent, its container, measuring devices, and other items peculiar to this system shall be of an approved type.

(b) The foam agent container and the main controls for operating the system shall be located in a protected space not likely to be made inaccessible in the event of a fire in any portion of the cargo area.

(c) Complete, but simple instructions for the operation of the system shall be located in a conspicuous place at or near the controls.

(d) All valves shall be marked as required by § 35.40–17.

§ 34.20–15 Piping—T/ALL.

(a) All piping, valves, and fittings shall meet the applicable requirements of Subchapter F (Marine Engineering) of this chapter.

(b) All piping, valves, and fittings of ferrous materials shall be protected inside and outside against corrosion unless specifically approved otherwise by the Commandant.

(c) Piping and outlet arrangements shall be such as to permit the required rate of application to any portion of the open deck of the cargo area using the mounted and/or hand-held appliances provided. For enclosed spaces application of at least 1.6 gallons per minute water rate for each 10 square feet of the enclosed area for 5 minutes will be acceptable. For the purpose of this paragraph, it shall be assumed that all piping is damaged in way of the fire and an adequate number of valves shall be fitted for isolating damaged sections of piping.

(d) All piping, valves, and fittings shall be securely supported, and where necessary, protected against injury.

(e) Drains and dirt traps shall be fitted where necessary to prevent the accumulation of dirt or moisture.

(f) Piping shall not be used for any other purpose than firefighting, drills, and testing.

§ 34.20–20 Discharge outlets—T/ALL.

(a) Discharge outlets shall be of an approved type.

(b) Mounted and/or hand held foam appliances shall be connected to the required outlets at all times except on open decks, where the location of the outlets is such that no protection is afforded for the equipment in heavy weather.

§ 34.20–90 Installations contracted for prior to January 1, 1962—T/ALL.

(a) Installations contracted for prior to January 1, 1962, shall meet the following requirements:

(1) Existing arrangements, materials, and facilities previously approved shall

be considered satisfactory so long as they meet the minimum requirements of this paragraph and they are maintained in good condition to the satisfaction of the Officer in Charge, Marine Inspection. Minor repairs and alterations may be made to the same standards as the original installation.

(2) For installations contracted for prior to November 19, 1952, see § 34.17-90(a)(5).

(3) Installations contracted for on or after November 4, 1957, but prior to January 1, 1962, shall meet the requirements of §§ 34.20-5 through 34.20-20 insofar as is reasonable and practicable.

Subpart 34.25—Water Spray Extinguishing Systems, Details

§ 34.25-1 Application—T/ALL.

(a) Where a water spray extinguishing system is installed, the provisions of this subpart, with the exception of § 34.25-90, shall apply to all installations contracted for on or after January 1, 1964. Installations contracted for prior to January 1, 1964, shall meet the requirements of § 34.25-90.

§ 34.25-5 Capacity and arrangement—T/ALL.

(a) The capacity and arrangement shall be such as to effectively blanket the entire area of the space protected. The rate of discharge and the arrangement of piping and spray nozzles shall be such as to give a uniform distribution over the entire area protected.

(b) The spacing of the spray nozzles shall be on the basis of the spray pattern provided by the lowest pressure at any spray nozzle in the system. In no instance shall a system be designed for any spray nozzle to be operated at a pressure less than that for which it was approved. The maximum permissible height of the spray nozzle above the protected area shall not exceed that specified in its approval. Whenever there are obstructions to coverage by the spray patterns, additional spray nozzles shall be installed to provide full coverage.

(c) The water supply shall be from outside the space protected and shall in no way be dependent upon power from the space protected. The pump supplying water for the system shall either be reserved exclusively for the system or it may be one of the fire pumps, provided the capacity of the fire pump as set forth in Subpart 34.10 is increased by the required capacity of the system, so that this system may be operated simultaneously with the fire main system.

§ 34.25-10 Controls—T/ALL.

(a) There shall be one control valve for the operation of the system located in an accessible position outside the space protected. The control shall be located as convenient as practicable to one of the main escapes from the space protected, and shall be marked as required by § 35.40-18 of this subchapter. It shall not be necessary to start the pumps from the control space.

(b) Complete, but simple instructions for the operation of the system shall be located in a conspicuous place at or near the controls.

(c) The valve to the space protected shall be marked as required by § 35.40-18 of this subchapter.

§ 34.25-15 Piping—T/ALL.

(a) All piping, valves and fittings shall meet the applicable requirements of Subchapter F (Marine Engineering) of this chapter.

(b) Distribution piping shall be of materials resistant to corrosion, except that steel or iron pipe may be used if inside corrosion resistant coatings which will not flake off and clog the nozzles are applied. Materials readily rendered ineffective by heat of a fire shall not be used. The piping shall be subject to approval for each installation.

(c) All piping, valves, and fittings shall be securely supported, and where necessary, protected against injury.

(d) Drains, strainers, and dirt traps shall be fitted where necessary to prevent the accumulation of dirt or moisture.

(e) Threaded joints shall be metal to metal, with no thread compound used.

(f) Distribution piping shall be used for no other purpose.

(g) All piping shall be thoroughly cleaned and flushed before installation of the water spray nozzles.

§ 34.25-20 Spray nozzles—T/ALL.

(a) Spray nozzles shall be of an approved type.

§ 34.25-90 Installations contracted for prior to January 1, 1964—T/ALL.

(a) Installations contracted for prior to January 1, 1964, shall meet the following requirements:

(1) Existing arrangements, materials, and facilities previously approved shall be considered satisfactory so long as they meet the minimum requirements of this paragraph and they are maintained in good condition to the satisfaction of the Officer in Charge, Marine Inspection. Minor repairs and alterations may be made to the same standards as the original installation.

(2) The details of the systems shall be in general agreement with §§ 34.25-5 through 34.25-20 insofar as is reasonable and practicable.

Subpart 34.50—Portable and Semiportable Extinguishers

§ 34.50-1 Application—TB/ALL.

(a) The provisions of this subpart, with the exception of § 34.50-90, shall apply to all vessels contracted for on or after January 1, 1962.

(b) All vessels contracted for prior to January 1, 1962, shall meet the requirements of § 34.50-90.

§ 34.50-5 Classification—TB/ALL.

(a) Portable and semiportable extinguishers shall be classified by a combination letter and number symbol. The letter indicating the type of fire which the unit could be expected to extinguish, and the number indicating the relative size of the unit.

(b) The types of fire will be designated as follows:

(1) "A" for fires in ordinary combustible materials such as mattresses, piles of wood, shavings, canvas, etc., where the quenching and cooling effects of quantities of water, or solutions containing large percentages of water, are of first importance.

(2) "B" for fires in combustible or flammable liquids such as gasoline, lubricating oil, diesel oil, greases, etc., where a blanketing or smothering effect is essential.

(3) "C" for fires in electrical equipment where the use of non-conducting extinguishing agent is of first importance so that electrical shock is not experienced by the firefighter.

(c) The number designations for size will start with "I" for the smallest to "V" for the largest. Extinguishers which have a gross weight of 55 pounds or less when fully charged are considered portable. Extinguishers which have a gross weight of more than 55 pounds when fully charged are considered semiportable and shall be fitted with suitable hose and nozzle or other practicable means so that all portions of the space concerned may be reached. Examples of size graduations for some of the typical portable and semiportable extinguishers are set forth in Table 34.50-5(c).

TABLE 34.50-5(c)

Classification type (Size)	Soda-acid and water (Gallons)	Foam (Gallons)	Carbon dioxide (Pounds)	Dry chemical (Pounds)
A-II	2½	2½		
B-I		1½	4	2
B-II		2½	15	10
B-III		12	35	20
B-IV		20	50	30
B-V		40	[1] 100	[1] 50
C-I			4	2
C-II			15	10

[1] For outside use, double the amount shall be carried.

§ 34.50-10 Location—TB/ALL.

(a) Approved portable and semiportable extinguishers shall be installed in accordance with Table 34.50-10(a). The location of the equipment shall be such as in the opinion of the Officer in Charge, Marine Inspection, will be most convenient in case of emergency. Where special circumstances exist, not covered by Table 34.50-10(a), the Officer in Charge, Marine Inspection, may require such additional equipment as he deems necessary for the proper protection of the vessel.

TABLE 34.50-10(a)—PORTABLE AND SEMIPORTABLE EXTINGUISHERS

Tank ships		Area	Tank barges	
Quantity and location	Classification (see § 34.50-5)		Classification (see § 34.50-5)	Quantity and location
		Safety Areas		
1 required	C-II	Wheelhouse and chartroom area.		None required.
1 required in vicinity of exit.	C-II [1]	Radio room		None required.
		Accommodation Areas		
1 required in each main passageway on each deck, conveniently located, and so that no room is more than 75 feet from an extinguisher.	A-II or B-II	Staterooms, toilet spaces, public spaces, offices, etc., and associated lockers, storerooms, and pantries.	A-II or B-II	1 required in vicinity of exit.
		Service Areas		
1 required for each 2,500 square feet or fraction thereof, suitable for hazard involved.	B-II or C-II	Galleys	B-II or C-II	1 required, suitable for hazard involved.
1 required for each 2,500 square feet or fraction thereof, suitable for hazard involved.	A-II or B-II	Stores areas, including paint and lamp rooms.		None required.
		Machinery Area [2]		
2 required [3]	B-II and B-V [4]	Spaces containing oil fired boilers, either main or auxiliary, or any fuel oil units subject to the discharge pressure of the fuel oil service pump.	B-II	1 required.
1 required for each 1,000 B.H.P., but not less than 2 nor more than 6. [5]	B-II and B-III	Spaces containing internal combustion or gas turbine propulsion machinery.		None required.
1 required [6] [7]				
1 required in vicinity of exit. [7]	B-II	Auxiliary spaces containing internal combustion or gas turbine units.	B-II	1 required in vicinity of exit. [7] [8]
1 required in vicinity of exit [9]	C-II	Auxiliary spaces containing emergency generators.		None required.
		Cargo Areas		
1 required in lower pumproom.	B-II	Pumprooms	B-II	1 required in vicinity of exit. [8]
None required		Cargo tank area	B-II and B-V	2 required. [10] 1 required. [8] [11]

[1] Vessels not on an international voyage may substitute 2 C-I.
[2] A C-II shall be immediately available to the service generator and main switchboard areas, and further, a C-II shall be conveniently located not more than 50 feet walking distance from any point in all main machinery operating spaces. These extinguishers need not be in addition to other required extinguishers.
[3] Vessels of less than 1,000 gross tons require 1.
[4] Vessels of less than 1,000 gross tons may substitute 1 B-IV.
[5] Only 1 required for vessels under 65 feet in length.
[6] If oil burning donkey boiler fitted in space, the B-V previously required for the protection of the boiler may be substituted. Not required where a fixed carbon dioxide system is installed.
[7] Not required on vessels of less than 300 gross tons if fuel has a flashpoint higher than 110° F.
[8] Not required on vessels of less than 300 gross tons.
[9] Not required if fixed system installed.
[10] If no cargo pump on barge, only one B-II required.
[11] Manned barges of 100 gross tons and over only.

(b) For additional portable extinguishers as a substitute for sand, see § 34.55-10.

(c) Semiportable extinguishers shall be located in the open so as to be readily seen.

(d) If portable extinguishers are not located in the open or behind glass so that they may be readily seen they may be placed in enclosures together with the fire hose, provided such enclosures are marked as required by § 35.40-25 of this subchapter.

(e) Portable extinguishers and their stations shall be numbered in accordance with § 35.40-25 of this subchapter.

(f) Hand portable or semiportable extinguishers which are required on their nameplates to be protected from freezing shall not be located where freezing temperatures may be expected.

§ 34.50-15 Spare charges—TB/ALL.

(a) Spare charges shall be carried on all vessels for at least 50 percent of each size and each variety, i.e. foam, soda-acid, carbon dioxide, etc., of portable extinguisher required by § 34.50-10(a). However, if the unit is of such variety that it cannot be readily recharged by the vessel's personnel, one spare unit of the same classification shall be carried in lieu of spare charges for all such units of the same size and variety. This section does not apply to unmanned barges.

(b) Spare charges shall be so packaged as to minimize the hazards to personnel while recharging the units.

§ 34.50-90 Vessels contracted for prior to January 1, 1962—TB/ALL.

(a) Vessels contracted for prior to January 1, 1962, shall meet the following requirements:

(1) The provisions of §§ 34.50-5 through 34.50-15 shall be met with the exception that existing installations may be maintained if in the opinion of the Officer in Charge, Marine Inspection, they are in general agreement with the degree of safety prescribed by Table 34.50-10(a). In such cases, minor modifications may be made to the same standard as the original installation: *Provided*, That in no case will a greater departure from the standards of Table 34.50-10(a) be permitted than presently exists.

Subpart 34.55—Sand

§ 34.55-1 Application—TB/ALL.

(a) The provisions of this part shall apply to all vessels having oil fired boilers, either main or auxiliary.

§ 34.55-5 Amount required—TB/ALL.

(a) On vessels of over 1,000 gross tons there shall be in each space containing oil fired boilers a metal receptacle containing not less than 10 cubic feet of sand, sawdust impregnated with soda, or other approved dry materials, together with a scoop or shaker for distributing the same. On vessels of 1,000 gross tons or less, at least 5 cubic feet of such materials shall be similarly carried.

§ 34.55-10 Substitute—TB/ALL.

(a) An additional B-II portable extinguisher may be carried in lieu of the sand required by this part.

Subpart 34.60—Fire Axes

§ 34.60-1 Application—T/ALL.

(a) The provisions of this subpart shall apply to all tankships.

§ 34.60-5 Number required—T/ALL.

(a) All tankships shall carry at least the minimum number of fire axes as set forth in Table 34.60-5(a). Nothing in this paragraph shall be construed as limiting the Officer in Charge, Marine Inspection, from requiring such additional fire axes as he deems necessary for the proper protection of the tankship.

TABLE 34.60-5(a)

Gross tons		Number of axes
Over—	Not over—	
----------	50	1
50	200	2
200	500	3
500	1,000	4
1,000	----------	5

§ 34.60–10 Location—T/ALL.

(a) Fire axes shall be distributed throughout the spaces so as to be most readily available in the event of emergency.

(b) If fire axes are not located in the open, or behind glass, so that they may readily be seen, they may be placed in enclosures together with the fire hose, provided such enclosures are marked as required by § 35.40–15 of this subchapter.

PART 35—OPERATIONS

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Sec.
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AUTHORITY: The provisions of this Part 35 issued under R.S. 4405, as amended, 4417a, as amended, 4462, as amended; 46 U.S.C. 375, 391a, 416. Interpret or apply R.S. 4472, as amended, 4488, as amended, 4491, as amended, sec. 3, 68 Stat. 675; 46 U.S.C. 170, 481, 489, 50 U.S.C. 198; E.O. 11239, July 31, 1965, 30 F.R. 9671, 3 CFR, 1965 Supp. Treasury Department Orders 120, July 31, 1950, 15 F.R. 6521; 167–14, Nov. 26, 1954, 19 F.R. 8026; 167–38, Oct. 26, 1959, 24 F.R. 8857, unless otherwise noted.

Subpart 35.01—Special Operating Requirements

§ 35.01–1 Inspection and testing required when making alterations, repairs, or other such operations involving riveting, welding, burning, or like fire-producing actions—TB/ALL.

(a) The provisions of "Standard for the Control of Gas Hazards on Vessels to be Repaired," NFPA No. 306, published by National Fire Protection Association, 60 Batterymarch Street, Boston, Mass., 02110, shall be used as a guide in conducting the inspections and issuance of certificates required by this section.

(b) Until an inspection has been made to determine that such operation can be undertaken with safety, no alterations, repairs, or other such operations involving riveting, welding, burning, or like fire-producing actions shall be made:

(1) Within or on the boundaries of cargo tanks which have been used to carry flammable or combustible liquid or chemicals in bulk, or within spaces adjacent to such cargo tanks; or,

(2) Within or on the boundaries of fuel tanks; or,

(3) To pipe lines, heating coils, pumps, fittings, or other appurtenances connected to such cargo or fuel tanks.

(c) Such inspections shall be made and evidenced as follows:

(1) In ports or places in the United States or its territories and possessions, the inspection shall be made by a marine chemist certificated by the National Fire Protection Association; however, if the services of such certified marine chemist are not reasonably available, the Officer in Charge, Marine Inspection, upon the recommendation of the vessel owner and his contractor or their representative, shall select a person who, in the case of an individual vessel, shall be authorized to make such inspection. If the inspection indicates that such operations can be undertaken with safety, a certificate setting forth the fact in writing and qualified as may be required, shall be issued by the certified marine chemist or the authorized person before the work is started. Such qualifications shall include any requirements as may be deemed necessary to maintain, insofar as can reasonably be done, the safe conditions in the spaces certified, throughout the operation and shall include such additional tests and certifications as considered required. Such qualifications and requirements shall include precautions necessary to eliminate or minimize hazards that may be present from protective coatings or residues from cargoes.

(2) When not in such a port or place, and a marine chemist or such person authorized by the Officer in Charge, Marine Inspection, is not reasonably available, the inspection shall be made by the senior officer present and a proper entry shall be made in the vessel's logbook.

(d) It shall be the responsibility of the senior officer present to secure copies of certificates issued by the certified marine chemist or such person authorized by the Officer in Charge, Marine Inspection. It shall be the responsibility of the senior officer present, insofar as the persons under his control are concerned, to maintain a safe condition on the vessel by full observance of all qualifications and requirements listed by the marine chemist in the certificate.

§ 35.01–5 Sanitary condition and crew quarters—T/ALL.

(a) It shall be the duty of the master and chief engineer of every tankship to see that such vessel and crew's quarters are kept in a sanitary condition.

(b) Crew quarters shall be kept in sanitary condition by daily cleaning and removal of rubbish, and by painting at regular intervals as needed. Floors shall be maintained in good condition to facilitate cleaning. Lighting, heating, and ventilation in quarters shall be maintained in satisfactory condition: *Provided, however,* That forced ventilation when installed may be closed down during transfer of cargo.

(c) Before making any important repairs to or changes in the electrical installation, an inspection shall be made as required by § 111.05–10(f) of Subchapter J (Electrical Engineering) of this chapter, and such changes or repairs shall (1) comply with the requirements of this Subchapter J and (2) have the approval of the chief engineer. Miscellaneous electrical appliances intended to provide additional artifical lighting, entertainment, and for personal use, etc., shall also be subject to the approval of the chief engineer.

§ 35.01–10 Shipping papers—TB/ALL.

Each loaded tank vessel shall have on board a bill of lading, manifest, or shipping document giving the name of the consignee and the location of the delivery point, the kind, grades, and approximate quantity of each kind and grade of cargo, and for whose account the cargo is being handled. The tank vessel shall not be delayed in order to secure exact quantities of cargo. Such manifests or bills of lading may be made out by the master, master of the towing vessel, owner, or agent of the owner: *Provided, however,* That in the case of unmanned barges where shipping papers are not available, an entry in the logbook of the towing vessel giving the name of the shipper and location of shipping point, the name of the consignee and location of delivery point, the approximate kind, grade, and quantity of cargo in each barge of the tow, and for whose account the cargo is being handled, shall be considered as complying with the requirements of this section.

§ 35.01–15 Carriage of persons other than crew—TB/ALL.

No person not connected with the operation of a tank ship or tank barge or not having legitimate business with said vessel, shall be permitted aboard while vessel is under way unless specifically allowed by its certificate.

§ 35.01–20 Pilot ladders—T/OC.

(a) On and after May 26, 1965, every tankship which normally employs a pilot shall have an approved type ladder for the use of the pilot in addition to the ladders required by § 33.20–1(c) of this subchapter. Pilot ladder installations shall be in accordance with the following:

(1) All pilot ladders shall be approved Type I (rope suspension) or Type II (chain suspension) ladders constructed in accordance with Subpart 160.017 of Subchapter Q (Specifications) of this chapter.

(2) Suitable spreaders, a man rope, and a safety line shall be kept readily available for use in conjunction with the pilot ladder whenever circumstances may so require.

(3) When used, the ladder shall be secured in a position so that each step rests firmly against the ship's side, and so the pilot can gain safe and convenient access to the ship after climbing not more than 30 feet. Whenever the distance from sea level is more than 30 feet, access from the pilot ladder to the ship shall be by means of an accommodation ladder or other equally safe and convenient means.

(4) Arrangements shall be such that the rigging of the ladder and the embarkation and debarkation of the pilot is supervised by a responsible officer of the ship, and that handholds are provided to assist the pilot to pass safely and conveniently from the head of the ladder into the ship or onto the ship's deck.

(5) At night a light shining over the side shall be available for use, and the deck at the position where the pilot boards the ship shall be adequately lighted.

(b) Tankships contracted for prior to May 26, 1965, shall meet the requirements of this section, except as follows:

(1) Existing pilot ladders not meeting the requirements of paragraph (a)(1) of this section may be continued in service so long as they are maintained in good condition to the satisfaction of the Officer in Charge, Marine Inspection. All new or replacement ladders shall meet the applicable requirements.

§ 35.01–25 Aluminum and/or magnesium sacrificial anode installations—TB/ALL.

(a) The installation of aluminum and/or magnesium sacrificial anodes in cargo tanks utilized for the carriage of flammable or combustible liquids in bulk is prohibited.

(b) All existing installations of aluminum and/or magnesium sacrificial anodes in cargo tanks utilized for the carriage of flammable or combustible liquids in bulk shall be removed at the first available opportunity but not later than October 1, 1964.

§ 35.01–30 Reckless or negligent operation prohibited by law—TB/ALL.

(a) Subsection 13 (a) of the Act of April 25, 1940, as amended (46 U.S.C. 526*l*), reads as follows:

> No person shall operate any motorboat or any vessel in a reckless or negligent manner so as to endanger the life, limb, or property of any person. To "operate" means to navigate or otherwise use a motorboat or a vessel.

(Interpret or apply sec. 17, 54 Stat. 166, as amended; 46 U.S.C. 526p)

§ 35.01–35 Repairs and alterations to firefighting equipment—TB/ALL.

(a) No extensive repairs or alterations, except in emergency, shall be made to any fire-extinguishing apparatus, or other appliance subject to inspection, without advance notice to the Officer in Charge, Marine Inspection. Such repairs or alterations shall so far as is practicable be made with materials and tested in the manner specified within the regulations in this subchapter and Subchapter Q (Specifications) of this chapter for new construction.

(b) Emergency repairs or alterations shall be reported as soon as practicable to the Officer in Charge, Marine Inspection, where the vessel may call after such repairs are made.

§ 35.01–40 Prevention of oil pollution—TB/ALL.

(a) All tank vessels shall be so operated as to meet the requirements of the Oil Pollution Act, 1924 (33 U.S.C. 431–

437). In addition, all tank ships shall be so operated as to avoid discharging any oil, oily ballast, or tank washings which may foul the surface of the sea, within any of the prohibited zones set forth in the Oil Pollution Act, 1961 (33 U.S.C. 1001–1015).

(Sec. 8, 75 Stat. 403; 33 U.S.C. 1007. Treasury Department Order 167–46, Nov. 6, 1961, 26 F.R. 10609)

§ 35.01–45 Open hopper type barges—B/ALL.

(a) With the exception of those open hopper type barges constructed or modified in conformance with the requirements of Subpart 32.63 of this subchapter, the special operating conditions in this section apply to all other open hopper type barges carrying bulk cargoes as follows:

(1) Flammable liquids having a Reid vapor pressure in excess of 25 pounds per square inch, absolute, in independent tanks (Part 32 of this subchapter).

(2) Liquefied flammable gases (Part 38 of this subchapter).

(3) Flammable or combustible liquids having lethal characteristics (Class B or C poisons) (Part 39 of this subchapter).

(b) All open hopper type barges, while carrying in bulk any of the cargoes described in paragraph (a) of this section, shall be operated in conformance with the provisions in this section. However, the provisions in this section are not applicable to such barges when empty (not necessarily cleaned or gas-freed).

(c)(1) Except as otherwise provided in this section, no such open hopper type barge shall be placed as a lead barge in any tow. Such barges shall be placed in protected positions within the tow so that the danger from diving or swamping will be minimized. Where, due to operating conditions, compliance with this subparagraph is impossible, the provisions of subparagraph (3) of this paragraph apply. The person in charge of the towing vessel shall be responsible for compliance with this subparagraph.

(2) No such open hopper type barge shall be moved from a loading facility unless all void spaces and bilges are substantially free of water. Periodic inspections and necessary pumping shall be carried out to insure the maintenance of such water-free conditions, in order to minimize the free surface effect in both the longitudinal and transverse directions. Except when otherwise considered necessary for inspection or pumping, all hatch covers and other hull closure devices for void spaces and hull compartments shall be closed and secured at all times. In the case of unmanned barges, the person in charge of the towing vessel shall be deemed to be in charge of the barge, and all requirements to be carried out on the barge shall be carried out by or under the direction of such person.

(3) When an open hopper type barge is in an exposed position, such that protection from swamping provided by adjoining barges cannot be obtained from location within the tow alone, it shall be the responsibility of the person in charge of the towing vessel to control speed so as to insure protection against diving and swamping of the barge, having due regard to its design and freeboard, and to the operating conditions.

(d) To show that special operating requirements apply to a specific open hopper type barge, additional placards or signs shall be displayed in at least four different locations on the barge when the cargoes described in paragraph (a) of this section are carried in any form in the cargo tanks. The placards or signs shall be posted on the barge approximately amidships on each side and near the centerline of each end, facing outboard. Racks, or other suitable means, for mounting such placards or signs shall be so arranged as to provide clear visibility and shall be protected from becoming readily damaged or obscured. The placards or signs shall be at least equal in dimensions to the ICC standard tank car "Dangerous" placard (10¾ inches square or larger), and shall display a circle (10 inches in diameter or larger) with alternating quadrants of white and red, and so mounted that the red quadrants are centered on the verticle axis. The shipper and/or owner of the barge shall be responsible for the installation of the required placards or signs, including maintenance of them while such barge is in temporary storage with cargo aboard. The person in charge of the towing vessel shall be responsible for the continued maintenance of the placards or signs while such barge is in transit.

§ 35.01–50 Special operating requirements for tank barges carrying certain dangerous bulk cargoes—B/ALL.

(a) The requirements of this section shall apply to all tank barges carrying bulk cargoes as follows:

(1) Flammable liquids having a Reid vapor pressure in excess of 25 pounds per square inch, absolute, in independent tanks (Part 32 of this subchapter).

(2) Liquefied flammable gases (Part 38 of this subchapter).

(3) Flammable or combustible liquids having lethal characteristics (Class B or C poisons) (Part 39 of this subchapter).

(4) Certain flammable or combustible dangerous cargoes (Part 40 of this subchapter).

(b) All tank barges constructed or modified in conformance with the requirements of Subpart 32.63 of this subchapter are exempt from the provisions of § 35.01–45.

(c) When it is necessary to operate box or square-end barges as lead barges of tows, the person in charge of the towing vessel shall control the speed to insure protection against diving and swamping of such barges, having due regard to their design and freeboard, and to the operating conditions.

(d) All barges, while carrying in bulk any of the cargoes described in paragraph (a) of this section, shall be operated in conformance with the provisions of this section. However, the provisions of this section are not applicable to such barges when empty and gas-freed.

(e) Barges shall not be moved from a loading facility unless all bilges and void spaces (except those used for ballasting) are substantially free of water. Periodic inspections and necessary pumping shall be carried out to insure maintenance of such water-free condition in order to minimize the free surface effects, both in the longitudinal and transverse directions. Except when otherwise considered necessary for inspection or pumping, all hatch covers and other hull closure devices for void spaces and hull compartments other than cargo spaces shall be closed and secured at all times.

(f) During the time the cargo tanks contain dangerous cargoes described in paragraph (a) of this section in any amount, in the liquid or gaseous state, the barge shall be under constant surveillance.

(1) A strict watch of each unmanned barge in tow shall be maintained from the towing vessel while underway.

(2) A towing vessel engaged in transporting such unmanned barges shall not leave them unattended. When a barge is moored, but not gas free, it shall be under the observation of a watchman who may be a member of the complement of the towing vessel, or a terminal employee, or other person. Such person shall be responsible for the security of the barge and for keeping unauthorized persons off the barge. Such person shall be provided with, read, and have in his possession for ready reference the information cards required by § 35.01–55.

(g) The owner, operator, master, or person in charge of any barge carrying dangerous cargoes described in paragraph (a) of this section shall insure that, while the barge is being towed and during cargo transfer operations, the persons as required by § 31.15–5 of this subchapter and § 35.35–1 and information cards as required by § 35.01–55 are provided.

§ 35.01–55 Warning signs and information cards for those barges carrying bulk cargoes having dangerous characteristics in addition to flammability or combustibility—B/ALL.

(a) The requirements of this section shall apply to all tank barges carrying bulk cargoes as follows:

(1) Liquefied flammable gases having significant hazards other than flammability (Part 38 of this subchapter).

(2) Flammable or combustible liquids having lethal characteristics (Class B or C poisons) (Part 39 of this subchapter).

(3) Certain flammable or combustible dangerous cargoes (Part 40 of this subchapter).

(b) Warning signs shall be displayed on the vessel, port and starboard, facing outboard without obstructions, at all times except when the vessel is gas free. The warning sign shall be rectangular and a minimum of three feet wide and two feet high. It shall be of sufficient size to accommodate the required alerting information, which shall be in black block style letters and numerals (characters) at least three inches high on a white background. The minimum spac-

ing between adjacent words and lines of characters shall be two inches. The minimum spacing between adjacent characters shall be one-half inch. All characters shall have a minimum stroke width of one-half inch and shall be a minimum of two inches wide, except for the letters "M" and "W" which shall be a minimum of three inches wide, and except for the letter "I" and the numeral "1", which may be one-half inch wide. The signs shall have a two-inch minimum white border clear of characters. The signs shall be maintained legible. The alerting information shall include the following:

(1) Danger.

(2) Categories of hazards: (This shall be as listed in the classification column in § 146.04-5 in Subchapter N (Dangerous Cargoes) of this chapter, and additional descriptive terms, as applicable).

(3) Cargo identification by name: (This name shall be as listed in § 146.04-5 in Subchapter N (Dangerous Cargoes) of this chapter. If not specifically listed by name, the common chemical name as shown on the information card shall be used).

(4) Prohibitions: (Necessary prohibitions, such as "No Smoking," etc.).

(c) An information card for each cargo being transported shall be carried on the bridge or in the pilothouse of the towing vessel readily available for use by the person in charge of the watch. Such information card shall also be carried aboard the barge when it is not gas free. The minimum card size shall be 7" by 9½". The card shall have legible printing on one side only. The following data shall be listed:

(1) *Cargo identification characteristics.* Identification of the cargo as listed in § 146.04-5 in Subchapter N (Dangerous Cargoes) of this chapter and its common chemical name if the chemical name is not so specifically listed, its appearance and odor. A statement of the hazards involved and instructions for the safe handling of the cargo and, as applicable, the need for special cargo environments.

(2) *Emergency procedures.* Precautions to be observed in the event of spills, leaks, or equipment or machinery breakdown and/or uncontrolled release of the cargo into the waterway or atmosphere. Precautions to be observed in the event of exposure of personnel to toxic cargoes.

(3) *Firefighting procedures.* Precautions to be observed in the event of a fire occurring on or in the vicinity of the barge, and an enumeration of firefighting media suitable for use in case of a cargo fire.

(d) In the event that a barge is or has been loaded with two or more dangerous cargoes described in paragraph (a) of this section and until the tanks containing such cargoes have been gas-freed, the following additional requirements shall be met:

(1) A warning sign, meeting the requirements of paragraph (b) of this section and setting forth the alerting information required by paragraphs (b) (1) and (4) of this section, shall be located amidships.

(2) The warning signs, meeting the requirements of paragraph (b) of this section and setting forth the alerting information required by paragraphs (b) (2) and (3) of this section, shall be so located that each sign positively identifies the contents of each tank.

(3) An information card for each cargo (see paragraph (c) of this section) shall be carried for ready reference aboard the barge.

Subpart 35.03—Work Vests

§ 35.03-1 Application—TB/ALL.

(a) Provisions of this subpart shall apply to all tank vessels.

§ 35.03-5 Approved unicellular plastic foam work vests—TB/ALL.

(a) Buoyant work vests carried under the permissive authority of this subpart shall conform to the specifications contained in Subpart 160.053 in Subchapter Q (Specifications) of this chapter.

§ 35.03-10 Use—TB/ALL.

(a) Approved buoyant work vests are considered to be items of safety apparel and may be carried aboard tank vessels to be worn by crew members when working near or over the water under favorable working conditions. They shall be used under the supervision and control of designated ship's officers. When carried, such vests shall not be accepted in lieu of any portion of the required number of approved life preservers and shall not be substituted for the approved life preservers required to be worn during drills and emergencies.

§ 35.03-15 Shipboard stowage—TB/ALL.

(a) The approved buoyant work vests shall be stowed separately from the regular stowage of approved life preservers.

(b) The locations for the stowage of work vests shall be such as not to be easily confused with that for approved life preservers.

§ 35.03-20 Shipboard inspections—TB/ALL.

(a) Each work vest shall be subject to examination by a marine inspector to determine its serviceability. If found to be satisfactory, it may be continued in service, but shall not be stamped by a marine inspector with a Coast Guard stamp. If a work vest is found not to be in a serviceable condition, then such work vest shall be removed from the vessel. If a work vest is beyond repair, it shall be destroyed or mutilated in the presence of a marine inspector so as to prevent its continued use as a work vest.

Subpart 35.05—Officers and Crews

§ 35.05-1 Licensed officers and crews of tankships—T/ALL.

No tankship of the United States shall be navigated unless she shall have in her service and on board such complement of licensed officers and crew, including certificated lifeboatmen and certificated tankermen where required by the regulations in this subchapter, separately stated, as called for in her certificate of inspection.

§ 35.05-5 Master required on tankships—T/ALL.

There shall be a duly licensed master on board every tankship of more than 150 gross tons, whenever such tankship is under way.

§ 35.05-10 Pilot required on tankships—T/LBR.

(a) No tankship shall be navigated unless she shall have in her service and on board either a licensed master or pilot as called for in her certificate of inspection.

(b) The navigation of every tankship above 150 gross tons shall be under the control of a first-class pilot, and every such pilot shall be limited in his license to the particular service for which he is adapted.

(c) A first-class pilot or a second-class pilot who has reached the age of 21 years may act as master or pilot in charge of the navigation of a tank ship not exceeding 150 gross tons. A second-class pilot is authorized to act as pilot in charge of a watch on any tankship within the tonnage specified in his license.

§ 35.05-15 Watchman for a tank vessel—TB/ALL.

(a) *Manned tank vessel.* At least one member of the crew of a manned tank vessel shall be on board at all times except when the vessel is gas free or is moored at a dock or terminal at which watchman service is provided.

(b) *Unmanned barge.* (1) A strict watch of each unmanned barge in tow shall be maintained from the towing vessel while under way.

(2) When a barge is moored but not gas free, at least one of the following precautions shall be taken:

(i) The barge shall be under the observation of a watchman who may be a member of the complement of the towing vessel, or a terminal employee, or other competent person responsible for the security of the barge and for keeping unauthorized persons off the barge; or,

(ii) All cargo tank hatches shall be clearly marked in not less than 3-inch lettering, "DANGER—KEEP OUT," and in addition all hatch covers shall be closed and dogged down, or otherwise secured, by a tool-operated device, such as a length of pipe, so that no person can open the hatch by use of bare hands alone.

§ 35.05-20 Physical condition of crew—TB/ALL.

No person shall be engaged as a member of the crew on a tank vessel if he is known by the employer to be physically or mentally incapable of performing the duties assigned him.

§ 35.05-25 Illness, alcohol, drugs—TB/ALL.

(a) No person, known by the individual in charge of a tank vessel to be under the influence of liquor or other stimulant, or to be ill to such an extent as to unfit him for any particular service

on the tank vessel, shall be allowed to perform such service while in such condition.

(b) When a member of the crew of a tank vessel which is loading bulk cargo of Grade A, B, or C arrives at the gangway and is observed to be in an intoxicated condition, he shall not be permitted to board the vessel without escort.

Subpart 35.07—Logbook Entries

§ 35.07–1 Application—TB/ALL.

(a) Except as specifically noted, the provisions of this subpart shall apply to all tank vessels.

§ 35.07–5 Logbooks and records—TB/ALL.

(a) *General—TB/ALL.* Under various statutes or by regulations in this subchapter, specified tank vessels shall have certain logbooks or records, and, when the occasion arises, it is the duty of the master or person in charge to place therein specific entries as required by law or regulations in this subchapter.

(b) *Official Logbook—TB/OC.* R.S. 4290, as amended (46 U.S.C. 201), states: "Every vessel making voyages from a port in the United States to any foreign port, or, being of the burden of 75 tons or upward, from a port on the Atlantic to a port on the Pacific, or vice versa, shall have an Official Logbook; * * *." This Official Logbook is furnished gratuitously to masters of United States' flag vessels by the Coast Guard, as Form CG–706B or CG–706C, depending upon the number of persons employed as crew. There is printed in the first several pages of this Official Logbook various acts of Congress relating to logbooks and the entries required to be made therein. When a voyage is completed, or after a specified period of time is completed, the Official Logbooks with required entries therein shall be filed with the Officer in Charge, Marine Inspection, at or nearest the port where the vessel may be.

(c) *Logs or records—TB/ALL.* For vessels other than those required to have Official Logbooks by R.S. 4290, the owners, operators, and/or masters are to supply their own logs or records in any form desired, which will be considered to take the place of the Official Logbooks and may be used for the purpose of making entries therein as required by law or regulations in this subchapter. Such logs or records are not filed with the Officer in Charge, Marine Inspection, but shall be kept available for review by a marine inspector for a period of one year after the date to which the records refer, except for separate records of tests and inspections of firefighting equipment which shall be maintained with the vessel's logs for the period of validity of the vessel's certificate of inspection.

§ 35.07–10 Actions required to be logged—TB/ALL.

(a) *General—TB/ALL.* The actions and observations noted in this section shall be entered in the Official Logbook or in logs or records considered to take place of the Official Logbooks. This section contains no requirements which are not made in specific laws or in other regulations in this subchapter, the items being merely grouped together for convenience.

(b) *Entries—T/ALL.* Entries shall be made in the logs of tankships with respect to the following:

(1) Fire and lifeboat drills. Weekly. See § 35.10–5.

(2) Electric power-operated lifeboat winches. Once in each three months. See § 35.10–7.

(3) Draft and load line marks. For tankships of 150 gross tons and over, prior to leaving port for ocean, coastwise, and Great Lakes voyages only. See 46 U.S. Code, sections 85e and 88e, and § 35.20–5.

(4) Steering gear tests. Prior to departure, or for tank ships on voyages of less than 48 hours duration or tankships operating on lakes, bays, sounds and rivers, once every week. See § 35.20–10.

(5) Fuel oil data. Upon receipt of fuel oil on board to be used as fuel. See § 35.25–10.

(6) Line-throwing appliances. Once every three months. See § 35.10–1(c).

(7) Inspections and tests of firefighting equipment. Once every year. See § 31.10–18 of this subchapter.

(8) Operation and inspection of the emergency lighting and power systems. Once in each week that the vessel is navigated. See § 35.10–15.

(9) Cargo gear inspections: At least once a month. See § 31.37–70 of this subchapter.

(c) *Entries—B/ALL.* Entries shall be made in the records for tank barges with respect to the following:

(1) Inspections and tests of firefighting equipment. Once every year. See § 31.10–18 of this subchapter.

(2) Draft and load line marks. For tank barges of 150 gross tons and over, prior to leaving port for ocean, coastwise, and Great Lakes voyages only. See 46 U.S. Code, sections 85e and 88e.

(3) Cargo gear inspections: At least once a month. See § 31.37–70 of this subchapter.

Subpart 35.07—Logbook Entries

§ 35.07–15 Official log entries—TB/OC.

(a) On vessels where an Official Logbook is required by R.S. 4290 (46 U.S.C. 201), all items relative to the crew and passengers, as well as with respect to any casualties which may occur, shall be entered in the Official Logbook as required by this law.

Subpart 35.10—Fire and Emergency Requirements

§ 35.10–1 Station bills, muster lists, and line-throwing appliance drills—T/ALL.

(a) It shall be the duty of the master of every tankship over 500 gross tons to cause station bills and muster lists to be prepared before the vessel sails, which shall be signed by the master, who shall be responsible for their preparation. The station bills and muster lists shall be posted in conspicuous places in several parts of the tankship, particularly in the crew's quarters, and must contain full particulars of the signals which will be used for calling the crew to their stations for emergency duties. Special duties shall be allotted to each member of the crew and the muster list shall show all these special duties and indicate the station to which each man must go and the duties he has to perform. The special duties should, as far as possible, be comparable to the regular work of the individual.

(b) The duties provided for by the muster lists should include:

(1) The closing of airports, watertight doors, fire doors, and fire screens, the covers and all valves of all scuppers, sanitary and other discharges which lead through the ship's hull below the margin line, and stopping the fans and ventilating systems.

(2) The extinction of fire.

(3) The equipment of lifeboats, liferafts, and buoyant apparatus and their preparation for launching.

(c) The master of a tankship equipped with a line-carrying gun shall drill his crew in its use every 3 months, but the actual firing of the gun on the tankship shall be discretionary with the master. Each drill shall be recorded in the ship's logbook.

§ 35.10–5 Emergency signals; fire and lifeboat drills—T/ALL.

(a) The fire-alarm signals shall be a continuous blast of the whistle for a period of not less than 10 seconds supplemented by a continuous ringing of the general alarm bells for not less than 10 seconds. For dismissal from fire-alarm stations, the general alarm bells should be sounded three times, supplemented by three short blasts of the whistle. The signal for lifeboat drill or lifeboat stations shall be more than six short blasts and one long blast of the whistle, supplemented by the same signal on the general alarm bells. Where whistle signals are used to direct the handling of lifeboats they shall be as follows:

(1) To lower lifeboats, one short blast of the whistle.

(2) To stop lowering the lifeboats, two short blasts of the whistle.

(3) For dismissal from lifeboat stations, three short blasts of the whistle: *Provided,* That on river tankships the whistle signals specified herein may be made on the ship's bell.

(b) The master of any tankship may establish such other emergency signal, in addition to the above, as will provide that all the officers and all the crew of the tankship will have positive and certain notice of the existing emergency.

(c) The master may organize a squad to be used for emergency duties (other than a general emergency), or crew practices, and the nature of the signals or other means for assembling the squad remains within the discretion of the master. Such signals should not conflict with the navigational signals or the signals used for a general alarm.

(d) It shall be the duty of the Master, or the mate, or officer next in command to conduct a fire and boat drill at least once in every week. At least one such fire and boat drill shall be held within 24

hours of leaving a port if more than 25 percent of the crew have been replaced at that port. In connection with these drills it shall be the duty of such officer to call all hands to quarters and (weather permitting) exercise them in the unlashing and swinging out of the lifeboats, the closing of all hand or power operated watertight doors which are in use at sea, closing all fire doors and fire screens, the use of fire pumps, and all other apparatus for the safety of life on board of such vessels with special regard for the drill of the crew in the method of adjusting life preservers; to see that all the equipments required by law are in complete working order for immediate use; and to see that lifeboat equipment is examined at least monthly to insure that it is complete. The fact of exercise of the crew as herein contemplated, shall be entered upon the ship's logbook.

(e) This section relating to fire and lifeboat drills contemplates that such drills shall be conducted precisely as though an emergency existed. To accomplish the purpose of this section, lifeboat covers and strongbacks shall be removed, plugs or caps put in place, boat ladders secured in position for use, painters carried forward and tended so as to provide a good lead and slack to hold the boat in position under the davits when in the water. Different groups of lifeboats shall be used in turn at successive boat drills and, if practicable and reasonable, every lifeboat shall be lowered at least once every three months. The person in charge of each lifeboat or liferaft should have a list of its crew and should see that the men under his orders are acquainted with their several duties. The motor and the hand-operated propeller gear of each lifeboat shall be operated for a period of not less than 5 minutes once at least in every 7 days, in order that it may be ready for service at any time. Such operation shall be made a part of the report of such drill. The hand pumps and fire pump shall be operated long enough and a sufficient number of outlets used to insure that such equipment is in order and effectual. When oxygen-breathing apparatus, gas masks, or other special equipment is carried, certain members of the crew shall be trained in the use of the equipment.

(f) The entries in the ship's logbook relating to the exercise of the crew in fire and lifeboat drills shall state the day of the month and the hour when so exercised, length of time of the drill, numbers on the lifeboats swung out and numbers on those lowered, number of lengths of fire hose used, a statement of the condition of all fire and lifesaving apparatus, and a report of the monthly examination of the lifeboat equipment. If in any week the required fire and boat drills are not held or only partial drills are held, an entry shall be made stating the circumstances and extent of the drills held.

(g) Any neglect or omission on the part of the officer in command of such vessels to strictly enforce the provisions of this section shall be deemed cause for proceedings under the provisions of R. S. 4450, as amended (46 U. S. C. 239), looking to a suspension or revocation of the license of such officer.

(h) It shall be the duty of the master to require the officers and crew of all tankships to perform the aforesaid drills and discipline in the presence of marine inspectors at intervals sufficiently frequent to assure the said inspectors, by actual observance, that the foregoing requirements of this section are complied with by the officers and the crew.

(i) A copy of these requirements (Form CG–809) shall be furnished to each tankship to which this subpart applies. This form shall be framed under glass and posted in a conspicuous place.

§ 35.10–7 Electric power-operated lifeboat winches—T/ALL.

(a) It shall be the duty of the master to see that all lifeboat winch control apparatus, including motor controllers, emergency switches, master switches, and limit switches, are examined at least once in each 3 months. The examination shall include the removal of drain plugs and/or the opening of drain valves in such appliances to assure that the enclosures are free of water.

(b) The date of the examination required by this section and the condition of the equipment shall be noted in the Official Logbook.

§ 35.10–9 Posting placards containing instructions for launching and inflating inflatable liferafts—TB/ALL.

(a) Every vessel equipped with inflatable liferafts shall have posted in conspicuous places which are regularly accessible to the crew and/or passengers, approved placards containing instructions for launching and inflating inflatable liferafts for the information of persons on board. The number and location of such placards for a particular vessel shall be as determined necessary by the Officer in Charge, Marine Inspection.

(b) Under the requirements contained in § 160.051–6(c)(1) of Subpart 160.051 in Subchapter Q (Specifications) of this chapter, the manufacturer of approved inflatable liferafts is required to provide approved placards containing such instructions with each liferaft.

§ 35.10–15 Emergency lighting and power systems—T/ALL.

(a) Where fitted, it shall be the duty of the master to see that the emergency lighting and power systems are tested and inspected at least once in each week that the vessel is navigated to be assured that the system is in proper operating condition.

(b) Internal combustion engine driven emergency generators shall be tested under load for at least 2 hours, at least once in each month that the vessel is navigated.

(c) Storage batteries for emergency lighting and power systems shall be tested at least once in each 6-month period that the vessel is navigated to demonstrate the ability of the storage battery to supply the emergency loads for 6 hours.

(d) The date of the tests required by this section and the condition and performance of the apparatus shall be noted in the vessel's Official Logbook or in logs or records considered to take the place of the Official Logbook.

§ 35.10–20 Radio apparatus for lifeboats—T/OC.

(a) It shall be the duty of the master to require that all batteries for all fixed and portable radio apparatus for lifeboats are brought up to full charge weekly if the batteries are of a type which require recharging.

(b) In any case, the transmitter shall be tested weekly using a suitable artificial aerial.

Subpart 35.12—Placard of Lifesaving Signals and Breeches Buoy Instructions

§ 35.12–1 Application—T/OCLB.

(a) The provisions of this subpart shall apply to all vessels on an international voyage, and all other vessels of 150 gross tons or over in ocean, coastwise or Great Lakes service.

§ 35.12–5 Availability—T/OCLB.

(a) On all vessels to which this subpart applies there shall be posted in the pilothouse and readily available to the deck officer of the watch a placard (Form CG–811) containing instructions for the use of breeches buoys and the lifesaving signals set forth in Regulation 16, Chapter V, of the International Convention for Safety of Life at Sea, 1960. These signals shall be used by vessels or persons in distress when communicating with lifesaving stations and maritime rescue units.

(b) A copy of Form CG–811 shall also be conveniently posted in the engineroom and crews quarters of all vessels to which this subpart applies.

Subpart 35.15—Casualty or Accident Reports

§ 35.15–1 Notice of casualty and voyage records—TB/ALL.

(a) The owner, agent, master, or person in charge of a vessel involved in a marine casualty shall give notice as soon as possible to the nearest marine inspection office of the United States Coast Guard whenever the casualty results in any of the following:

(1) Damage to property in excess of $1,500.00.

(2) Material damage affecting the seaworthiness or efficiency of a vessel.

(3) Stranding or grounding.

(4) Loss of life.

(5) Injury causing any person to remain incapacitated for a period in excess of 72 hours; except injury to harbor workers not resulting in death and not resulting from vessel casualty or vessel equipment casualty.

(b) The notice required by paragraph (a) of this section shall show the name and official number of the vessel involved, the owner or agent thereof, the nature and probable occasion of the casualty, the locality in which it occurred, the nature and extent of injury to persons and the damage to property.

(c) In addition to the notice required by paragraph (a) of this section, the person in charge of the vessel shall, as soon as possible, report in writing and in person to the Officer in Charge, Marine Inspection, at the port in which the casualty occurred or nearest the port of first arrival: *Provided*, That when from distance it may be inconvenient to report in person it may be done in writing only. The written report required for personal accident shall be made on Form CG–924E and submitted for each individual injured and each loss of life. For all other vessel casualties the written report shall be made on Form CG–2692.

NOTE: If filed without delay, the Form CG–924E or CG–2692 may also provide the notice required by paragraph (a) of this section.

(d) The owner, agent, master, or other person in charge of any vessel involved in a marine casualty shall retain such voyage records of the vessel as are maintained by the vessel, such as both rough and smooth deck and engineroom logs, bell books, navigation charts, navigation work books, compass deviation cards, gyrocompass records, stowage plans, record of draft, aids to mariners, radiograms sent and received, the radio log and crew and passenger lists. The owner, agent, master, or other officer in charge, shall make those records available to a duly authorized Coast Guard officer or employee for examination upon request.

(e) Whenever a vessel collides with a lightship, buoy, or other aid to navigation under the jurisdiction of the Coast Guard, or is connected with any such collision, it shall be the duty of the person in charge of such vessel to report the accident to the nearest Officer In Charge, Marine Inspection. No report on Form CG–2692 is required unless one or more of the results listed in paragraph (a) of this section occurs.

(f) The master of any nuclear vessel shall immediately inform the Commandant in the event of any accident or casualty to the nuclear vessel which may lead to an environmental hazard. The master shall also immediately inform the competent governmental authority of the country in whose waters the vessel may be in, or whose waters the vessel approaches in a damaged condition.

(Interpret or apply R.S. 4450, as amended, secs. 1, 2, 49 Stat. 1544, secs 13, 17, 54 Stat. 166, as amended, sec. 10, 18 Stat. 128, as amended; 46 U.S.C. 239, 367, 526L(c), 526p, 33 U.S.C. 361)

§ 35.15–5 Reports by engineers of accidents involving boilers or machinery—T/ALL.

It shall be the duty of the engineer in charge when an accident occurs to the boilers or machinery tending to render the further use of such boilers and machinery unsafe until repairs are made to report the same to the Officer in Charge, Marine Inspection, at the port in which the accident occurred or nearest the port of first arrival, immediately upon the arrival of the tankship at the first port reached subsequent to the accident.

§ 35.15–10 Reports when a state of war exists—T/ALL.

During the period when a state of war exists between the United States and any foreign nation, communications in regard to casualties or accidents shall be handled with caution and the reports shall not be made by radio or by telegram.

Subpart 35.20—Navigation

§ 35.20–1 Notice to mariners; aids to navigation—T/OCLB.

(a) Licensed officers are required to acquaint themselves with the latest information published by the United States Coast Guard and the United States Navy regarding aids to navigation, and neglect to do so is evidence of neglect of duty. It is desirable that vessels navigating oceans and coastwise and Great Lakes waters shall have available in the pilothouse for convenient reference at all times a file of the applicable Notice to Mariners. All vessels shall have charts of the waters on which they operate for convenient reference at all times.

(b) Notice to Mariners, published weekly by the United States Coast Guard, which contains announcements and information regarding aids to navigation and charts of waters of the United States, is available for free distribution at the following places: Field offices of the U. S. Coast Guard; U. S. Coast and Geodetic Survey field stations; and the Marine Division, Custom House. Notice to Mariners, published weekly by the U. S. Navy for the correction of charts, sailing directions, light lists, and other publications, and which includes foreign waters and certain waters of the United States, is available for free distribution at the Oceanographic Office, Branch Oceanographic Offices, or any of the agencies at seaboard ports, and is also on file in the United States consulates, where it may be inspected.

§ 35.20–5 Draft of tankships—T/OC.

The master of every tankship shall, whenever leaving port, enter the maximum draft of his vessel in the logbook.

§ 35.20–10 Steering gear test—T/ALL.

On all tankships making voyages of more than 48 hours' duration, the entire steering gear, the whistle, the means of communication, and the signaling appliances between the bridge or pilothouse and engineroom shall be examined and tested by a licensed officer of the vessel within a period of not more than 12 hours before leaving port. All such vessels making voyages of less than 48 hours' duration or operating on lakes, bays, sounds, and rivers shall be so examined and tested at least once in every week. The fact and time of such examination and test shall be recorded in the ship's logbook.

§ 35.20–15 Steering orders—TB/ALL.

(a) For all tank vessels fitted with rudders, the following steering orders shall be given in the direct sense as follows:

(1) "Right rudder" shall be given only when it is intended that the wheel, the rudder blade, and the head of the ship should go to the right.

(2) "Left rudder" shall be given only when it is intended that the wheel, the rudder blade, and the head of the ship should go to the left.

(b) Where rudder indicators are provided, they shall be installed consistent with the requirements in paragraph (a) of this section.

§ 35.20–20 Master's and officer's responsibility—TB/ALL.

Nothing in this part shall exonerate any master or officer in command from the consequences of any neglect to keep a proper lookout or the neglect of any precaution which may be required by the ordinary practice of seamen or by the special circumstances of the case.

§ 35.20–25 Unauthorized lights—T/ALL.

Any master or pilot of any vessel who shall authorize or permit the carrying of any light, electric or otherwise, not required by law that in any way will interfere with distinguishing the signal lights may be proceeded against in accordance with the provisions of R. S. 4450 (46 U. S. C. 239), as amended, looking to a revocation or suspension of his license.

§ 35.20–30 Flashing the rays of a searchlight or other blinding light—T/ALL.

Flashing the rays of a searchlight or other blinding light onto the bridge or into the pilothouse of any vessel under way is prohibited. Any person who shall flash or cause to be flashed the rays of a blinding light in violation of the above may be proceeded against in accordance with the provision of R. S. 4450, as amended (46 U. S. C. 239), looking to the revocation or suspension of his license or certificate.

§ 35.20–35 Whistling—T/ALL.

Unnecessary sounding of vessel's whistle is prohibited within any harbor limits of the United States. Whenever any licensed officer in charge of any tankship shall authorize or permit such unnecessary whistling, such officer may be proceeded against in accordance with the provisions of R. S. 4450, as amended (46 U. S. C. 239), looking to a revocation or suspension of his license.

Subpart 35.25—Engine Department

§ 35.25–1 Examination of boilers and machinery by engineer—T/ALL.

It shall be the duty of an engineer when he assumes charge of the boilers and machinery of a vessel to examine the same forthwith and thoroughly. If he finds any part thereof in bad condition, he shall immediately report the facts to the master, owner, or agent, and to the nearest Officer in Charge, Marine Inspection, who shall thereupon investigate the matter, and if the former engineer has been willfully negligent in the performance of his duties, he may be proceeded against under the provisions of R.S. 4450, as amended (46 U.S.C. 239), looking to a suspension or revocation of his license.

§ 35.25–5 Repairs of boilers and unfired pressure vessels and reports of repairs or accidents by chief engineer—TB/ALL.

(a) Before making any repairs to boilers or unfired pressure vessels, the chief engineer shall submit a report covering the nature of the repairs to the Officer in Charge, Marine Inspection, at or nearest to the port where the repairs are to be made.

(b) In the event of an accident to a boiler, unfired pressure vessel, or machinery tending to render the further use of the item itself unsafe until repairs are made, or if by ordinary wear such items become unsafe, a report shall be made by the chief engineer immediately to the Officer in Charge, Marine Inspection, or if at sea, immediately upon arrival at port.

§ 35.25–10 Requirements for fuel oil—T/ALL.

(a) Oil to be used as fuel to be burned under boilers on tankships shall have a flash point of not less than 150° F. (closed cup test).

(b) It shall be the duty of the chief engineer to make an entry in the log of each supply of fuel oil received on board, stating the quantity received, the name of the vendor, and the flash point (closed cup test) for which it is certified by the vendor.

(c) It shall be the further duty of the chief engineer to draw and seal at the time the supply is received on board, a half-pint sample of each lot of fuel oil, such sample to be preserved until that particular supply of oil is exhausted.

§ 35.25–15 Carrying of excess steam—TB/ALL.

It shall be the duty of the chief engineer of any tank vessel to see that a stream pressure is not carried in excess of that allowed by the certificate of inspection, and to see that the safety valves, once set and sealed by the inspector are in no way tampered with or made inoperative except as provided in § 35.25–20.

§ 35.25–20 Breaking of safety valve seal—TB/ALL.

If at any time it is necessary to break the seal on a safety valve for any purpose, the chief engineer shall advise the Officer in Charge, Marine Inspection, at the next port of call, giving the reason for breaking the seal and requesting that the valve be examined and adjusted by a marine inspector.

Subpart 35.30—General Safety Rules

§ 35.30–1 Warning signals and signs—TB/ALL.

(a) *Red warning signals.* During transfer of bulk cargo while fast to a dock, a red signal (flag by day and electric lantern at night) shall be so placed that it will be visible on all sides. While transferring bulk cargo at anchor, a red flag only shall be displayed.

(b) *Warning sign at gangway.* (1) Warning placards should be kept at hand for display while a vessel is fast to a dock during transfer of cargo, to warn persons approaching the gangway. The placard shall state in letters not less than 2 inches high substantially as follows:

WARNING

No open lights.
No smoking.
No visitors.

(2) Where poisonous cargoes are being transferred the warning sign shall also include the word "Poison" to indicate the nature of the liquid being handled. (See Part 39 of this subchapter.)

(c) *Warning sign in radio room.* A sign shall be placed in radio room warning against the use of radio equipment during transfer of Grade A, B, or C liquids, except by permission of senior deck officer.

(d) Additional warning signs required by cargoes having significant hazards other than flammability or combustibility are described in § 35.01–55.

(e) Additional placards or signs required in connection with the movement of certain open hopper type barges are described in § 35.01–45.

§ 35.30–5 Fires, matches, and smoking—TB/ALL.

(a) *General.* In making the determinations required under paragraphs (b), (c), and (d) of this section the senior deck officer on duty, who shall be a licensed officer or certificated tankerman, shall exercise his skill and experience with due regard to attendant conditions and circumstances, including consideration for location of shore side facilities, maintenance of mobility, provision for fire protection, state or change of winds, tides, sea, weather conditions, forces of nature and other circumstances generally beyond human control.

(b) *Boiler fires.* Boiler fires are normally permitted during cargo transfer operations: *Provided,* That prior to loading Grades A, B, and C cargoes, the senior deck officer on duty, who shall be a licensed officer or certificated tankerman, shall make an inspection to determine whether in his judgment boiler fires may be maintained with reasonable safety during the loading operation.

(c) *Galley fires.* Galley fires are normally permitted during cargo transfer operations: *Provided,* That prior to loading Grades A, B, and C cargoes the senior deck officer on duty, who shall be a licensed officer or certificated tankerman, shall make an inspection to determine whether in his judgment galley fires may be maintained with reasonable safety during the loading operation.

(d) *Smoking.* Smoking is prohibited on the weather decks of tank vessels when they are not gas free or are alongside docks. At other times and places the senior deck officer on duty, who shall be a licensed officer or certificated tankerman, shall designate when and where the crew may smoke: *Provided,* That prior to loading Grade A, B, or C cargo the master or senior deck officer on duty shall make an inspection to determine if and where, in his judgment, smoking may be permitted with reasonable safety during the loading operation.

(e) *Matches.* The use of other than safety matches is forbidden aboard tank vessels at all times.

§ 35.30–10 Cargo tank hatches, ullage holes, and Butterworth plates—TB/ALL.

No cargo tank hatches, ullage holes, or Butterworth plates shall be opened or shall remain open without flame screens, except under the supervision of the senior members of the crew on duty, unless the tank opened is gas free.

§ 35.30–15 Combustible gas indicator—TB/ALL.

(a) The provisions of this section shall apply only to United States flag vessels.

(b) Manned tank barges and tankships authorized to carry Grade A, B, C, or D liquids at any temperature, or Grade E liquids at elevated temperatures, shall be provided with a combustible gas indicator suitable for determining the presence of explosive concentrations of the cargo carried. An indicator which bears the label of Underwriters' Laboratories, Inc., Factory Mutual Engineering Division, or other organizations acceptable to the Commandant will be accepted as meeting this requirement.

§ 35.30–20 Emergency equipment—TB/ALL.

(a) All manned tank vessels having tanks which exceed 15 feet in depth, measured from the deck to the lowest point at which cargo is carried, all tankships on an international voyage, and all tankships of 1,000 gross tons and over shall be provided with an outfit as follows:

(1) One approved fresh air breathing apparatus, including belt and lifeline. The length of the airhose shall be sufficient to reach from the open deck, well clear of hatch or doorway, to any part of the holds, tanks, and, except as provided in the following subparagraph, the machinery spaces.

(2) If it is not practicable to reach all portions of the machinery space with the airhose of the fresh air breathing apparatus, an approved self-contained breathing apparatus with adequate lifeline shall be carried for use in the machinery space. In such case, the particular apparatus provided for the machinery space shall be used for no other purpose, shall be marked indicating the restriction to its use, and shall be stowed convenient to, but outside of the machinery space.

(3) One approved 3-cell, explosion-proof flashlight, constructed in accordance with Subpart 161.008 of Subchapter Q (Specifications) of this chapter.

(4) One fire ax.

(b) Approved self-contained breathing apparatus with adequate lifelines may be provided in addition to the equipment required in the preceding paragraph, and may be used in any space on the vessel.

(c) For tankships on an international voyage, lifelines shall be of steel or bronze wire rope. Steel wire rope shall be either inherently corrosion resistant or made so by galvanizing or tinning.

Each end shall be fitted with a hook with keeper having a throat opening which can be readily slipped over a ⅝-inch bolt. The total length of the lifeline shall be dependent upon the size and arrangement of the vessel, and more than one line may be hooked together to achieve the necessary length. No individual length of lifeline may be less than 50 feet in length. The assembled lifeline shall have a minimum breaking strength of 1,500 pounds.

§ 35.30–25 Explosives—TB/ALL.

Fulminates or other detonating compounds in bulk in dry condition; explosive compositions that ignite spontaneously or undergo marked decomposition when subjected for forty-eight consecutive hours to a temperature of 167° F. or more; compositions containing an ammonium salt and a chlorate; and other like explosives shall not be accepted, stored, stowed or transported on board tank vessels.

§ 35.30–30 Portable electrical equipment—TB/ALL.

Illumination may be obtained in any compartment by the use of approved explosion-proof, self-contained, battery-fed lamps. Otherwise, no portable electrical equipment of any type shall be used in bulk cargo tanks, fuel oil tanks, cargo pumprooms, or enclosed spaces immediately above or adjacent to bulk cargo tanks unless all the following conditions are met:

(a) The compartment itself is gas-free;

(b) The compartments adjacent and the compartments diagonally adjacent are either (1) gas-free, (2) inerted, (3) filled with water, (4) contain Grade E liquid and are closed and secured, or (5) are spaces in which flammable vapors and gases normally are not expected to accumulate; and

(c) All other compartments of the vessel in which flammable vapors and gases may normally be expected to accumulate are closed and secured.

§ 35.30–35 Spark producing devices—TB/ALL.

(a) Where Grades A, B, C, and D liquid cargoes are involved, power driven or manually operated spark producing devices shall not be used in bulk cargo tanks, fuel oil tanks, cargo pumprooms, or enclosed spaces immediately above or adjacent to bulk cargo tanks unless all the following conditions are met:

(1) The compartment itself is gas-free;

(2) The compartments adjacent and the compartments diagonally adjacent are either (i) gas-free, (ii) inerted, (iii) filled with water, (iv) contain Grade E liquid and are closed and secured, or (v) are spaces in which flammable vapors and gases normally are not expected to accumulate; and,

(3) All other compartments of the vessel in which flammable vapors and gases may normally be expected to accumulate are closed and secured.

(b) This section does not prohibit the use of small hand tools in such locations.

§ 35.30–40 Flammable liquid and gas fuels as ship's stores—TB/ALL.

(a) Flammable liquids and gases to be used as fuels for industrial trucks, lifeboats and other approved equipment shall be marked, labeled and stowed as follows:

(1) They shall be stowed in ICC specification containers, A.S.M.E. containers, or portable safety containers having the approval of a recognized testing laboratory, which containers are authorized for the contents.

(2) Containers shall be marked with the name of contents and shall be labeled in accordance with ICC requirements as follows:

(i) Flammable liquids—"Red Label"; or,

(ii) Flammable gases—"Red Gas label".

(3) Containers shall be stowed on or above the weather deck in locations designated by the master. ICC specification containers, A.S.M.E. containers, or portable safety containers having the approval of a recognized testing laboratory may be stowed below the weather deck in a paint or lamp locker provided such containers do not exceed 5 gallons capacity each.

(b) Diesel fuel shall be stowed in locations designated by the master.

§ 35.30–45 Motion picture film—TB/ALL.

(a) Only acetate or slow-burning film may be used. Nitrocellulose film is specifically prohibited.

Subpart 35.35—Cargo Handling

§ 35.35–1 Men on duty—TB/ALL.

(a) A sufficient number of the crew shall be on duty to perform cargo transfer operations.

(b) In the case of unmanned barges, the owners, masters or persons in charge of such barges shall insure that a person holding a valid license as master, mate, pilot, or engineer, or a certificated tankerman is on duty to perform transfer operations, which licensed person or certificated tankerman shall be considered as the person in charge of the unmanned tank barge. Where the bulk liquid cargo to be transferred is covered by the requirements of § 35.01–55, the Officer in Charge, Marine Inspection, shall be furnished satisfactory documentary evidence that such person is trained in, and capable of performing competently, the necessary operations which relate to the transfer of such cargo.

§ 35.35–5 Electric bonding—T/ALL.

A tank vessel may be electrically connected to the shore piping, through which the cargo is to be transferred, prior to the connecting of a cargo hose. This electrical connection, if made, shall be maintained until after the cargo hose has been disconnected and any spillage has been removed.

§ 35.35–10 Closing of scuppers and sea valves—TB/ALL.

Deck officer in charge shall see that all scuppers are properly plugged during transfer operations except on tank vessels using water for deck cooling. Sea valves shall be closed and lashed, or sealed to indicate that they should not be open during all cargo loading operations. Under no circumstances shall such valves be secured by locks.

§ 35.35–15 Connecting for cargo transfer—TB/ALL.

(a) Movement of the vessel shall be considered when making the cargo connections to insure safe cargo transfer. Suitable material shall be used in joints and in couplings when making connections to insure that they are tight. Under no circumstances shall less than three bolts be used in a bolted flanged coupling.

(b) When cargo connections are supported by ship's tackle, the senior deck officer on duty shall determine the weights involved in order to insure that sufficient tackles are used.

(c) Pans or buckets shall be placed under cargo hose connections on the tank vessel.

§ 35.35–20 Inspection prior to transfer of cargo—TB/ALL.

Prior to the transfer of cargo, the senior deck officer on duty, who shall be a licensed officer or certificated tankerman, shall inspect the vessel to assure himself that the following conditions exist:

(a) Warnings are displayed as required.

(b) No repair work in way of cargo spaces is being carried on without his permission.

(c) Cargo connections have been made as described in § 35.35–15 and cargo valves are set.

(d) All cargo connections for the loading of Grades A, B, and C cargoes have been made to the vessel's pipelines and not through open end hose in a hatch.

(e) In loading Grades A, B, and C cargoes, there are no fires or open flames present on the deck, or in any compartment which is located on, facing, open, and adjacent to that part of the deck on which cargo connections have been made.

(f) The shore terminal or the other tank vessel concerned has reported itself in readiness for transfer of cargo.

(g) All sea valves connected to the cargo piping system are closed.

(h) In loading Grades A, B, and C cargoes, that an inspection has been made to determine whether boiler fires can be maintained with reasonable safety.

(i) In loading Grades A, B, and C cargoes, that an inspection has been made to determine whether galley fires can be maintained with reasonable safety.

(j) In loading Grades A, B, and C cargoes, that an inspection has been made to determine whether smoking may be permitted with reasonable safety.

(k) On tankships the construction or conversion of which is started on or after July 1, 1951, which are to load or discharge Grade A cargo, all openings in the top of the tanks, except the branch vent lines and covers to ullage hole

sounding pipes, are tightly closed. (See §§ 32.20–20 and 32.55–20 of this subchapter.)

(l) On tankships the construction or conversion of which is started on or after July 1, 1951, which are to load or discharge Grade A cargo, the method for determining the liquid level in the tank without opening ullage holes, cargo hatches or Butterworth plates is in proper order. (See § 32.20–20 of this subchapter.)

§ 35.35–25 Approval to start transfer of cargo—TB/ALL.

When the senior deck officer on duty has assured himself that the requirements of §§ 35.35–20 and 35.35–30 have been met, he may give his approval to start operations.

§ 35.35–30 "Declaration of Inspection" for tankships—T/ALL.

After completing the inspection required by § 35.35–20 and prior to giving his approval to start the cargo transfer operation, the master or senior deck officer on duty shall fill in the following Declaration of Inspection in duplicate. The original of the Declaration of Inspection shall be kept aboard for the information of authorized persons. The duplicate, where required, shall be handed to the terminal superintendent or his representative, who shall on demand be given the opportunity to satisfy himself that the condition of the vessel is as stated in the Declaration of Inspection.

DECLARATION OF INSPECTION PRIOR TO BULK CARGO TRANSFER

Date _____

S _____ Port of _____

I, _____, being the master or senior deck officer in charge of the transfer of bulk flammable and combustible cargo about to be undertaken, do certify that I have personally inspected this vessel with reference to the following requirements set forth in § 35.35–20 and that opposite each of them I have indicated that the regulations have been complied with.

(1) Are warnings displayed as required?

(2) Is there any repair work in way of cargo spaces being carried on for which permission has not been given?

(3) Have cargo connections been properly made and are cargo valves properly set?

(4) Have all cargo connections for loading Grades A, B, and C cargoes been made to vessel's pipelines?

(5) Are there any fires or open flames present on the deck or in any compartment which is located on, facing, open and adjacent to the main deck of the vessel on which the cargo connections have been made?

(6) Has the shore terminal or other tank vessel concerned reported itself in readiness for transfer of cargo?

(7) Are sea valves connected to the cargo system closed?

(8) If Grades A, B, and C cargoes are to be loaded and boiler fires are lighted, has an inspection been made to determine that they may be operated with reasonable safety?

(9) If Grades A, B, and C cargoes are to be loaded and galley fires are lighted, has an inspection been made to determine that they may be operated with reasonable safety?

(10) If Grades A, B, and C cargoes are to be loaded, has an inspection been made to determine whether smoking is to be permitted?

(11) If smoking is to be permitted, have spaces been designated for this purpose?

§ 35.35–35 Duties of senior deck officer during transfer operations—TB/ALL.

The senior deck officer on duty shall control the operations as follows:

(a) Supervise the operations of cargo system valves.

(b) Start transfer of cargo slowly.

(c) Observe cargo connections for leakage.

(d) Observe operating pressure on cargo system.

(e) Observe rate of loading for the purpose of avoiding overflow of tanks.

§ 35.35–40 Conditions under which transfer operations shall not be commenced or if started shall be discontinued—TB/ALL.

Cargo transfer operations shall not be started or, if started, shall be discontinued under the following conditions:

(a) During severe electrical storms.

(b) If a fire occurs on the wharf or on the tanker or in the vicinity.

§ 35.35–42 Restrictions on vessel coming alongside a tank vessel while loading Grade A, B, or C cargo—TB/ALL.

(a) No vessel shall come alongside or remain alongside a tank vessel in way of its cargo tanks while it is loading Grade A, B or C cargo without having the permission of the officer-in-charge of the vessel which is loading.

(b) No vessel shall come alongside or remain alongside a tank vessel in way of its cargo tanks while it is loading Grade A, B or C cargo unless the conditions then prevailing are mutually acceptable to the officers-in-charge of cargo handling on both vessels.

§ 35.35–45 Auxiliary steam, air, or electric current—B/ALL.

When discharging cargo from one or more barges, the towing vessel may furnish steam, air, or electric current for pumps on barges or dock, but in no case shall the cargo pass through or over the towing vessel.

§ 35.35–50 Termination of transfer operations—TB/ALL.

(a) When transfer operations are completed the valves on cargo connections on the vessel shall be closed. The cargo connections shall be drained of cargo.

§ 35.35–55 Transfer of other cargo or stores on tank vessels—TB/ALL.

(a) Package goods, freight, and ships' stores shall not be loaded or discharged during the loading of Grade A, B, or C products except by permission of the senior deck officer on duty. Explosives as cargo shall not be loaded or carried on any tank vessel containing Grade A, B, or C cargo.

(b) Where package and general cargo is carried directly over bulk cargo tanks, it shall be properly dunnaged to prevent chafing of metal parts and securely lashed or stowed.

§ 35.35–60 Transportation of other cargo or stores on tank barges—B/ALL.

(a) Tank barges may be permitted to transport deck cargoes directly over bulk cargo spaces when the nature of such deck cargoes and the methods of loading and unloading same do not create an undue hazard. Such tank barges shall have their decks properly dunnaged to prevent chafing between the steel parts of the vessel and the deck cargo.

§ 35.35–70 Maintenance of cargo handling equipment—TB/ALL.

The cargo handling equipment shall be maintained by the tank vessel's personnel in accordance with the regulations in this subchapter, including the following:

(a) Cargo hose shall not be used in transfer operations in which the pressures are such that leakage of cargo occurs through the body of the hose.

(b) Cargo pump relief valves shall be tested at least once each year to determine that they function satisfactorily at the pressure at which they are set to open.

(c) Cargo pump pressure gage shall be tested at least once a year for accuracy.

(d) The cargo discharge piping of all tank vessels shall be tested at least once each year for tightness, at the maximum working pressure.

§ 35.35–75 Emergencies—TB/ALL.

In case of emergencies nothing in the regulations in this subchapter shall be construed as preventing the senior officer present from pursuing the most effective action in his judgment for rectifying the conditions causing the emergency.

Subpart 35.40—Marking of Fire and Emergency Equipment

§ 35.40–1 General alarm contact maker—TB/ALL.

Each general alarm bell contact maker located as required in § 32.25–1(b) shall be marked with lettering on a corrosion-resistant plate, or with a sign in red letters on a suitable background with the words "GENERAL ALARM."

§ 35.40–5 General alarm bells—TB/ALL.

General alarm bells shall be marked in not less than ½-inch red letters: "General Alarm—When Bell Rings Go to Your Station."

§ 35.40–6 Emergency lights—TB/ALL.

(a) All emergency lights shall be marked with a letter "E" at least ½ inch high.

§ 35.40–7 Carbon dioxide alarm—T/ALL.

Adjacent to all carbon dioxide fire extinguishing alarms installed after November 19, 1952, there shall be conspicuously marked: "WHEN ALARM SOUNDS VACATE AT ONCE. CARBON DIOXIDE BEING RELEASED."

§ 35.40–10 Steam, foam, or CO_2 fire smothering apparatus—TB/ALL.

Steam, foam or CO_2 fire smothering apparatus shall be marked "STEAM FIRE APPARATUS" or "FOAM FIRE APPARATUS" or "CO_2 FIRE APPARATUS," as appropriate, in not less than 2-inch red letters. The valves of all branch pipes leading to the several compartments shall be distinctly marked to indicate the compartments or parts of the vessel to which they lead.

§ 35.40–15 Fire hose stations—TB/ALL.

At each fire hose valve there shall be marked in not less than 2-inch red letters and figures "FIRE STATION 1," 2, 3, etc.

§ 35.40–17 Foam hose/monitor stations—T/ALL.

(a) At each required foam hose/monitor valve there shall be marked in not less than 2-inch red letters and figures: "FOAM STATION 1," 2, 3, etc.

§ 35.40–18 Water spray systems—TB/ALL.

(a) Water spray system apparatus shall be marked: "WATER SPRAY SYSTEM," as appropriate, in not less than 2-inch red letters.

(b) The control valve, and its control if located remotely, shall be distinctly marked to indicate the compartment protected.

§ 35.40–20 Emergency equipment—TB/ALL.

Lockers or spaces where emergency equipment is stowed shall be marked: "EMERGENCY EQUIPMENT" or "FRESH AIR BREATHING APPARATUS" as appropriate.

§ 35.40–25 Fire extinguishers—TB/ALL.

Each fire extinguisher shall be marked with a number and the location where stowed shall be marked in corresponding numbers in at least ½ inch figures.

§ 35.40–30 Instructions for changing steering gear—TB/ALL.

Instructions in at least ½ inch letters and figures shall be posted in the steering engineroom, relating in order, the different steps to be taken in changing to the emergency steering gear. Each clutch, gear wheel, lever, valve or switch which is used during the changeover shall be numbered or lettered on a brass plate or painted so that the markings can be recognized at a reasonable distance. The instructions shall indicate each clutch or pin to be "in" or "out" and each valve or switch which is to be "opened" or "closed" in shifting to any means of steering for which the vessel is equipped. Instructions shall be included to line up all steering wheels and rudder amidship before changing gears.

§ 35.40–35 Rudder orders—TB/ALL.

At all steering stations, there shall be installed a suitable notice on the wheel or device or in such other position as to be directly in the helmsman's line of vision, to indicate the direction in which the wheel or device must be turned for "right rudder" or "left rudder."

§ 35.40–40 Vessel's name on equipment—TB/ALL.

(a) The equipment of all tank vessels, such as fire hose, fire axes, lifeboats, life rafts, life preservers and buoyant apparatus, shall be painted or branded with the name of the vessel upon which they are used, except that inflatable liferafts shall be marked in accordance with § 33.25–10.

(b) For vessels on an international voyage, in addition to other markings required, the port of registry of the vessel shall be marked on all lifeboats, rigid liferafts, buoyant apparatus, and ring life buoys. On lifeboats, the name of the vessel and the port of registry shall be marked on each side of the bow.

Subpart 35.70—Power-Operated Industrial Trucks

§ 35.70–1 Application—TB/ALL.

(a) *Power-operated industrial trucks.* (1) Power-operated industrial trucks when carried on board vessels as part of the vessel's equipment for handling materials of any kind shall be in compliance with the applicable provisions of this subpart.

(2) Power-operated industrial trucks placed on board vessels for handling materials of any kind shall be in compliance with the applicable provisions of this subpart when such vessels are within the navigable waters of the United States, its territories and possessions but not including the Panama Canal Zone.

(b) *Vessels.* (1) Vessels shall be in compliance with the applicable provisions of this Subpart during those periods of time when power-operated industrial trucks are on board as a part of the vessel's equipment or when such trucks are placed on board for handling materials of any kind.

NOTE: As set forth in § 30.01–5(e), the regulations in this subpart are also applicable to foreign flag tank vessels.

§ 35.70–3 Alternates—TB/ALL.

(a) In cases of undue hardship resulting from unavoidable delays in bringing existing power-operated industrial trucks into compliance with the applicable provisions of this subpart, the Commandant may permit the use of alternate equipment, apparatus, or arrangement for such period of time, and to such extent, and upon such conditions as will assure, to the Commandant's satisfaction, a degree of safety consistent with the minimum standards as set forth in this subpart.

(b) The methods and procedures adopted in connection with the modification of existing equipment to meet required laboratory designations will be taken into consideration in granting permission to use alternate arrangements for a limited period of time.

§ 35.70–5 Definitions of terms used in subpart—TB/ALL.

(a) Power-operated industrial trucks are considered to be tractors, lift trucks and other specialized industrial trucks used for material handling on board a vessel.

(b) For the purposes of the regulations in this subpart, the words "flammable" and "inflammable" are interchangeable or synonymous terms.

§ 35.70–7 Approved power-operated industrial trucks—TB/ALL.

(a) Where approved power-operated industrial trucks are required by the regulations in this subchapter, such approved trucks shall have a specific designation of a recognized testing laboratory except in case of trucks powered by compressed air. The following laboratories are recognized for the specific type designations listed:

(1) Underwriters' Laboratories, Inc. (Mailing address, P.O. Box 247, Northbrook, Ill., 60062) for trucks having recognized testing laboratory type designations E, EE, EX, G, GS, LP, LPS, D, and DS.

(2) Factory Mutual Laboratories, Engineering Division, 1115 Boston-Providence Turnpike, Norwood, Mass., 02062, for trucks having recognized testing laboratory type designations E, EE, EX, G, GS, LP, LPS, D, and DS.

(b) Trucks powered by compressed air which is received through a flexible hose from a fixed source and having the air supply hose of the grounded type shall be considered of the approved type for purposes of this subpart.

(c) Description of recognized testing laboratory type designations are as follows:

(1) The "E" designated units are electrically powered units that have minimum acceptable safeguards against inherent fire hazards.

(2) The "EE" designated units are electrically powered units that have, in addition to all of the requirements for the "E" units, the electric motors and all other electrical equipment completely enclosed. In certain locations the "EE" unit may be used where the use of an "E" unit may not be considered safe.

(3) The "EX" designated units are electrically powered units that differ from the "E" and "EE" units in that the electrical fittings and equipment are so designed constructed and assembled that the units may be used in certain atmospheres containing flammable vapors or dusts.

(4) The "G" designated units are gasoline powered units having minimum acceptable safeguards against inherent fire hazards.

(5) The "GS" designated units are gasoline powered units that are provided with additional safeguards to the exhaust, fuel and electrical systems. They may be used in some locations where the use of a "G" unit may not be considered safe.

(6) The "LP" designated units are similar to the "G" units except that they are liquefied petroleum gas engine powered instead of gasoline powered.

(7) The "LPS" designated units are units similar to the "GS" units except that liquefied petroleum gas is used for fuel instead of gasoline.

(8) The "D" designated units are units similar to the "G" units except that they are diesel engine powered instead of gasoline engine powered.

(9) The "DS" designated units are diesel powered units that are provided with additional safeguards to the exhaust, fuel and electrical systems. They may be used in some locations where a "D" unit may not be considered safe.

(d) In addition to the construction and design safety features required in order to obtain a recognized laboratory type designation, approved power-operated industrial trucks shall have at least the following minimum safety features where applicable.

(1) Power-operated industrial trucks shall be equipped with a warning horn, whistle, or gong, or other device that can be heard clearly above the normal shipboard noises.

(2) Wherever power-operated industrial truck operation exposes the operator to danger from falling objects, the truck shall be equipped with a driver's overhead guard. Where overall height of the truck with forks in the lowered position is limited by head room conditions the overhead guard may be omitted.

NOTE: This overhead guard is only intended to offer protection from the impact of small packages, boxes, bagged material, etc., representative of the job application. It is impractical to build a guard of sufficient strength to withstand the impact of a capacity load since such a guard would constitute a safety hazard because its structure would be so large that it might interfere with good visibility and would weigh so much that it might make the truck top-heavy and unstable.

(3) Power-operated fork lift trucks which handle small objects or unstable loads shall be equipped with a vertical load back rest or rack which shall have height, width and strength sufficient to prevent the load, or part of it, from falling toward the mast when the mast is in a position of maximum backward tilt.

(4) The forks on power-operated fork lift trucks shall be secured to the carriage so that unintentional lifting of the toe shall not occur on such application where this lifting may create a hazard. The factor of safety of forks shall be at least 3 to 1, based on the elastic limit of the material.

(5) Fork extensions or other attachments shall be suitably secured to prevent unintentional lifting or displacement on primary forks.

(6) All exposed wheels shall be provided with guards to prevent the wheels from throwing particles at the operator.

(7) Unless the steering mechanism is of a type that prevents road reactions from causing the steering handwheel to spin, the steering knob, if used, shall be of a mushroom type to engage the palm of the operator's hand, or shall be arranged in some other manner to prevent injury. The knob shall be mounted within the perimeter of the wheel.

(8) All steering controls shall be confined within the clearances of the truck, or so guarded that movement of the controls shall not result in injury to the operator when passing obstructions, stanchions, etc.

§ 35.70–10 Permissible areas of use—TB/ALL.

(a) When the area on deck or in the hold in which power-operated industrial trucks are to be used has no bulk cargo vapors when tested but is an area in which such vapors could accumulate, these trucks may be used subject to the following conditions:

(1) Trucks used shall be suitable for type of cargo to be handled in accordance with § 35.70–15.

(2) Trucks used shall be suitable for areas in which vapors could accumulate in accordance with Table 35.70–10(a).

TABLE 35.70-10(a)

Type of truck	Grade of bulk cargo/vapors in vessel				
E					E
EE		B	C	D	E
EX	A	B	C	D	E
LP					E
LPS		B	C	D	E
G					E
GS		B	C	D	E
D					E
DS		B	C	D	E
Compressed air	A	B	C	D	E

(b) When a vessel is gas free, any approved truck can be used in any space except for restrictions as to types of cargo handled as specified in § 35.70–15.

§ 35.70–15 Types of cargo permitted to be handled by trucks—TB/ALL.

(a) Power-operated industrial trucks used for handling of packaged petroleum products shall be in accordance with Table 35.70–15(a).

TABLE 35.70-15(a)

Type of truck	Grade of packaged petroleum product				
E				D	E
EE		B	C	D	E
EX	A	B	C	D	E
LP				D	E
LPS		B	C	D	E
G				D	E
GS		B	C	D	E
D				D	E
DS		B	C	D	E
Compressed air	A	B	C	D	E

(b) Where dry cargo other than packaged petroleum products is to be handled by power-operated industrial trucks on board a tank vessel, types of trucks used shall be in accordance with § 97.70–10 of Subchapter I (Rules and Regulations for Cargo and Miscellaneous Vessels) of this Chapter, except that all trucks shall be approved.

(c) The use of power-operated industrial trucks may be further restricted due to bulk cargo and/or vapors as set forth in Table 35.70–10(a).

§ 35.70–20 Special operating conditions—TB/ALL.

(a) Permission shall be obtained from the senior deck officer on board before placing power-operated industrial trucks in operation on a tank vessel.

(b) The senior deck officer shall ascertain by portable carbon monoxide and explosive vapor meters, if necessary, that no hazardous gas concentrations exist before granting permission to operate power trucks.

(c) When power-operated industrial trucks are in use on board vessels subject to the regulations in this subchapter, they shall be in a safe operating condition.

(d) Spaces exposed to carbon monoxide or other hazardous vapors from the exhausts of power-operated industrial trucks shall have adequate ventilation. The concentration of carbon monoxide shall be kept below 100 parts per million in the holds and intermediate decks where persons are working. When necessary, portable blowers of adequate size and location shall be utilized.

(e) The parts and/or equipment of any power-operated industrial truck requiring replacement shall be replaced only by parts and/or equipment equivalent in safety when installed with those used in the original design.

(f) Any truck that emits sparks or flames from the exhaust system shall immediately be removed from service, and not again returned to service until the cause for the emission of such sparks or flames has been eliminated.

(g) When the temperature of any part of the truck is found to be in excess of a safe operating temperature, the truck shall be removed from service until such overheating has been corrected.

(h) Operation of trucks shall be halted immediately and the engines or motors secured, whenever an emergency condition arises aboard the vessel.

(i) Operation of trucks shall be halted immediately and the engines or motors secured in the event of breakage or leakage of containers used for the carriage of flammable liquids, flammable solids or oxidizing materials.

(j) The rated capacity of a truck shall at all times be posted on the truck in a conspicuous place and such capacity shall not be exceeded.

(k) At least one approved 2-pound dry chemical hand portable fire extinguisher, or its approved equivalent, shall be affixed to the truck in a readily accessible position or kept in close proximity available for immediate use.

(l) Vessel's fire-fighting equipment, both fixed (where installed) and portable, in vicinity of space being worked shall be kept ready for immediate use.

§ 35.70–25 Refueling—TB/ALL.

(a) *When permitted.* Power-operated industrial trucks are not permitted to be refueled in the hold of a vessel or on the weather deck except under the following conditions:

(1) Trucks using gasoline as fuel may be refueled in the hold or on the weather deck of a vessel only when such refueling is done with an acceptable portable non-spilling fuel handling system of not over 5 gallons capacity. Transfer of gasoline to these portable non-spilling fuel handling devices is not permitted on board the vessel.

(2) Power-operated industrial trucks using liquefied petroleum gas as fuel may be refueled in the hold or on the

weather deck of a vessel only when fitted with removable tanks and provided the hand-operated shutoff valve of the depleted tank is closed and the engine is run until it stalls from lack of fuel before the quick disconnect fitting is opened. In addition, the quick disconnect fitting shall be attached to the fuel tank before the hand-operated shutoff valve is reopened.

(3) Power-operated industrial trucks using diesel oil as fuel may be refueled on the weather deck or in the hold of a vessel by means of portable containers of not over 5-gallon capacity. These trucks may also be refueled on the weather deck of a vessel or portable containers refilled from a larger container provided a suitable pump is used for the transfer operation and a drip pan of adequate size is supplied.

(b) *General requirements.* The following conditions must be met when refueling power-operated industrial trucks in the hold of a vessel or on the weather deck under the circumstances listed in paragraph (a) of this section:

(1) Refueling shall be under the direct supervision of an experienced and responsible person specifically designated for such job by the person in charge of the loading or unloading of the vessel.

(2) No refueling shall be undertaken with less than 2 persons specifically assigned and present for the complete operation, at least one of whom shall be experienced in using the portable fire extinguishers required in the fueling area.

(3) At least one approved 4-pound dry chemical hand portable fire extinguisher, or its approved equivalent shall be provided at the scene of the fueling area. This is in addition to the portable extinguisher affixed to the truck in accordance with § 35.70-20(k).

(4) The location for refueling trucks shall be designated by the master or senior deck officer on board the vessel. "No Smoking" signs shall be posted in the area and smoking shall be prohibited.

(5) The location designated for refueling shall be adequately ventilated so as to insure against accumulation of a hazardous concentration of vapors. The ventilation requirements of § 35.70-20 (d) when trucks are operating shall also apply when trucks are being refueled.

(6) Truck engines of all trucks in the same hold shall be stopped before any truck in that hold is refueled and before any fuel handling devices or unmounted liquefied petroleum gas cylinders are placed in the hold.

(7) All fuel handling devices and unmounted liquefied petroleum gas containers shall be removed from the hold before any truck engine is started and the trucks again placed in operation.

§ 35.70-30 Charging or replacing batteries—TB/ALL.

(a) Battery charging or battery replacement on electric powered trucks shall not be accomplished on board the vessel in locations where vapors from Grades "A," "B," "C," or "D" cargo could accumulate.

(b) Locations on board vessel for battery charging or replacement shall be designated by the master of the vessel.

(c) Battery charging on board vessel shall be accomplished in accordance with the following provisions:

(1) The batteries shall be housed in a suitable, ventilated, portable metal container with a suitable outlet at the top for connection of a portable air hose, or shall be placed directly beneath a suitable metal hood with a suitable outlet at the top for connection of a portable air hose. The air hose shall be permanently connected to an exhaust duct leading to the open deck and terminate in a gooseneck or other suitable weather head. If natural ventilation is not practicable or adequate, mechanical means of exhaust shall be employed in conjunction with the duct. The air outlet on the battery container shall be equipped with an interlock switch so arranged that the charging of the battery cannot take place unless the air hose is properly connected to the box.

(2) If mechanical ventilation is used, an additional interlock shall be provided between the fan and the charging circuit so that the fan must be in operation in order to complete the charging circuit for operation. It is preferable that this interlock switch be of a centrifugal type driven by the fan shaft.

(3) The charging facilities may be part of the truck equipment or may be separate from the truck and located inside or outside the cargo hold. The supply or charging circuit (whichever method is used) shall be connected to the truck by a portable plug connection of the break-away type. This portable plug shall be so engaged with the truck battery charging outlet that any movement of the truck away from the charging station will break the connection between the plug and receptacle without exposing any live parts to contact with a conducting surface or object, and without the plug falling to the deck where it may become subject to injury.

(d) Suitable materials handling equipment shall be employed and adequate precautions taken to avoid damaging or short circuiting batteries and to avoid spillage of electrolyte.

(e) All unmounted batteries shall be removed from the hold where trucks will be operated before such operation commences.

§ 35.70-35 Stowage of trucks aboard a vessel—TB/ALL.

(a) Power-operated industrial trucks may be stowed in any location aboard a vessel provided the following conditions are met:

(1) Gasoline powered trucks shall have all the fuel expended from the system.

(2) Liquefied petroleum gas powered trucks shall have the fuel tanks removed and all the fuel expended from the system.

(b) Power-operated industrial trucks not meeting the conditions set forth in paragraph (a) of this section shall be stowed on the open deck except for intervals such as lunch hours, between work shifts, interdock and intraport movements. If stowed in a fixed metal enclosure located on or above the weather deck, such enclosure shall have access from the weather deck only and shall have adequate ventilation, so arranged as to remove vapors from both the upper and lower portions of the space.

PART 36—ELEVATED TEMPERATURE CARGOES

Subpart 36.01—General

Sec.
36.01-1 Scope of regulations—TB/ALL.
36.01-5 Certificate of inspection—TB/ALL.

Subpart 36.05—Cargo Tanks

36.05-1 Installation of cargo tanks—TB/ALL.
36.05-10 Protection of personnel—TB/ALL.

Subpart 36.10—Piping, Valves, Fittings, and Accessory Equipment

36.10-1 Cargo pump relief valves—TB/ALL.

Subpart 36.20—Vents and Ventilation

36.20-1 Flame screens—TB/ALL.
36.20-5 Ventilation of pumproom—TB/ALL.

Subpart 36.30—Periodic Inspections

36.30-1 Lagged tanks—TB/ALL.

AUTHORITY: The provisions of this Part 36 issued under R.S. 4405, as amended, 4417a, as amended, 4462, as amended; 46 U.S.C. 375, 391a, 416. Interpret or apply R.S. 4488, as amended, sec. 3, 68 Stat. 675; 46 U.S.C. 481, 50 U.S.C. 198; E.O. 11239, July 31, 1965, 30 F.R. 9671, 3 CFR, 1965 Supp. Treasury Department Orders 120, July 31, 1950, 15 F.R. 6521; 167-14, Nov. 26, 1954, 19 F.R. 8026; 167-38, Oct. 26, 1959, 24 F.R. 8857, unless otherwise noted.

Subpart 36.01—General

§ 36.01-1 Scope of regulations—TB/ALL.

(a) The regulations in this part contain requirements for the transportation in bulk of materials considered to be Grade E liquids when shipped in molten form at elevated temperatures.

(b) The materials covered by this part shall meet the applicable regulations of this subchapter, except that materials having a flash point of 300° F. or above, shall be exempt from the requirements prescribed in the following sections of this subchapter:

(1) Inspection prior to making repairs—§ 35.01-1(b).

(2) Watchman for a tank vessel—§ 35.05-15.

(3) Warning sign at gangway—§ 35.30-1(b).

(4) Cargo tank hatches, ullage holes and Butterworth plates—§ 35.30-10.

(5) Men on duty—§ 35.35-1.

(6) Inspection prior to transfer of cargo—§ 35.35-20.

(7) Approval to start transfer of cargo—§ 35.35-25.

(8) "Declaration of inspection" for tank ships—§ 35.35-30.

(9) Transportation of other cargo or stores on tank barges—§ 35.35-60.

(c) The regulations governing the transportation in the solid state of materials referred to in § 36.01-1(a) are

contained in Part 146 of Subchapter N (Dangerous Cargoes) of this chapter.

§ 36.01–5 Certificate of inspection—TB/ALL.

(a) The certificate of inspection shall be endorsed for the carriage of elevated temperature cargoes as follows: "Inspected and approved for the carriage of Grade E combustible liquids when transported in molten form at elevated temperatures."

(R.S. 4421, as amended; 46 U.S.C. 339)

Subpart 36.05—Cargo Tanks

§ 36.05–1 Installation of cargo tanks—TB/ALL.

(a) All cargo tanks carrying liquids at elevated temperatures for the purpose of maintaining the material in the molten form shall be installed with the access openings located above the weather deck.

§ 36.05–10 Protection of personnel—TB/ALL.

(a) Decks, bulkheads, or other structure shall be insulated with an approved incombustible material, or other suitable means of protection shall be employed where practicable and necessary for the protection of personnel.

Subpart 36.10—Piping, Valves, Fittings, and Accessory Equipment

§ 36.10–1 Cargo pump relief valves—TB/ALL.

(a) Cargo pump relief valves and pressure gages may be omitted, however a suitable device shall be fitted to stop the pumping before the designed pressure of the piping is exceeded.

Subpart 36.20—Vents and Ventilation

§ 36.20–1 Flame screens—TB/ALL.

(a) Flame screens may be omitted in the vent lines on cargo tanks.

§ 36.20–5 Ventilation of pumproom—TB/ALL.

(a) Where personnel are required to enter pumprooms located below the weather deck under normal circumstances of handling cargo, such pumprooms shall be equipped with power ventilation.

Subpart 36.30—Periodic Inspections

§ 36.30–1 Lagged tanks—TB/ALL.

(a) Lagged tanks shall have part of the lagging removed on the lower portion of the cargo tanks as directed by the marine inspector, at least once every eight years for external examination.

PART 38—LIQUEFIED FLAMMABLE GASES

Subpart 38.01—General

Sec.
38.01–1 Scope of regulations—TB/ALL.
38.01–2 Transportation of portable cylinders or portable tanks containing or having previously contained liquefied flammable gases in dry cargo spaces—TB/ALL.
38.01–5 Certificate of inspection—TB/ALL.

Subpart 38.05—Design and Installation of Cargo Tanks

Sec.
38.05–1 Design and construction—TB/ALL.
38.05–5 Markings—TB/ALL.
38.05–10 Installation of cargo tanks—TB/ALL.
38.05–15 Cargo tanks on barges—B/ALL.
38.05–20 Lagging—TB/ALL.
38.05–25 Refrigerated systems—TB/ALL.

Subpart 38.10—Piping, Valves, Fittings and Accessory Equipment

38.10–1 Valves, fittings and accessories—TB/ALL.
38.10–5 Filling and discharge pipes—TB/ALL.
38.10–10 Cargo piping—TB/ALL.
38.10–15 Safety relief valves—TB/ALL.
38.10–20 Liquid level gaging devices—TB/ALL.

Subpart 38.15—Special Cargo Handling Requirements

38.15–1 Filling densities—TB/ALL.
38.15–5 Cargo hose—TB/ALL.

Subpart 38.20—Venting and Ventilation

38.20–1 Venting—T/ALL.
38.20–5 Venting—B/ALL.

Subpart 38.25—Periodic Tests and Inspections

38.25–1 Tests and inspections—TB/ALL.
38.25–5 Removal of defective tanks—TB/ALL.
38.25–10 Safety valves—TB/ALL.

AUTHORITY: The provisions of this Part 38 issued under R.S. 4405, as amended, 4417a, as amended, 4462, as amended; 46 U.S.C. 375, 391a, 416. Interpret or apply sec. 3, 68 Stat. 675; 50 U.S.C. 198; E.O. 11239, July 31, 1965, 30 F.R. 9671, 3 CFR, 1965 Supp. Treasury Department Orders 120, July 31, 1950, 15 F.R. 6521; 167–14, Nov. 26, 1954, 19 F.R. 8026, unless otherwise noted.

Subpart 38.01—General

§ 38.01–1 Scope of regulations—TB/ALL.

(a) The regulations in this part contain requirements for the transportation of liquefied flammable gases in bulk in fixed pressure-vessel types of cargo tanks vented above 10 pounds per square inch gage except as otherwise provided for in paragraphs (b), (c) and (d) of this section.

(b) When liquefied flammable gases in bulk are transported in cargo tanks vented at 10 pounds per square inch gage or below, the Commandant may permit the use of alternate methods of storage if it is shown to his satisfaction that a degree of safety is obtained consistent with the minimum requirements of this part.

(c) The regulations in this part apply specifically to the carriage of those commodities defined as liquefied flammable gases and which have no significant hazard other than flammability. Additional safeguards may be necessary for liquefied flammable gases having other significant hazardous characteristics.

(d) The transportation "on deck" of liquefied flammable gases in portable cylinders and tanks and the transportation of empty cylinders and portable tanks previously used shall be in accordance with the requirements of Part 146 of Subchapter N (Dangerous Cargoes) of this chapter. The transportation of such containers "under deck" shall be in accordance with the requirements of § 38.01–2.

§ 38.01–2 Transportation of portable cylinders or portable tanks containing or having previously contained liquefied flammable gases in dry cargo spaces—TB/ALL.

(a) ICC cylinders, ICC Specification portable tanks, or other approved portable tanks containing liquefied flammable gases may be transported under deck, provided the following requirements are met:

(1) The cargo space shall be provided with efficient means of ventilation, be protected from artificial heat, and be readily accessible from hatches.

(2) Containers shall be stored in such a position that the safety relief device is in communication with the vapor space of the container. They shall be properly stowed, dunnaged and secured to prevent movement in any direction.

(3) Unless a method acceptable to the Commandant is used, the containers shall not be over-stowed in the same dry cargo space with other liquefied flammable gas containers, nor with other cargo.

(4) The containers shall be suitably protected against physical damage from other cargo, ship's stores, or equipment in such spaces.

(5) Cylinders shall have their valves protected at all times by one of the following methods:

(i) By metal caps securely attached to the cylinders and of sufficient strength to protect valve from injury.

(ii) By having the valves recessed into the cylinders or otherwise protected so that they will not be subject to a blow if the cylinder is dropped on a flat surface.

(6) Portable tanks shall have their valves protected at all times by a housing in accordance with the requirements under which they were manufactured.

(7) Electrical circuits in such cargo spaces shall meet the requirements of § 111.60–40 in Subchapter J (Electrical Engineering) of this chapter. If the electrical circuit does not meet such requirements, it must be de-energized by a positive means and not re-energized until the cargo has been removed and the space has been tested and found free of flammable vapor.

(8) During the stowage of portable cylinders or portable tanks in a hold or compartment, that is not fitted with electrical fixtures meeting the requirements of § 111.60–40, no means of artificial lighting shall be used within the space unless such equipment is of the explosionproof type. Electrical connections for portable lights shall be made from outlets on the weather deck. Hand flashlights used in the stowage area shall be of an approved type.

(9) The following dangerous cargoes shall not be stowed in the same hold or compartment with liquefied flammable gas containers:

(i) Class A, B, or C explosives.

(ii) Flammable solids.

(iii) Oxidizing materials.
(iv) Corrosive liquids.
(v) Poisonous articles.
(vi) Cotton and similar fibrous materials.

(R.S. 4472, as amended, 4488, as amended, 46 U.S.C. 170, 481. Treasury Dept. Order 167-38, Oct. 26, 1959, 24 F.R. 8857)

§ 38.01-5 Certificate of inspection—TB/ALL.

(a) The certificate of inspection shall be endorsed for the carriage of liquefied flammable gases as follows:

Inspected and approved for the carriage of liquefied flammable gases (1) at a pressure not to exceed ------ p.s.i. (the design pressure of the container) and (2) at temperatures not less than ---° F. and not to exceed ---° F. (Tanks approved to carry cargoes at either below or above ambient temperatures shall have the applicable limiting temperatures indicated on the certificate. Tanks designed to carry cargoes only at ambient temperatures should have the word "ambient" entered in these spaces.)

(R.S. 4421, as amended; 46 U.S.C. 399)

Subpart 38.05—Design and Installation of Cargo Tanks

§ 38.05-1 Design and construction—TB/ALL.

(a) The liquefied flammable gas tanks shall meet the requirements for Class I or Class II arc welded unfired pressure vessels, and shall be fabricated, inspected, and tested in accordance with the applicable requirements of Subchapter F (Marine Engineering) of this chapter, except as otherwise provided for in this part. In the design of the tank, consideration shall be given to the possibility of the tank being subjected to external loads. Consideration shall also be given to excessive loads that can be imposed on the tanks by their support due to static and dynamic forces under operating conditions or during testing. The design shall show the manner in which the tanks are to be installed, supported, and secured, and shall be approved prior to installation.

(b) Unlagged liquefied flammable gas tanks, where the cargo is transported, at or near ambient temperatures, shall be designed for a pressure of the gas at 115° F., or for the vapor pressure of the gas at the temperature of the surrounding cargo if higher than 115° F. The design shall also be based on the minimum internal proessure (maximum vacuum), plus the maximum external static head to which the tank may be subjected. Whenever surrounding cargo is at a greater temperature than the design temperature of the liquefied flammable gas tanks, the liquefied flammable gas cargo is to be such that the design pressure of the liquefied flammable gas tank is not exceeded.

(c) Where liquefied flammable gas tanks, in which the cargo is transported at or near ambient temperature, are lagged with an insulation material of a thickness to provide a thermal conductance of not more than 0.075 B.t.u. per square foot per degree Fahrenheit differential in temperature per hour, the tanks shall be designed for a pressure of not less than the vapor pressure of the gas at 105° F. The insulation material shall conform to the requirements of § 38.05-20. The design shall also be based on the minimum internal pressure (maximum vacuum) plus the maximum external static head to which the tank may be subjected.

(d) The refrigerated cargo tank requirements are:

(1) Liquefied flammable gas tanks in which the temperature is maintained below the normal atmospheric temperature by refrigeration or other acceptable means, shall be designed for a pressure of not less than 110 percent of the vapor pressure corresponding to the temperature of the liquid at which the system is maintained or the pressure corresponding to greatest dynamic or static loads expected to be encountered in service or during testing, whichever is greater. The material of the tank shall be approved by the Commandant for the minimum operating cargo temperature and this temperature shall be permanently marked on the tank as prescribed in § 38.05-5.

(2) If the tank is vented at 10 pounds per square inch gage or below, the unfired pressure vessel requirements as specified in paragraph (a) of this section do not apply. However, the requirements of § 38.01-1(b) shall apply.

(e) The shell and head thickness of liquefied flammable gas tanks shall not be less than 5/16-inch.

(f) Each liquefied flammable gas tank shall be provided with not less than a 15-inch by 23-inch or an 18-inch diameter manhole fitted with a cover located above the maximum liquid level and as close to the top of the tank as possible. Where access trunks are fitted to the tanks, the nominal diameter of the trunks shall be not less than 30 inches.

(g) Provision shall be made for electric bonding tanks and piping.

(R.S. 4433, as amended; 46 U.S.C. 411)

§ 38.05-5 Markings—TB/ALL.

(a) Upon satisfactory completion of tests and inspection, the following marking, at least 3/8 inch high, shall be stamped into a non-corrodible nameplate permanently attached to the tank:

(Name and address of manufacturer)
---- p.s.i.
(Design pressure)
---- p.s.i.
(Shop test pressure)
---- ° F.
(Minimum allowable cargo temperature) (Applicable to refrigerated cargo only)

(Inspector's No.) (Initials and CG symbol)

(Manufacturer's Serial No.)

(Date of manufacture)

(Water capacity, U.S. gallons)

(b) All tank inlet and outlet connections, except safety relief valves, liquid level gaging devices, and pressure gages, shall be labeled to designate whether they terminate in the vapor or liquid space. Labels of corrosion-resistant material may be attached to valves.

(c) All tank markings shall be permanently and legibly stamped in a readily visible position, and shall not be obscured by painting. If the tanks are lagged, the markings attached to the tank proper shall be duplicated on a corrosion-resistant plate secured to the outside jacket of the lagging.

§ 38.05-10 Installation of cargo tanks—TB/ALL.

(a) Liquefied flammable gas tanks shall be independent of the hull and shall be so arranged as to provide a minimum clearance of not less than 24 inches from the vessel's side and not less than 15 inches from the vessel's bottom to provide access for inspection. Reduced clearances will be considered by the Commandant in special cases if adequate safeguards can be demonstrated to protect against tank damage in the event of collision or grounding. Where more than one tank is installed, the distance between such tanks and between tanks and vessel's structure shall be adequate to permit access for inspection and maintenance of all tank surfaces and hull structure as approved by the Commandant. Alternate provisions may be made for moving such tanks to provide for adequate inspection and maintenance of the vessel's structure and tanks.

(b) The conditions regarding installation are:

(1) Liquefied flammable gas tanks may be located in cargo tanks or in other spaces which meet the requirements for cofferdams as defined in § 30.10-13. When liquefied flammable gas tanks are installed in cargo tanks, such cargo tanks may be used simultaneously or separately for the carriage of flammable or combustible liquids up to and including the grade for which the cargo tanks are otherwise certified in accordance with the requirements of this subchapter.

(2) The liquefied flammable gas tanks may be installed "on deck" or "under deck" with the tanks protruding above deck.

(3) Where the liquefied flammable gas tanks are installed in dry cargo holds and a portion of the tank extends above the weather deck, provision shall be made to maintain the weathertightness of the deck. The weathertightness of the upper deck need not be maintained on:

(i) Tankships operating on restricted routes which are sufficiently protected; or,

(ii) Open hopper type barges of acceptable design.

(4) Where the liquefied flammable gas tanks are installed in cargo tanks and a portion of the liquefied flammable gas tanks extend above the weather deck, the penetration shall be made gastight and watertight, and shall be such as to provide full compliance with the structural requirements including testing for the hull and integral tanks. In the application of the requirements for the hydrostatic test of the cargo tanks, the hydrostatic test shall

in no case be less severe than the worst anticipated service condition of the cargo loading. In the design and testing of the independent cargo tanks and integral cargo tanks, consideration shall be given to the possibility of the independent tanks being subjected to external loads.

(c) All liquefied flammable gas tanks shall be installed with the manhole openings located in the open above the weather deck.

(d) Liquefied flammable gas tanks shall be supported on foundations of steel or other suitable material and securely anchored in place to preclude the liquefied flammable gas tanks from shifting when subjected to external forces. Each tank shall be so supported as to prevent the concentration of excessive loads on the supporting portions of the shell or head as prescribed under § 38.05–1(a).

(e) No strength welding employed in the attachment of supports, lugs, fittings, etc., shall be done on tanks that require and have been stress relieved, unless authorized by the Commandant.

§ 38.05–15 Cargo tanks on barges—B/ALL.

(a) Special consideration may be given by the Commandant to the design of liquefied flammable gas tanks forming all or part of the structure of a tank barge where adequate provision is made to prevent damage to tanks in the event of collision or grounding.

(b) Sides of all tank barges shall be fitted with suitable guards as an added precaution against the cargo tanks becoming damaged as a result of collision.

§ 38.05–20 Lagging—TB/ALL.

(a) Where used, the insulation material shall be of an approved type complying with the requirements of Subpart 164.009 of Subchapter Q (Specifications) of this chapter. For low temperature service the insulation shall be specifically approved by the Commandant. When the insulation is in an enclosed space where ignition is precluded by approved means, the insulation may be "self extinguishing" as tested according to ASTM D–1962–59T "Flammability of Plastics, Foam and Sheeting." (This standard may be purchased from the American Society for Testing Materials, 1916 Race Street, Philadelphia, Pa., 19103.)

(b) All insulation shall be of a vapor-proof construction, or have a vapor-proof coating of a fire-retardant material acceptable to the Commandant. Unless the vapor barrier is inherently weather resistant, tanks exposed to the weather shall be fitted with a removable sheet metal jacket of not less than 0.083 inch thick over the vapor-proof coating and flashed around all openings so as to be weathertight. Weather resistant coatings shall have sheet metal over areas subject to mechanical damage.

(R.S. 4488, as amended, 4491, as amended; U.S.C. 481, 489. Treasury Dept. Order 167–38, Oct. 26, 1959, 24 F.R. 8857)

§ 38.05–25 Refrigerated systems—TB/ALL.

(a) When a liquefied flammable gas is carried below atmospheric temperature under the requirements of § 38.05–1(d)(1) or (2), maintenance of the tank pressure below the design pressure shall be provided by one of the following means:

(1) A refrigeration or liquefaction system which regulates the pressure in the tanks. A standby compressor of a capacity equal to one of the working compressors shall be provided.

(2) A system whereby the vapors are utilized as fuel for shipboard use.

(3) A system allowing the liquefied flammable gas to warm up and increase in pressure. The insulation and tank design pressure shall be adequate to provide for a suitable margin for the operating time and temperatures involved.

(4) Other systems acceptable to the Commandant.

(b) A system whereby the vapors are vented to the atmosphere at sea only may be employed in conjunction with subparagraph (a)(1) of this section.

(c) When the tanks are insulated, the insulation shall conform to the requirements of § 38.05–20.

Subpart 38.10—Piping, Valves, Fittings and Accessory Equipment

§ 38.10–1 Valves, fittings and accessories—TB/ALL.

(a) All valves, flanges, fittings and accessory equipment for operation at atmospheric temperatures shall be of a type suitable for use with liquefied flammable gases, and shall be made of steel or Grade A malleable iron conforming to the requirements of Part 51 of Subchapter F (Marine Engineering) of this chapter: *Provided*, That where the cargo is carried at temperatures below atmospheric the valves, flanges, fittings and accessory equipment shall be of a type and material suitable for use with liquefied flammable gas at the minimum temperature to which they may be subjected, and shall be subject to approval by the Commandant. All valves, flanges, fittings and accessory equipment shall have a pressure rating at operating temperatures not less than the maximum pressure to which they may be subjected. Welded fittings shall be used wherever possible. The number of pipe joints shall be held to a minimum. Screwed joints in the cargo liquid and vapor lines are prohibited.

(b) Valve seat material, packing, gaskets, etc. shall be resistant to the action of the liquefied flammable gas. All flange and manhole cover gaskets shall be compressed asbestos, spiral-wound metal asbestos, metal jacketed asbestos, solid aluminum, corrugated steel, solid steel or iron, or other materials with equal or better resistance to fire exposure.

(c) Each tank shall be provided with the necessary fill and discharge liquid and vapor shutoff valves, safety relief valve connections, refrigeration connections where necessary, liquid level gaging devices, thermometer well and pressure gage and shall be provided with suitable access for convenient operation. Piping shall enter the cargo tanks above the weather deck except as otherwise permitted in this section. Connections to the tanks shall be protected against mechanical damage and tampering. Other openings in the tanks, except as specifically permitted by the Commandant, are prohibited. Cargo loading and discharge piping may be connected to the tanks below the weather deck, subject to approval by the Commandant, provided:

(1) A remotely controlled quick-closing shutoff valve is flanged to the tank outlet connection. The control mechanism for this valve shall meet the requirements of § 38.10–5(b).

(2) The piping which is below the weather deck shall be joined by welding, except for a flanged connection to the quick-closing shutoff valve and a flanged connection to the cargo pump.

(3) The design and arrangement of this piping, including the flange bolting, shall be such that excessive stresses will not be transmitted to the cargo tank outlet connection or the quick-closing valve, even in the event of abnormal displacement of the piping.

(4) Except for those vessels the design of which permits the exclusion of a weathertight deck over the tanks, the space in which such piping is located shall be accessible only from the weather deck and shall be vented to a safe location above the weather deck.

(d) All connections to tanks, except safety relief valves and liquid level gaging devices, except as provided in § 38.10–20(e), shall have manually operated shutoff valves located as close to the tank as possible. These valves are in addition to those required by § 38.10–5.

(e) Excess flow valves, where required by this section, shall close automatically at the rated flow of vapor or liquid as specified by the manufacturer. The piping, including valves, fittings and appurtenances protected by an excess flow valve, shall have a greater capacity than the rated flow of the excess flow valve.

(f) Liquid level gaging devices which are so constructed that outward flow of tank contents shall not exceed that passed by a No. 54 drill size opening, need not be equipped with excess flow valves.

(g) Pressure gage connections need not be equipped with excess flow valves if the openings are not larger than No. 54 drill size.

(h) Excess flow valves may be designed with a bypass not to exceed a No. 60 drill size opening to allow equalization of pressure.

(i) Suitable valves shall be installed on the cargo headers to relieve the pressure in the liquid and vapor lines to a safe location prior to disconnecting shore lines.

(j) Relief valves shall be fitted in liquid lines which may be subject to excessive pressure caused by liquid full condition and the escape from the relief valves shall be piped to a venting system or to a suitable vapor recovery system. Provision shall be made for the proper venting of all valves, fittings, etc., in which pressure buildup may occur, especially in refrigerated systems, because of an increase in product temperature.

(k) A pressure gage shall be located at the highest practicable point. A thermometer well where installed on the tank proper shall be attached to the shell by welding.

§ 38.10–5 Filling and discharge pipes—TB/ALL.

(a) Filling connection shall be provided with one of the following:

(1) A combination back pressure check valve and excess flow valve; or,

(2) One double or two single back pressure check valves; or,

(3) A positive shutoff valve in conjunction with either an internal back pressure check valve or an internal excess flow valve. This positive shutoff valve may be the one required by § 38.10–1(d).

(b) All other liquid and vapor connections to tanks, except filling connections, safety relief valves, liquid level gaging devices and pressure gages described in § 38.10–1, shall be equipped with automatic excess flow valves; or in lieu thereof, may be fitted with quick-closing shutoff valves of the fail-safe type which, except when necessary for operation of the system, shall remain closed. The control mechanism for the quick-closing shutoff valves shall be provided with a remote control in at least two locations and be of a type acceptable to the Commandant. In addition, such control mechanism shall be equipped with a fusible element designed to melt between 203° F. and 220° F., which will cause the quick-closing shutoff valve to close automatically in case of fire.

(c) The excess flow, quick-closing shutoff, or back pressure check valves shall be located on the inside of the tank or outside where the piping enters the tank. In the latter case, installation shall be made in such a manner that any undue strain will not cause breakage between the tank and excess flow, back pressure check, or internal stop valve.

(d) Where the filling and discharge connections are made through a common nozzle at the tank, and the connection is fitted with a quick-closing shutoff valve as required by paragraph (b) of this section, the back pressure check valve or excess flow valve is not required, provided however, a positive shutoff valve is installed in conjunction with the internal stop valve.

§ 38.10–10 Cargo piping—TB/ALL.

(a) The piping shall be designed for a working pressure of not less than the maximum pressure to which it may be subjected but in no case less than the design pressure of the cargo tanks. In the case of piping on the discharge side of the liquid pumps or vapor compressors, the design pressure shall not be less than the pump or compressor discharge relief valve setting; or, provided the piping is not protected by relief valves, the design pressure shall not be less than the total discharge head of the pump or compressor.

(b) Piping subject to tank pressure shall be seamless drawn steel or electric resistance welded steel. Pipe used in refrigerated tank systems shall be made of a material which is suitable for the minimum temperature to which it may be subjected and acceptable to the Commandant.

NOTE: Present U.S. Coast Guard requirements are that design temperature for materials considered to be suitable is 10° F. below the minimum operating temperature of the system.

(c) Where necessary, provision shall be made for expansion and contraction of piping by means of pipe expansion bends, packless type bellows or corrugated expansion joints. Suitable means shall be provided for controlling the expansion in the piping system. Slip type expansion joints are prohibited.

(d) Piping shall be provided with adequate support to take the weight of the piping off the valves and fittings and to prevent excessive vibration and stresses on tank connections.

§ 38.10–15 Safety relief valves—TB/ALL.

(a) Each tank shall be fitted with, or subject to approval by the Commandant connected to, one or more safety relief valves designed, constructed and flow-tested for capacity in conformance with Subpart 162.018 of Subchapter Q (Specifications) of this chapter.

(b) Each safety relief valve shall be set to start to discharge at a pressure not in excess of the design pressure of the tank.

(c) The safety relief valves shall have a combined relieving capacity sufficient to prevent a rise of pressure in the tank of more than 20 percent above the design pressure of the tank. The minimum rates of discharge of safety relief valves shall not be less than that determined by the following formula:

$$Q = 633{,}000 \frac{FA^{0.82}}{LC} \sqrt{\frac{ZT}{M}} \qquad (1)$$

or

$$Q = FGA^{0.82} \qquad (2)$$

where:

Q = Minimum required rate of discharge in cubic feet per minute of air at standard conditions (60° F. and 14.7 p.s.i.a.).

F = Fireproofing credit; $F = 1.0$, except when an approved fireproofing material of recommended thickness, or a metal screen wall is used, then $F = 0.5$. The Commandant may give special consideration to a reduction in F when considering the thermal conductance of the insulation and its stability under fire exposure.

M = Molecular weight of the cargo.

T = Temperature, degrees R (460 + temperature in degrees F. of gas at relieving conditions).

A = Total surface area of the cargo vessel in square feet which may be subjected to fire exposure.

$A = \pi \times (D \times U)$ for cylindrical tanks with hemispherical heads.

$A = \pi \times D(U + 0.3D)$, for cylindrical tanks with spherically dished or semiellipsoidal heads.

$A = \pi \times D^2$, for spherical tanks.

D = Outside diameter of the tank, in feet.

U = External overall length of the tank, in feet.

C = Constant based on the relation of the specific heats. (See A.S.M.E. "Unfired Pressure Vessel Code," section 8, page 176, which may be purchased from American Society of Mechanical Engineers, 345 East 47th Street, New York, N.Y., 10017.) (If K is not known, use $C = 315$.)

L = Latent heat of the material being vaporized at relieving conditions in B.t.u. per pound.

Z = Compressibility factor of the gas at relieving conditions (if not known, use $Z = 1.0$).

G = Constant for individual gas as shown in Table 38.10–15(c)(1).

TABLE 38.10–15(c)(1)

Relief valve setting	"G" constant for relieving conditions at 120 percent of relief valve setting
250 p.s.i.g.	53.6
90 p.s.i.g.	40.3
65 p.s.i.g.	38.6

(d) Safety relief valve connections shall be attached to the tank near the highest point of the vapor space. Shutoff valves shall not be installed between the tanks and safety relief valves, except manifolds for mounting multiple safety relief valves may be fitted with acceptable interlocking shutoff valves so arranged at all times as to permit the required capacity discharge through the open safety relief valves.

(e) Each safety relief valve shall be tested in the presence of a marine inspector before being placed in service. The tests shall satisfactorily indicate that the safety relief valves will start to discharge at a pressure not in excess of the maximum allowable pressure of the tank.

(R.S. 4491, as amended; 46 U.S.C. 489)

§ 38.10–20 Liquid level gaging devices—TB/ALL.

(a) Each tank shall be fitted with a liquid level gaging device of approved

design to indicate maximum level to which the tank may be filled with liquid at temperatures (1) between 20° F. and 130° F. for unrefrigerated service, and (2) within the operating temperature range for tanks operating below atmospheric temperature.

(b) Liquid level gaging devices may be of the following types: Rotary tube, slip tube, fixed tube, magnetic, automatic float, or similar types approved by the Commandant.

(c) All gaging devices shall be arranged so that the maximum liquid level for product being carried, to which the tank may be filled, is readily determinable. The maximum gallonage capacity as required by § 38.15–1 shall be:

(1) Marked on the tank, system nameplate, or gaging device; or,

(2) Shown in the ullage tables.

(d) Gaging devices that require bleeding of the product to the atmosphere, such as the rotary tube, fixed tube and slip tube, shall be so designed that the bleed valve maximum opening is not larger than a No. 54 drill size, unless provided with excess flow valve.

(e) Each automatic float, continuous reading tapegage, and similar type, shall be fitted with a shutoff device located as close to the tank as practicable. When an automatic float gaging device, which gages the entire height of the tank is used, a fixed tube gage set in the range of 85 percent to 90 percent of the water capacity of the tank shall be provided in addition as a means of checking the accuracy of the automatic float gage, or other alternate means acceptable to the Commandant may be used.

(f) A gaging device shall have a design pressure of at least that which is equal to the design pressure of the tank on which it is installed.

(g) For tanks operating at atmospheric temperature, the length of fixed tube device shall be designed to indicate the maximum level to which the tank may be filled, based on the volume of the product at 40° F. at its maximum permitted filling density for unlagged tanks and at 50° F. for lagged tanks. The maximum volume of the liquid at 60° F. may be obtained by determining the volume of the liquid at 40° F. or 50° F. for unlagged or lagged tanks, using the filling densities given in § 38.15–1 and correcting the liquid volumes at these temperatures to 60° F. by applying the volume correction factors in Table 38.10–20(g).

TABLE 38.10-20 (g)—VOLUME CORRECTION FACTOR

Specific gravity	Unlagged tanks	Lagged tanks
0.500	1.033	1.017
.510	1.031	1.016
.520	1.029	1.015
.530	1.028	1.014
.540	1.026	1.013
.550	1.025	1.013
.560	1.024	1.012
.570	1.023	1.011
.580	1.021	1.011
.590	1.020	1.010

(h) The method for calculating length of fixed tubes shall be:

$$\frac{\text{Water capacity of container} \times \text{Filling density}}{\text{Specific gravity} \times \text{Volume correction factor}} = \left\{\text{Maximum volume for which fixed length tube shall be set}\right.$$

(i) Gage glasses of the columnar type are prohibited.

(j) Flat sight glasses may be used in the design of automatic float continuous reading tape gages: *Provided*, That such glasses shall be made of high strength material suitable for the operating temperatures of not less than ½ inch in thickness and adequately protected by a metal cover.

Subpart 38.15—Special Cargo Handling Requirements

§ 38.15–1 Filling densities—TB/ALL.

The "filling density" is defined as the percent ratio of the weight of the gas in a tank to the weight of water the tank will hold at 60° F. The filling densities shall not exceed the ratios indicated in the Table 38.15–1.

TABLE 38.15-1—MAXIMUM PERMISSIBLE FILLING DENSITIES FOR TANKS OPERATING AT OR NEAR AMBIENT TEMPERATURE

Specific gravity at 60° F.	Maximum permitted filling density		
	Unlagged tanks—water capacity		Lagged tanks—all capacities
	1,200 gal. and under	Over 1,200 gal.	
0.473–0.480	38	41	42
0.481–0.488	39	42	43
0.489–0.495	40	43	44
0.496–0.503	41	44	45
0.504–0.510	42	45	46
0.511–0.519	43	46	47
0.520–0.527	44	47	48
0.528–0.536	45	48	49
0.537–0.544	46	49	50
0.545–0.552	47	50	51
0.553–0.560	48	51	52
0.561–0.568	49	52	53
0.569–0.576	50	53	54
0.577–0.584	51	54	55
0.585–0.592	52	55	56
0.593–0.600	53	56	57
0.601–0.608	54	57	58
0.609–0.617	55	58	59
0.618–0.626	56	59	60
0.627–0.634	57	60	61

NOTE: Increase in filling densities to provide for seasonal changes may be considered by the Commandant upon presentation of factual evidence that safe operation can be effected. The filling density for liquefied flammable gas tanks in which the temperature is maintained below the normal ambient temperature by refrigeration or other acceptable means shall be such that the tank will not be liquid full at a temperature corresponding with the vapor pressure of the start-to-discharge pressure setting of the relief valve.

§ 38.15–5 Cargo hose—TB/ALL.

(a) Flexible metal hose fabricated of seamless steel pipe and flexible joints of steel or bronze, or hose fabricated of other suitable material resistant to the action of liquefied flammable gas shall be fitted to the liquid and vapor lines during filling and discharging of the tanks. Hose used in refrigerated systems shall be suitable for the minimum temperature to which it may be subjected and shall be acceptable to the Commandant.

(b) Hose subject to tank pressure shall be designed for a bursting pressure of not less than five times the maximum safety relief valve setting of the tank.

(c) Hose subject to discharge pressure of pumps or vapor compressors shall be designed for a bursting pressure of not less than five times the pressure setting of the pump or compressor relief valve.

(d) Before being placed in service each new cargo hose, with all necessary fittings attached, shall be tested hydrostatically by the manufacturer to a pressure of not less than twice the maximum pressure to which it may be subjected. The hose shall be marked with the maximum pressure guaranteed by the manufacturer. The hose shall be marked with its maximum pressure, and with its minimum temperature when used in refrigerated service.

(R.S. 4488, as amended; 46 U.S.C. 481. Treasury Dept. Order 167–39, Oct. 26, 1959, 24 F.R. 8857)

Subpart 38.20—Venting and Ventilation

§ 38.20–1 Venting—T/ALL.

(a) Each safety relief valve installed on a cargo tank shall be connected to a branch vent of a venting system which shall be constructed so that the discharge of gas will be directed vertically upward to a point which shall extend to a height above the weather deck equal to at least one-third the beam of the vessel and to a minimum of at least 10 feet, and shall terminate at a comparable distance from any other living or working space, ventilator inlet, or source of vapor ignition. When special conditions will prevent the vent line header outlets being permanently installed at a height above the deck of one-third the beam of the vessel, then an adjustable system shall be provided which, when extended vertically, shall be capable of reaching a height of one-third the beam of the vessel.

(b) The capacity of branch vents or vent headers shall depend upon the number of cargo tanks connected to such branch or header capacity as provided for in the Table 38.20–1(b), and upon the total safety relief valve discharge capacity.

TABLE 38.20-1(b)—CAPACITY OF BRANCH VENTS OR VENT HEADERS

Number of cargo tanks:	*Percent of total valve discharge*
1 or 2	100
3	90
4	80
5	70
6 or more	60

(c) In addition to the requirements specified in paragraphs (a) and (b) of this section, the size of the branch vents or vent headers shall be such that the back pressure in the relief valve discharge lines shall not be more than 10 percent of the safety relief valve setting.

(d) Return bends and restrictive pipe fittings are not permitted.

(e) Vents and headers shall be so installed as to prevent excessive stresses on safety relief valve mountings.

(f) The vent discharge riser shall be so located as to provide protection against mechanical injury and such discharge pipes shall be fitted with loose raincaps or other suitable means to prevent entrance of rain or snow.

(g) No valve of any type shall be fitted in the vent pipe between the safety relief valve and the vent outlets.

(h) Suitable provisions shall be made for draining condensate which may accumulate in the discharge pipe. If an open drain is used, a means shall be provided to protect the tank, adjacent tanks, cargo piping, or equipment against impingement of the flame resulting from ignition of product escaping from the drain.

§ 38.20–5 Venting—B/ALL.

(a) Safety relief valves on cargo tanks in barges may be connected to individual or common risers which shall extend to a reasonable height above the deck. An alternate arrangement consisting of a branch vent header system as required by § 38.20–1 may be installed. In any case, the provisions of § 38.20–1 (d) through (h) shall apply.

(b) Arrangement specifically provided for venting cargo tanks forming a part of the hull on unmanned barges will be considered by the Commandant upon presentation of plans.

Subpart 38.25—Periodic Tests and Inspections

§ 38.25–1 Tests and inspections—TB/ALL.

(a) Each tank shall be subjected to the tests and inspections described in this section in the presence of a marine inspector, except as otherwise provided in this section.

(1) An internal examination shall be made at least once in each 8 calendar years of every tank.

(2) An external examination of unlagged tanks and the visible parts of lagged tanks shall be made at each inspection for certification and at such other times as considered necessary.

(3) Sufficient insulation shall be removed from insulated tanks at least once in each 8 calendar years to permit spot external examination of the tanks to the extent deemed necessary by the marine inspector or in lieu thereof the thickness of the tanks may be gaged by nondestructive means acceptable to the marine inspector without removal of the insulation.

(b) A hydrostatic test of 1½ times the allowable pressure as determined by the safety relief valve setting shall be made at any time that the marine inspector considers such hydrostatic test necessary to determine the condition of the tank.

(c) In the application of the requirements for the hydrostatic test of the cargo tanks, the hydrostatic test shall in no case be less severe than the worst anticipated service condition of the cargo loading.

(d) In the design and testing of the independent cargo tanks, consideration shall be given to the possibility of the independent tanks being subjected to external loads.

(R.S. 4453, as amended, 4488, as amended; 46 U.S.C. 435, 481. Treasury Dept. Order 167–38, Oct. 26, 1959, 24 F.R. 8857)

§ 38.25–5 Removal of defective tanks—TB/ALL.

If a tank fails to pass the tests prescribed in this subpart, it shall be removed from service unless otherwise authorized by the Commandant.

§ 38.25–10 Safety valves—TB/ALL.

The safety relief valve discs shall be lifted from their seats in the presence of a marine inspector by either liquid, gas or vapor pressure at least once every four years to determine the accuracy of adjustment and, if necessary, shall be reset.

PART 39—FLAMMABLE OR COMBUSTIBLE LIQUIDS HAVING LETHAL CHARACTERISTICS

Subpart 39.01—General

Sec.

39.01–1 Scope of regulations—TB/ALL.
39.01–5 Certificate of inspection—TB/ALL.

Subpart 39.05—Design, Arrangement, and Installation of Cargo Tanks

39.05–1 Design, construction, and arrangement—TB/ALL.
39.05–5 Markings—TB/ALL.
39.05–10 Installation—TB/ALL.

Subpart 39.10—Piping, Valves, Fittings, and Accessory Equipment

39.10–1 Valves and accessories—TB/ALL.
39.10–5 Piping and fittings—TB/ALL.
39.10–10 Safety relief and pressure-vacuum relief valves—TB/ALL.
39.10–15 Gaging devices—TB/ALL.

Subpart 39.15—Special Cargo Handling Requirements

39.15–1 Warning sign at gangway—TB/ALL.
39.15–5 Cargo discharge—TB/ALL.
39.15–10 Pump room controls—TB/ALL.

Subpart 39.20—Venting and Ventilation

39.20–1 Venting—TB/ALL.
39.20–5 Ventilation—TB/ALL.

Subpart 39.25—Periodic Inspections and Tests

39.25–1 Hydrostatic tests and inspection—TB/ALL.
39.25–5 Removal of defective tanks—TB/ALL.
39.25–10 Safety valves—TB/ALL.

AUTHORITY: The provisions of this Part 39 issued under R.S. 4405, as amended, 4417a, as amended, 4462, as amended; 46 U.S.C. 375, 391a, 416. Interpret or apply R.S. 4472, as amended, 4488, as amended, sec. 3, 68 Stat. 675; 46 U.S.C. 170, 481, 50 U.S.C. 198; E.O. 11239, July 31, 1965, 30 F.R. 9671, 3 CFR, 1965 Supp. Treasury Department Orders 120, July 31, 1950, 15 F.R. 6521; 167–14, Nov. 26, 1954, 19 F.R. 8026, unless otherwise noted.

Subpart 39.01—General

§ 39.01–1 Scope of regulations—TB/ALL.

(a) The regulations in this part contain requirements for the transportation of flammable or combustible liquids having lethal characteristics and defined as Class "B" or "C" poisons in §§ 146.25–10 and 146.25–15 of Part 146 of Subchapter N (Dangerous Cargoes) of this chapter. The regulations covering the transportation in portable tanks of flammable or combustible liquids having lethal characteristics and defined as Class "B" or "C" poisons are contained in Part 146 of Subchapter N (Dangerous Cargoes) of this chapter.

§ 39.01–5 Certificate of inspection—TB/ALL.

(a) Certificate of inspection shall be endorsed for the carriage of Class "B" or "C" poisonous liquids, as follows:

Inspected and approved for the carriage of flammable or combustible Class "B" or "C" poisonous liquids.

(R.S. 4421, as amended; 46 U.S.C. 399)

Subpart 39.05—Design, Arrangement, and Installation of Cargo Tanks

§ 39.05–1 Design, construction, and arrangement—TB/ALL.

(a) Cargo having a Reid vapor pressure not exceeding 14 pounds per square inch may be transported in tanks, cylindrical or rectangular, independent of the vessel's hull structure, or in tanks built integral with the vessel's hull and completely separated from the shell of the vessel by means of wing tanks, cofferdams, double bottoms or similar voids.

(b) Independent tanks shall be designed for a head of at least 8 feet above the top of the tank or the highest level the product may rise, whichever is the greater, using the specific gravity of the product to be carried. In general, plate less than 5/16 inch in thickness shall not be used in the fabrication of independent tanks unless otherwise approved by the Commandant.

(c) Tanks built integral with the vessel's hull shall conform with the scantling requirements of the American Bureau of Shipping.

(d) (1) Cargo tanks transporting liquids having a Reid vapor pressure exceeding 14 pounds per square inch, or vented at a gage pressure exceeding 4 pounds per square inch, or where air or water pressure is used to discharge the cargo, shall be fabricated as an arc-welded unfired pressure vessel and meet the applicable requirements of Parts 50 to 61, inclusive, of Subchapter F (Marine Engineering) of this chapter.

(2) Unfired pressure vessel cargo tanks shall be designed for a pressure of not less than the vapor pressure, in pounds per square inch gage, of the lading at 115° F., or the maximum air or water pressure used in discharging cargo, whichever is greater, but in no case shall the design pressure of such tanks be less than 30 pounds per square inch.

(3) The plate thickness of unfired pressure vessel type cargo tanks shall be not less than 5/16 inch. Dished heads shall be used in the design of the tanks.

(e) Each tank shall be provided with not less than a 15-inch by 18-inch or an 18-inch diameter manhole, fitted with a cover and located as close as possible

to the top of the tank. Where access trunks are fitted, the diameter or minimum dimension of the trunk shall be not less than 30 inches.

(R.S. 4433, as amended; 46 U.S.C. 411)

§ 39.05–5 Markings—TB/ALL.

(a) Upon satisfactory completion of tests and inspection, unfired pressure vessel tanks shall have markings as required by § 38.05–5(a) of this subchapter.

(b) In addition to the aforementioned markings, the following inscription shall be stamped on the tank, or a corrosion-resistant plate containing this data shall be securely attached thereto:

This tank shall not contain a product having a vapor pressure in excess of ____ p. s. i. gage at 115° F.

(c) All tank markings shall be permanently and legibly stamped in a readily visible position, and shall not be obscured by painting.

§ 39.05–10 Installation—TB/ALL.

(a) Cargo tanks independent of the hull shall be installed with a clearance of not less than 24 inches from the vessel's sides. A working space of not less than 15 inches shall be provided around and under each tank, or provision shall be made for moving the tanks to secure adequate clearance for inspection and maintenance.

(b) Independent tanks shall be mounted on substantial steel saddles securely held down and chocked. Tank saddles shall be designed so as to minimize the concentration of excessive loads at any point on the shell.

(c) Tanks may be located in hold spaces or in other cargo tanks meeting the requirements for cofferdams as prescribed in § 32.60–10 or § 32.65–15, and may be installed "on deck" or "under deck" with the tank protruding above deck. On installations where a portion of the tank extends through the weather deck, provision shall be made to maintain the watertightness of the deck. Where such tanks are installed in bulk liquid cargo tanks, the liquids in the surrounding tanks shall be inert to the toxic or poisonous liquids at temperatures of 100° F. and under, at atmospheric pressure.

(d) All tanks shall be installed with manhole openings and fittings located above the weather deck.

(e) No strength welding employed in the attachment of supports, lugs, fittings etc. shall be done on tanks that require and have been stress-relieved, unless authorized by the Commandant.

Subpart 39.10—Piping, Valves, Fittings, and Accessory Equipment

§ 39.10–1 Valves and accessories—TB/ALL.

(a) All shutoff valves and accessory equipment shall be of types suitable for use with the cargo to be carried. Gray iron castings shall not be employed in the construction of valves, fittings or flanges located outside the cargo tanks.

(b) All connections to tanks, except safety relief valves, pressure-vacuum relief valves, or gaging connections, shall have shutoff valves located as close to the tank as practicable.

§ 39.10–5 Piping and fittings—TB/ALL.

(a) Piping shall be suitable for use with the liquid cargo to be carried and shall conform to the requirements of Part 55 of Subchapter F (Marine Engineering) of this chapter. Piping shall be of seamless drawn material, except that electric resistance-welded steel piping will be acceptable.

(b) All pipe connections on pressure vessel tanks shall be grouped in the smallest practicable space and shall be located near the highest point on the tank. Alternate piping arrangements may be considered for approval by the Commandant.

(c) The pumps and cargo piping used for loading and discharging Class "B" or "C" poisons shall be independent of all other piping.

(d) Where multiple cargoes are carried, and the cargo piping conveying Class "B" or "C" poisons are led through cargo tanks containing other products the piping shall be encased in a tunnel.

(e) Where cargo lines for handling other products, or bilge and ballast piping are led through cargo tanks containing Class "B" or "C" poisons, the piping shall be encased in a tunnel.

(f) Where possible provision shall be made for expansion and contraction of piping by means of seamless steel pipe expansion bends. Corrugated expansion joints may be used, provided satisfactory evidence is shown that space limitations do not permit the use of expansion bends. Slip type expansion joints are prohibited.

§ 39.10–10 Safety relief and pressure-vacuum relief valves—TB/ALL.

(a) Each pressure vessel type cargo tank shall be fitted with one or more approved safety relief valves, set to start to discharge at a pressure of not less than 90 percent of the design pressure of the tank, but not in excess of the design pressure. Safety relief valves shall have sufficient relieving capacity to prevent a pressure rise exceeding 20 percent above the design pressure of the tank.

(b) Safety relief valves for pressure type cargo tanks shall be attached to the tank near the highest point of the vapor space.

(c) Gravity type cargo tanks shall be fitted with an approved pressure-vacuum relief valve of not less than 2½-inch size, which shall be set at a pressure of not less than 3 pounds per square inch, but not in excess of the design pressure of the tank.

(d) Pressure-vacuum relief valves for gravity type cargo tanks may be installed on the expansion trunk or in the branch vent line between the expansion trunk and the vent header.

§ 39.10–15 Gaging devices—TB/ALL.

A closed gaging system shall be provided for determining the liquid level within the tanks.

Subpart 39.15—Special Cargo Handling Requirements

§ 39.15–1 Warning sign at gangway—TB/ALL.

When transferring bulk cargo a warning sign as provided in § 35.30–1(b) of this subchapter shall be displayed to warn persons on board or in the vicinity of the tanks.

§ 39.15–5 Cargo discharge—TB/ALL.

The use of gas or liquid pressure to discharge the cargo from gravity type cargo tanks is prohibited. Gas or liquid pressure may be used to discharge the cargo from pressure vessel type cargo tanks, provided authorization is granted by the Commandant.

§ 39.15–10 Pump room controls—TB/ALL.

Cargo pumps, valves and fittings used for the transfer of Class "B" or "C" poisons and installed in pump rooms located below the weather deck shall be provided with means of operation from a position above the freeboard deck.

Subpart 39.20—Venting and Ventilation

§ 39.20–1 Venting—TB/ALL.

(a) Vent pipes shall be connected to each safety relief or pressure vacuum-relief valve. Tanks carrying Class "B" or "C" poisons shall be vented independent of tanks carrying other products. Tanks carrying the same class products may be connected to a vent header system or each tank may be vented independently.

(b) The vent riser shall extend to a height above the weather deck equal to at least one-third the beam of the vessel and shall terminate at a comparable distance from any other living or working space, ventilator inlet, or source of vapor ignition. When special conditions prevent the vent outlets from being permanently installed at a height above the deck of one-third the beam of the vessel, an adjustable system shall be provided which, when extended vertically, shall reach a height of one-third the beam of the vessel.

(c) The safety relief valve may be fitted with a bypass having the full capacity of the relief valve and equipped with a manually operated stop valve to permit equalizing pressures during filling and discharging operations.

§ 39.20–5 Ventilation—TB/ALL.

(a) Pump rooms located below the weather deck shall be fitted with power ventilation designed to assure sufficient air movement through the pump room to avoid accumulation of toxic vapors. The ventilation system shall be of the exhaust type having blower capacity sufficient to permit a change of air of at least 20 times per hour. At least two exhaust inlet ducts shall be provided and located near the floor level and at points where a concentration of toxic vapors may be expected. At least two fresh air inlet ducts shall be provided.

(b) Enclosed pump rooms located above the weather deck shall be fitted with power ventilation having an exhaust type blower of sufficient capacity to permit a change of air of at least 10 times per hour. The exhaust inlet ducts shall be located at points where a concentration of toxic vapors may be expected. At least one fresh air inlet duct shall be provided.

(c) The outlet duct exhausts shall terminate at a distance of at least six feet above the enclosed space or pump room and at least six feet from any entrance to the interior part of the vessel. The discharge end of the exhaust ducts shall be so located as to preclude the possibility of recirculating contaminated air through the pump room, or other spaces where personnel may be present.

Subpart 39.25—Periodic Inspections and Tests

§ 39.25–1 Hydrostatic tests and inspection—TB/ALL.

(a) Each pressure vessel tank shall be subjected to an internal examination biennially and to a hydrostatic test at the time of the periodic inspection on the fourth year after installation, and a like test shall be applied every fourth year thereafter.

(1) If there is evidence of corrosion or deterioration, the marine inspector may require additional internal examinations or hydrostatic tests at intermediate inspection periods.

(2) The hydrostatic test shall be equal to one and one-half times the design pressure. For lagged tanks the hydrostatic test shall be applied for a period of at least 20 minutes without pressure drop when portions of the jacket and lagging are not removed at intermediate inspection period.

(3) Lagged tanks shall have a portion of the jacket and lagging removed on the lower portion of the shell as directed by the marine inspector at least once every eight years for external examination.

(b) Gravity tanks and cargo tanks constructed integral with the vessel's hull shall be inspected as prescribed in Subpart 31.10 of Part 31 of this subchapter. Lagged gravity type tanks shall be examined as required by paragraph (a) of this section.

§ 39.25–5 Removal of defective tanks—TB/ALL.

If a pressure vessel fails to pass the tests prescribed in this subpart, or is deemed by the marine inspector to be unsuitable for continued use, it shall be removed from service unless otherwise authorized by the Commandant.

§ 39.25–10 Safety valves—TB/ALL.

(a) The safety relief valve discs shall be lifted from their seats in the presence of a marine inspector by either liquid, gas or vapor pressure at least once every four years to determine accuracy of adjustment and, if necessary, shall be reset.

(b) The setting and operation of the pressure-vacuum relief valves shall be checked in the presence of a marine inspector at the inspection for certification and at such other times as considered necessary.

PART 40—SPECIAL CONSTRUCTION, ARRANGEMENT, AND OTHER PROVISIONS FOR CARRYING CERTAIN FLAMMABLE OR COMBUSTIBLE DANGEROUS CARGOES IN BULK

Subpart 40.01—Application

Sec.

40.01–1 General—TB/ALL.
40.01–5 Effective date—TB/ALL.

Subpart 40.05—Ethylene Oxide

40.05–1 General—TB/ALL.
40.05–2 Tank vessel certification and other chargoes—TB/ALL.
40.05–5 How ethylene oxide may be carried—TB/ALL.
40.05–10 Design, construction and arrangement of cargo tanks—TB/ALL.
40.05–20 Installation of cargo tanks—TB/ALL.
40.05–30 Insulation—TB/ALL.
40.05–35 Cooling systems—TB/ALL.
40.05–40 Valves, fittings, and accessories—TB/ALL.
40.05–45 Liquid level gaging devices—TB/ALL.
40.05–50 Filling and discharge pipes—TB/ALL.
40.05–55 Cargo piping—TB/ALL.
40.05–60 Safety relief valves—TB/ALL.
40.05–65 Filling density—TB/ALL.
40.05–69 Venting—TB/ALL.
40.05–73 Ventilation—TB/ALL.
40.05–75 Cargo hose—TB/ALL.
40.05–80 Electrical bonding—TB/ALL.
40.05–83 Special cargo handling requirements—TB/ALL.
40.05–85 Information board—TB/ALL.
40.05–87 Tests and inspections—TB/ALL.

AUTHORITY: The provisions of this Part 40 issued under R.S. 4405, as amended, 4417a, as amended, 4462, as amended; 46 U.S.C. 375, 391a, 416. Interpret or apply sec. 3, 68 Stat. 675; 50 U.S.C. 198; E.O. 11239, July 31, 1965, 30 F.R. 9671, 3 CFR, 1965 Supp. Treasury Department Orders 120, July 31, 1950, 15 F.R. 6521; 167–14, Nov. 26, 1954, 19 F.R. 8026, unless otherwise noted.

Subpart 40.01—Application

§ 40.01–1 General—TB/ALL.

(a) The provisions of this part shall apply to all vessels which carry in bulk any of the dangerous cargoes specifically noted in this part.

§ 40.01–5 Effective date—TB/ALL.

(a) The provisions in this part shall be in effect on and after January 1, 1964.

Subpart 40.05—Ethylene Oxide

§ 40.05–1 General—TB/ALL.

(a) Ethylene oxide transported under the provisions of this subpart shall be acetylene free.

(b) Ethylene oxide may be carried in tank barges or tankships in accordance with the provisions of this subpart.

(c) No other product may be transported in tanks certified for ethylene oxide except that the Commandant may approve subsequent transportation of other products and return to ethylene oxide service if tanks, piping and auxiliary equipment are adequately cleaned to the satisfaction of the marine inspector.

§ 40.05–2 Tank vessel certification and other cargoes—TB/ALL.

(a) The certificate of inspection shall be endorsed as follows:

"Inspected and approved for the carriage of ethylene oxide in tank number(s) _____"

(b) Unless authorized by the Commandant, no other kind of cargo except methane, ethane, propane, butane and pentane shall be on board a tank vessel certificated for the carriage of ethylene oxide at the same time ethylene oxide in either the liquid or vapor state is present in any cargo tank. Ethylene oxide tanks shall not be installed in tanks intended for any other cargo.[1]

(R.S. 4421, as amended, 4472, as amended, 46 U.S.C. 399, 170)

§ 40.05–5 How ethylene oxide may be carried—TB/ALL.

(a) Ethylene oxide shall be carried in fixed, independent, pressure vessel type cargo tanks, designed, constructed, arranged and if necessary equipped with machinery to maintain the cargo temperature below 90° F. except as otherwise provided for in paragraph (c) of this section.

(b) Ethylene oxide shall be loaded at a temperature below 70° F.

(c) When ethylene oxide is to be transported at or near atmospheric pressure, the Commandant may permit the use of alternate methods of storage if it is shown to his satisfaction that a degree of safety is obtained consistent with the minimum requirements of this subpart.

(R.S. 4488, as amended; 46 U.S.C. 481. Treasury Dept. Order 167–38, Oct. 26, 1959, 24 F.R. 8857)

§ 40.05–10 Design, construction and arrangement of cargo tanks—TB/ALL.

(a) All cargo tanks shall be constructed of a carbon steel or stainless steel acceptable to the Commandant. Impurities of copper, magnesium and other acetylide-forming metals shall be kept to a minimum. The chemical composition of all steel used shall be submitted to the Commandant for approval prior to fabrication. Neither aluminum nor copper and other acetylide-forming metals, such as silver, mercury, magnesium, and their alloys shall be used as materials of construction for tanks or equipment used in handling ethylene oxide.

(b) Cargo shall be transported in cylindrical pressure vessel tanks, independent of the vessel's hull structure and so arranged as to provide a minimum clearance of not less than 24 inches from the vessel's side and not less than 15 inches from the vessel's bottom to provide access for inspection. When more than one tank is installed in a vessel, the distance between such tanks shall be not less than 15 inches unless otherwise approved by the Commandant.

(c) Cargo tanks shall meet the requirements of Class I arc-welded unfired

[1] Ethylene oxide may rearrange and/or polymerize violently, liberating large quantities of heat. A few of the most notable catalysts for this type of reaction are: anhydrous iron, tin and aluminum chlorides; pure iron and aluminum oxides; metallic potassium; alkali metal hydroxides; acids and organic bases. The speed of the reaction varies with the purity of the reactants, the temperature, the relative amount of each reactant, and the method of application.

pressure vessels and shall be fabricated, inspected and tested in accordance with the applicable requirements of Subchapter F (Marine Engineering) of this chapter.

(d) Cargo tanks shall be designed for the maximum pressure of vapor or gas used in discharging the cargo but in no case shall the design pressure of such tanks be less than the seventy-five (75) pounds per square inch gage. The tank shell and heads shall not be less than 5/16 inch thick. The design of tanks shall take into account the expected stresses due to internal pressure, static head and localized stress concentrations.

(e) Each tank shall be provided with not less than one 15- x 23-inch eliptical or 18-inch diameter manhole located above the maximum liquid level and as close as possible to the top of the tank. Where access trunks are fitted to the tanks, the diameter of the trunks shall be not less than 30 inches.

(R.S. 4433, as amended; 46 U.S.C. 411)

§ 40.05–20 Installation of cargo tanks—TB/ALL.

(a) Cargo tanks shall be located below deck in holds or enclosed spaces with the domes or trunks extended above the weather deck and terminating in the open. Provisions shall be made to maintain the watertightness of the deck by means of watertight seals around such domes or trunks. The holds or enclosed spaces, in which the ethylene oxide tanks are located, shall not be used for any other purpose. The weathertightness of the weatherdeck may not be required to be fully maintained on: (1) Tankships operating on restricted routes which are sufficiently protected; or, (2) Open hopper type barges of a suitable design approved for such service.

(b) All cargo tanks shall be installed with the manhole openings and all tank connections located above the weather deck in the open.

(c) Tanks shall be suitably mounted on steel supports and anchored in place and suitably electrically bonded to the hull. Each tank shall be so supported as to prevent the excessive concentration of loads on the supporting portion of the tank shell. Collision chocks shall be installed to prevent any longitudinal shifting of and damage to the cargo tanks in the event of collision. The design shall show the manner in which the tanks are to be installed, supported and secured in the barge or vessel and shall be approved prior to the installation of the tanks.

(d) No welding of any kind shall be done on cargo tanks or supporting structure unless authorized by the Commandant.

§ 40.05–30 Insulation—TB/ALL.

(a) All cargo tanks, piping, valves, fittings, etc., which may contain ethylene oxide in either the liquid or vapor phase, including the vent risers, shall be insulated. Flanges need not be covered, but if covered a small opening shall be left at the bottom of the flange cover to detect leaks. Insulation shall be of an approved incombustible material suitable for use with ethylene oxide, which does not signficantly lower the autoignition temperature and which does not react spontaneously with ethylene oxide. The insulation shall be of such thickness as to provide a thermal conductance of not more than 0.075 B.t.u. per square foot per degree fahrenheit differential in temperature per hour.

(b) Insulation shall be of an approved type complying with the requirements of Subpart 164.009 of Subchapter Q (Specifications) of this chapter. However, the Commandant may consider alternate proposals where it is demonstrated to his satisfaction that adequate protection against fire exposure will be provided. Insulation shall be of a vapor-proof construction, or shall have a vapor-proof coating of a fire-retardant material acceptable to the Commandant. All insulation, vapor barrier and adhesive material shall be of a type which does not lower the autoignition temperature of or react spontaneously with ethylene oxide. Insulation exposed to the weather shall have the vapor-proof coating covered with a removable sheet metal jacket, not less than 0.083-inch thickness, flashed around all openings so as to be weathertight. The sheet metal jacket may be omitted when the vapor barrier is inherently weather resistant. When a weather resistant vapor barrier is used, the insulation shall be protected by sheet metal in those areas subject to mechanical damage.

§ 40.05–35 Cooling systems—TB/ALL.

(a) When cooling systems are installed to maintain the temperature of the liquid below 90° F., at least two complete cooling plants, automatically regulated by temperature variations within the tanks shall be provided; each to be complete with the necessary auxiliaries for proper operation. The control system shall also be capable of being manually operated. An alarm shall be provided to indicate malfunctioning of the temperature controls. The capacity of each cooling system shall be sufficient to maintain the temperature of the liquid cargo at or below the design temperature of the system.

(b) An alternate arrangement may consist of three cooling plants, any two of which shall be sufficient to maintain the temperature of the liquid cargo at or below the design temperature of the system.

(c) Cooling systems requiring compression of ethylene oxide are prohibited.

§ 40.05–40 Valves, fittings, and accessories—TB/ALL.

(a) All valves, flanges, fittings, and accessory equipment shall be of a type suitable for use with ethylene oxide and shall be made of steel or stainless steel, or other materials acceptable to the Commandant. Impurities of copper, magnesium and other acetylide-forming metals shall be kept to a minimum. The chemical composition of all material used shall be submitted to the Commandant for approval prior to fabrication. Disks or disk faces, seats and other wearing parts of valves shall be made of stainless steel containing not less than 11 percent chromium. Mercury, silver, aluminum, magnesium, copper and their alloys shall not be used for any valves, gages, thermometers, etc. Gaskets shall be constructed of spirally wound stainless steel with "Teflon" or other suitable material. All packing and gaskets shall be constructed of materials which do not react spontaneously with or lower the autoignition temperature of ethylene oxide.

(b) The pressure rating of valves, fittings, and accessories shall be not less than the maximum pressure for which the cargo tank is designed or the shutoff head of the cargo pump, whichever is greater, but in no case less than 150 pounds per square inch, American Standards Association's standards. Welded fittings shall be used wherever possible and the number of pipe joints shall be held to a minimum. Threaded joints in the cargo liquid and vapor lines are prohibited.

(c) Each tank shall be provided with the necessary fill and discharge liquid and vapor shutoff valves, safety relief valves, liquid level gaging devices, thermometer well and pressure gage, which shall be accessible for convenient operation. All connections to tanks shall be made above the weather deck in the open to a trunk or dome and shall be protected against mechanical damage and tampering. Other openings in the tanks, except as specifically permitted by this part, are prohibited.

(d) All connections to the tanks, except safety relief valves, shall have manually operated shutoff valves located as close to the tank as possible. These valves are in addition to those required by § 40.05–50.

(e) Excess flow valves, where installed, shall close automatically at the rated flow of vapor or liquid as specified by the manufacturer. The piping, valves, fittings and appurtenances protected by the excess flow valves, shall have a greater flow capacity than the rated flow of the excess flow valve.

(f) Pressure gage connections need not be equipped with excess flow valves if the openings are not larger than No. 54 drill size.

(g) Excess flow valves may be designed with a bypass, not to exceed a No. 60 drill size opening, to allow equalization of pressure .

(h) Relief valves shall be fitted in liquid and vapor lines which may be subject to excessive pressure due to thermal expansion when the lines are liquid full. The escape from these relief valves shall be piped to the venting system.

(i) The pressure gage connection shall be located at the highest practical point in the vapor space of the tank.

(j) The thermometer well shall terminate in the liquid space and shall be attached to the shell by welding with the end of the fitting being provided with a gastight screwed plug or bolted cover.

§ 40.05–45 Liquid level gaging devices—TB/ALL.

(a) Each tank shall be fitted with a liquid level gaging device of approved

design to indicate the level to which the tank may be filled.

(b) Liquid level gaging devices may be the: Slip tube, magnetic, automatic float, or other types approved by the Commandant.

(c) Any gaging device that requires bleeding of the product to the atmosphere, such as the slip tube, shall be so designed that the bleed valve maximum opening is not larger than a No. 54 drill size, unless provided with an excess flow valve.

(d) The automatic float continuous reading tape gage, and similar types, shall be fitted with a shutoff valve located as close to the tank as practicable, which shall be designed to close automatically in the event of fracture of the external gage piping. An auxiliary gaging device shall always be used in conjunction with an automatic gaging device. This auxiliary device may be a duplication of the automatic device.

§ 40.05–50 Filling and discharge pipes—TB/ALL.

(a) Filling and discharge piping shall extend to within four inches of the bottom of the tank or sump pit if one is provided.

(b) In addition to the shutoff valve required by § 40.05–40(d), all tank connections larger than ½ inch inside pipe size, except safety relief valves and liquid level gaging devices, shall be fitted with either internal back pressure check valves or internal excess flow valves in conjunction with a quick closing stop valve operable from at least two remote locations. The quick closing stop valve shall be of the "fail safe" type acceptable to the Commandant and shall be equipped with a fusible plug designed to melt between 208° F. and 220° F., which will cause the quick closing valve to close automatically in case of fire. The quick closing valve shall be located as close to the tank as possible.

§ 40.05–55 Cargo piping—TB/ALL.

(a) Piping systems intended for ethylene oxide service shall not be used for any other product and shall be completely separate from all other systems. The piping system shall be designed so that no cross connections may be made either through accident or design.

(b) The piping system shall be designed for a working pressure of not less than the maximum pressure to which the system may be subjected, however, in no case shall the design pressure be less than 150 pounds per square inch. In the case of piping on the discharge side of the liquid pumps or vapor compressors, the design pressure shall be not less than the pump or compressor discharge relief valve setting; or, provided the piping is not fitted with relief valves, the design pressure shall not be less than the total discharge head of the pump or compressor.

(c) Piping shall be seamless drawn or electric resistance welded steel or stainless steel.

(d) Where necessary, provision shall be made for expansion and contraction of piping by means of seamless pipe expansion bends or offsets. Suitable means shall be provided for maintaining the piping in a fixed position.

(e) Piping shall be provided with adequate support to take the weight of the piping off the valves and fittings and to prevent excessive vibration.

§ 40.05–60 Safety relief valves—TB/ALL.

(a) Each tank shall be fitted with one or more approved safety relief valves designed, constructed and flow-tested for capacity in conformance with Subpart 162.018 of Subchapter Q (Specifications) of this chapter.

(R.S. 4491, as amended; 46 U.S.C. 489)

(b) Each safety relief valve shall be set to start to discharge at not less than 75 pounds per square inch gage, nor more than the design pressure of the tank.

(c) The safety relief valves shall have a combined relieving capacity sufficient to prevent a rise of pressure in the tank of more than 20 percent above the maximum allowable pressure when all the safety relief valves are discharging. The minimum rates of discharge of safety relief valves for tanks shall not be less than that determined by the following formula.

$$Q = 26.8A^{0.82} \quad (1)$$

where:

Q = Minimum required rate of discharge, in cubic feet per minute of standard air at 120 percent of the maximum set pressure of the safety relief valves. Discharge measured at 60° F. and atmospheric pressure (14.7 p.s.i.a.).

A = Total external surface area of the tank, in square feet.

$A = \pi(D \times U)$ for cylindrical tanks with hemispherical heads.

$A = \pi D(U + 0.3D)$, for cylindrical tanks with spherically dished or semi-ellipsoidal heads.

$A = \pi D^2$, for spherical tanks.

D = Outside diameter of the tank, in feet.

U = External over-all length of the tank, in feet.

(d) Safety relief valves shall be attached to the tank near the highest point of the vapor space. Shutoff valves shall not be installed between the tanks and safety relief valves except:

(1) Manifolds for mounting multiple safety relief valves may be fitted with acceptable interlocking shutoff valves so arranged that at all times the required relief valve capacity will be available to relieve internal pressure. The valving arrangement shall be such that no vapor will escape even if the "out of service" relief valve is removed.

(2) Auxiliary safety devices such as rupture discs or breaking pins, of suitable corrosion-resistant compatible material, may be installed between the tanks and the safety relief valves, subject to the approval of the Commandant.

(e) Each safety relief valve shall be tested in the presence of an inspector before being placed in service. The tests shall satisfactorily indicate that the safety relief valves will start to discharge at a pressure of not less than 75 pounds per square inch gage, nor greater than the design pressure of the tank.

§ 40.05–65 Filling density—TB/ALL.

(a) The filling density shall not exceed 83 percent. Filling density is defined as the ratio of the weight of material which may be loaded into the tank to the weight of water the tank will hold at 60° F. expressed as a percentage.

§ 40.05–69 Venting—TB/ALL.

(a) Tanks carrying ethylene oxide shall be vented through the safety relief valves independent of tanks carrying other products. Each safety relief valve installed on a cargo tank shall be connected to a venting system consisting of a branch vent from each cargo tank connected to a vent header which shall extend to a height above the weather deck to at least one-third the beam of the vessel and shall terminate at a comparable distance from any working or living space, ventilator inlet, or source of vapor ignition. When special conditions would prevent the vent line or header outlets being permanently installed at a height above the deck of one-third the beam of the vessel, then an adjustable system shall be provided which, when extended vertically, shall be capable of reaching a height one-third of the beam of the vessel. During loading and unloading operations the displaced ethylene oxide vapor shall be returned to the loading facility.

(b) The capacity of branch vents or vent headers shall depend upon the number of cargo tanks connected to such branch or header vents as provided for in Table 40.05–69(b), and upon the total safety relief valve discharge.

TABLE 40.05–69(b)—CAPACITY OF BRANCH VENTS OR VENT HEADERS

Number of cargo tanks	Percent of total valve discharge
1 or 2	100
3	90
4	80
5	70
6 or more	60

(c) In addition to the requirements specified in paragraphs (a) and (b) of this section, the size of the branch vents or vent headers shall be such that the back pressure in the relief valve discharge lines shall not be more than 10 percent of the safety relief valve setting.

(d) Return bends and restrictive pipe fittings are not permitted.

(e) Vents and headers shall be so installed as to prevent excessive stresses on safety relief valve mountings.

(f) The vent discharge riser shall be so located as to provide protection against mechanical damage and such discharge pipes shall be fitted with loose raincaps or other suitable means to prevent entrance of rain or snow. A weather hood may be installed at the vent outlet providing it is of such design as not to direct the flow of vapor below the horizontal.

(g) No shutoff valve of any type shall be fitted in the vent piping between the safety relief valve and the vent outlets.

(h) Suitable provision shall be made for draining condensate which may accumulate in the vent piping.

(i) The outlet of each vent riser will be fitted with acceptable corrosion-resistant flame screen of suitable material or a flame arrestor suitable for use with ethylene oxide.

(j) Safety relief valves on cargo tanks in barges may be connected to individual or common risers which shall extend to a height of not less than one-third the beam of the vessel but in no case less than seven feet above the deck. Alternate arrangements consisting of a branch vent header system may be installed. In any case, all other provisions of paragraphs (a) through (i) of this section apply.

§ 40.05–73 Ventilation—TB/ALL.

(a) All enclosed spaces within the hull shall be vented or ventilated in accordance with the provisions of this subchapter except as otherwise provided for in this subpart.

(b) The enclosed spaces on tankships and manned barges in which the cargo tanks are located shall be rendered inaccessible to personnel while the vessel is underway and shall be inerted by injection of a suitable inert gas or shall be well ventilated.

(c) The enclosed spaces on tankships and manned barges in which the cargo tanks are located, if an inerting system is not installed, shall be fitted with forced ventilation of such capacity to provide a complete change of air every three minutes and arranged in such a manner that any vapors lost into the space will be removed. The ventilation system shall be in operation at all times cargo is being loaded or discharged. No electrical equipment shall be fitted within the spaces or within 10 feet of the ventilation exhaust from these spaces.

(d) All ventilation machinery shall be of non-sparking construction and shall not provide a source of vapor ignition.

(e) Each vent shall be fitted with a flame screen of corrosion resistant wire which is suitable for use with ethylene oxide.

§ 40.05–75 Cargo hose—TB/ALL.

(a) Flexible metal hose fabricated of stainless steel or other acceptable material, resistant to the action of ethylene oxide, shall be fitted to the liquid and vapor lines during filling and discharging of the tanks.

(b) Hose subject to tank pressure shall be designed for a bursting pressure of not less than five times the maximum safety relief valve setting of the tank.

(c) Hose subject to discharge pressure of pumps or vapor compressors shall be designed for a bursting pressure of not less than five times the pressure setting of the pump or compressor safety relief valve.

(d) Before being placed in service, each new cargo hose, with all necessary fittings attached, shall be tested hydrostatically by the manufacturer to a pressure of not less than twice the maximum pressure to which it may be subjected in service. The hose shall be marked with the maximum pressure guaranteed by the manufacturer, and with the words "Certified For Ethylene Oxide".

(e) Cargo hose intended for ethylene oxide service shall not be used for any other products except those which are compatible with ethylene oxide.

(R.S. 4488, as amended; 46 U.S.C. 481. Treasury Dept. Order 167–38, Oct. 26, 1959, 24 F.R. 8857)

§ 40.05–80 Electrical bonding—TB/ALL.

(a) Each cargo tank shall be electrically bonded to the hull. The vessel shall be electrically bonded to the shore piping prior to connecting the cargo hose. This electrical bonding shall be maintained until after the cargo hose has been disconnected and any spillage has been removed.

§ 40.05–83 Special cargo handling requirements—TB/ALL.

(a) Cargo shall be discharged by pumping or by displacement with nitrogen or other acceptable inert gas. In no case shall air be allowed to enter the system. During loading and unloading operations the vapor shall not be discharged to the atmosphere. Provisions shall be made to return all displaced vapor to the loading facility. The loading rate and the pressure applied to the tank to discharge the cargo shall be so limited that the safety relief valves will not be caused to open.

(b) The cargo shall be shipped under a suitable protective padding, such as nitrogen gas. When nitrogen gas is used, the gas padding system shall be so designed that the vapor space above the liquid cargo will be filled and maintained with a gas mixture of not less than 45 percent nitrogen. Other gases proposed for use as padding may be given consideration by the Commandant. Original charging only of protective gas padding at the loading facility is not considered adequate. A sufficient amount of spare inerting gas as approved by the Commandant shall be provided on the vessel in order to maintain the proper concentration of the gas in the event of normal leakage or other losses.

(c) Any padding gas selected should be at least 98.0 percent pure and free of reactive materials, such as ammonia, hydrogen sulfide, sulfur compounds, and acetylene.

(d) A water spray extinguishing system shall be provided in the area where loading and unloading operations are conducted. The system shall be designed to operate automatically in case of fire. The capacity and arrangement shall be of such as to effectively blanket the area in way of the loading manifold and exposed deck piping for ethylene oxide. The rate of discharge and the arrangement of piping and nozzles shall be such as to give a uniform distribution over the entire area protected. Additionally, means shall be provided for local and remote manual operation. The arrangement shall be such that any spilled cargo will be washed away. A water hose with pressure to the nozzle, when atmospheric temperatures permit, shall be connected ready for immediate use during filling and discharge operations and any spillage of ethylene oxide shall be immediately washed away.

(e) Prior to disconnecting shore lines, the pressure in the liquid and vapor lines shall be relieved through suitable valves installed at the loading header. The liquid and vapor discharged from these lines shall not be discharged to atmosphere.

(f) Prior to loading, a sample from the cargo tank will be taken to insure that the pad gas will meet the requirements of paragraph (b) of this section and that the oxygen content of the vapor space will be not more than 2.0 percent maximum. If necessary, a sample will be taken after loading to insure the vapor space meets this requirement.

(g) The owner, master or person in charge of any vessel subject to the provisions of this part shall insure that during cargo transfer operations the persons required by Subpart 35.35 of this subchapter shall be especially qualified in the handling of ethylene oxide.

(R.S. 4488, as amended; 46 U.S.C. 481. Treasury Dept. Order 167–38, Oct. 26, 1959, 24 F.R. 8857)

§ 40.05–85 Information board—TB/ALL.

(a) A suitable information board shall be installed upon which shall be posted the information described in this section.

(b) The following information shall remain posted on board from time cargo transfer operations begin until the vessel is gas-free or changes cargo:

(1) Identification of the cargo.

(2) A description of the principal characteristics of the cargo.

(3) Instructions for the safe handling of the cargo, including operating procedures for maintaining the required cargo temperature.

(4) List and locations of all safety equipment.

(5) Emergency procedures.

(R.S. 4488, as amended; 46 U.S.C. 481. Treasury Dept. Order 167–38, Oct. 26, 1959, 24 F.R. 8857)

§ 40.05–87 Tests and inspections—TB/ALL.

(a) Each tank shall be subjected to the tests and inspections described in this paragraph in the presence of a marine inspector, except as otherwise provided in this section.

(1) An internal examination shall be made at least once in each four calendar years.

(2) Sufficient insulation shall be removed from the tank at least once in each four calendar years for spot external examination of the tank.

(3) A hydrostatic test of 1½ times the design pressure shall be made at least once in each four years at the time the internal examination is made and

at such other times as considered necessary by the marine inspector.

(4) The safety relief valves shall be tested by liquid, gas, or vapor pressure at least once every two years to determine the accuracy of adjustment and, if necessary, shall be reset. Ethylene oxide shall not be used as the testing medium.

(b) The cargo hose and piping shall be inspected and tested at least once in each two calendar years.

(1) The cargo hose and piping shall be subjected to a hydrostatic test of 1½ times the maximum pressure to which they may be subjected in service.

(2) If any leakage, seepage or distortion is noted at any time, the hose shall be removed from service and replaced and/or the piping shall be repaired.

(3) In those cases where the cargo hose used is not part of the vessel's equipment, the senior deck officer shall determine that the provisions of this paragraph have been met before using such hose. A certificate of test, supplied by the loading facility, will be considered as adequate for this determination.

(R.S. 4453, as amended, 4488, as amended; 46 U.S.C. 435, 481. Treasury Dept. Orders 120, July 31, 1950, 167-38, Oct. 26, 1959, 24 F.R. 8857)

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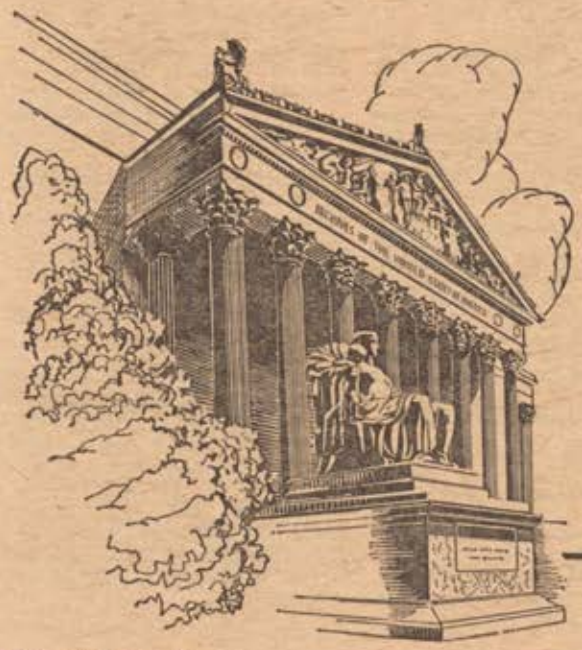
Department of the Treasury

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Coast Guard

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Shipping



THE NATIONAL ARCHIVES OF THE UNITED STATES • 1934 •

Title 46—SHIPPING

Chapter I—Coast Guard, Department of the Treasury

SUBCHAPTER E—LOAD LINES

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AUTHORITY: The provisions of this Part 43 issued under sec. 2, 45 Stat. 1493, as amended, sec. 2, 49 Stat. 888, as amended; 46 U.S.C. 85a, 88a. Treasury Department Orders 120, July 31, 1950, 15 F.R. 6521; 167-46, October 19, 1962, 27 F.R. 10504.

Subpart 43.01—Administration

§ 43.01–1 Establishment of load lines.

(a) Load lines are established for merchant vessels of 150 gross tons or over in conformity with the Act of March 2, 1929, as amended (46 U.S.C. 85–85g), the Coastwise Load Line Act, 1935, as amended (46 U.S.C. 88–88i), or the International Load Line Convention, 1930.

(b) Load lines for merchant vessels of 150 gross tons or over shall be pursuant to the regulations in this part when such vessels:

[1] See Part 44 for load line regulations applicable to coastwise load lines for steam colliers, tugs, barges, and self-propelled barges in special services and for Great Lakes vessels making foreign and coastwise voyages.

(1) Engage in foreign voyages by sea, or arrive within the jurisdiction of the United States or her possessions from foreign voyages by sea, in both cases the Great Lakes excepted; or,

(2) Engage in coastwise voyages by sea (domestic), the Great Lakes excepted.

(c) The load line regulations for merchant vessels which engage in voyages on the Great Lakes are in Part 45 of this subchapter. The load line regulations applicable to coastwise load lines for steam colliers, barges, and self-propelled barges in special services are in Part 44 of this subchapter.

(d) With respect to the enforcement of the regulations in this subchapter, the following rulings have been made:

(1) Vessels which engage in voyages from one port or place in the United States (including Alaska and Hawaii) to another port or place in the United States, or between ports or places in the same U.S. possession, and during such voyages pass outside the line dividing inland waters from the high seas are subject to the Coastwise Load Line Act.

(2) Vessels which engage in voyages from a port or place in the United States on the Atlantic Coast or Coast of the Gulf of Mexico to a port or place in the United States on the Pacific Coast (including Alaska and Hawaii), or vice versa, are subject to the Coastwise Load Line Act.

(3) Vessels which engage in voyages from one port or place in the United States to a port or place in a possession, or vice versa, or between ports or places in two different U.S. possessions, and pass outside the line dividing inland waters from the high seas are subject to the Coastwise Load Line Act, and the International Load Line Convention, 1930.

(4) Vessels which engage in voyages from a port or place in the United States or her possessions and pass outside the line dividing inland waters from the high seas and navigate on the high seas, and then return to the same port or place are subject to the Coastwise Load Line Act.

(5) Vessels which engage in foreign voyages and pass outside the line dividing inland waters from the high seas are subject to the Act of March 2, 1929, and the International Load Line Convention, 1930.

(6) Vessels which engage in voyages from a port or place in the United States to another port or place in the United States but during such voyages stop at a foreign port or place (the Canal Zone excluded) are considered to be on foreign voyages and subject to the requirements for such voyages.

(e) In concurrence with related Canadian regulations, the waters of the St. Lawrence River west of a straight line drawn from Cap de Rosiers to West Point Anticosti Island, and west of a line along 63° W. longitude from Anticosti Island to the north shore of the St. Lawrence River shall be considered as a part of the Great Lakes.

(f) This part shall not apply to merchant vessels on foreign voyages that are being towed and which are carrying neither cargo nor passengers.

§ 43.01–5 Responsibility for administration.

(a) Under the general direction and supervision of the Secretary of the Treasury, the Commandant of the United States Coast Guard is delegated the responsibility and authority for the administration of the Act of March 2, 1929, as amended (46 U.S.C. 85–85g), the International Load Line Convention, 1930, and the Coastwise Load Line Act, 1935, as amended (46 U.S.C. 88–88i).

§ 43.01–10 Application of regulations.

(a) No merchant vessel of the United States of 150 gross tons or over shall proceed to sea or arrive from the high seas (Great Lakes excepted), or operate on the high seas, and no foreign merchant vessel of 150 gross tons or over shall arrive or when within the jurisdiction of the United States shall proceed to sea (Great Lakes excepted) unless such vessel is:

(1) A foreign vessel and is exempted insofar as marking and certification of marks is concerned by section 5 of the Load Line Acts and § 43.01–97.

(2) A new vessel that:

(i) Has been surveyed in accordance with the provisions of § 43.01–50;

(ii) Complies with the provisions of this part as applicable to the type of vessel dealt with;

(iii) Has been marked in accordance with the provisions of this part; and,

(iv) Has had the marks certified as correct as provided by § 43.05–30.

(3) An existing vessel that:

(i) Has been surveyed, marked, and the marks certified, either under the provisions of this part, as applicable to the type of vessel, or under one of the sets of rules particularized in § 43.40–15;

(ii) Complies, as defined for the type of vessel, with the provisions of this part in principle and also in detail, as far as is reasonable and practicable, having regard to the efficiency of (*a*) the protection of openings, (*b*) guard rails, (*c*) freeing ports, and (*d*) means of access to crews' quarters provided by the existing arrangements, fittings, and appliances on the vessel.

(iii) Where it is neither reasonable nor practicable to comply with the provisions in this part in their entirety, the assigning authority will, in each case, report to the Commandant, U. S. Coast Guard, the specific matters in which the vessel is deficient, together with such recommendations as may seem desirable. Upon receipt of this report the Commandant shall determine such addition to the freeboard as will, in the judgment of the Commandant make the vessel as safe as if it had fully complied with this part.

CROSS REFERENCE: For definition of "a new vessel," and "an existing vessel," see § 43.01–25 (a).

§ 43.01–13 Penalties for violations of load line acts.

(a) The penalties for violation of various provisions of the load line acts or the regulations established thereunder are set forth in Title 46, U.S. Code, sections 85g and 88g. The Secretary of the Treasury by Treasury Department Order 167–48 has transferred to the Commandant of the United States Coast Guard authority to assess, collect, remit or mitigate any monetary penalty imposed under these laws.

(b) The master and/or owner of a vessel that is operated, navigated, or used in violation of the provisions of the Act of March 2, 1929, as amended (46 U.S.C. 85–85g), or the Coastwise Load Line Act, 1935, as amended (46 U.S.C. 88–88i), or the regulations in this part, will be subject to the penalties as set forth in law, and the vessel shall also be liable therefor. Depending upon the gravity of the violation, the Coast Guard may initiate any one or more of the following actions:

(1) Detain a vessel if deemed to be overloaded in violation of Title 46, U.S. Code, section 85c or 88c, in accordance with section 85f or 88f, and have the vessel surveyed by three disinterested surveyors.

(2) Assess and collect applicable monetary penalties for certain violations as provided in Title 46, U.S. Code, sections 85g and 88g.

(3) Initiate criminal prosecution for certain violations when required by Title 46, U.S. Code, section 85g or 88g.

(4) If there is a failure to pay monetary penalties assessed, initiate action of libel against the vessel involved.

(5) In addition to the foregoing actions described in this paragraph, any officer or seaman holding a valid Coast Guard license or merchant mariner's document and who may violate any provision of the Act of March 2, 1929, as amended (46 U.S.C. 85–85g), the International Load Line Convention, 1930, or the Coastwise Load Line Act, 1935, as amended (46 U.S.C. 88–88i), or the regulations in this part, may be subject to proceedings seeking the suspension or revocation of such person's license or document under the provisions of Title 46, U.S. Code, section 239, and the regulations prescribed thereunder in Part 137 of Subchapter K (Marine Investigations and Suspension and Revocation Proceedings) of this chapter.

(6) In determining offenses the provisions of Title 46, U.S. Code, sections 85g and 88g, also provide that "Each day a vessel is in violation of this act it constitutes a separate offense."

(c) The procedures governing the assessment, collection, remission and mitigation of any monetary penalty imposed under Title 46, U.S. Code, section 85g or 88g, for a violation of either load line law or the applicable regulations in this part, as well as the appeal procedures to be followed, are in Subpart 2.50 of Part 2 of Subchapter A (Procedures Applicable to the Public) of this chapter.

§ 43.01–15 Timber cargoes.

(a) A steamer (other than a tanker or a vessel assigned load lines on a tanker basis) which has been surveyed and marked as provided by §§ 43.01–10, 43.05–1—43.15–97, may on application by

the owner be surveyed and marked with timber load lines applicable only when carrying timber deck cargoes, and the steamer when carrying a deck cargo complying with the provisions of §§ 43.25–5 to 43.25–70, may be loaded to the timber load line as determined by this part applicable to the voyage if being:

(1) A new steamer, it complies with the conditions and provisions prescribed in §§ 43.25–5—43.25–70.

(2) An existing steamer (other than one defined in § 43.01–15) if it complies with the conditions and provisions of §§ 43.25–5—43.25–70, (other than § 43.25–15), but the vessel shall comply in principle, so far as is reasonable and practicable, with the conditions and provisions prescribed by § 43.25–15: *Provided*, That in assigning a timber load line to an existing steamer there shall be made such additions to the freeboard as shall be reasonable, having regard to the extent to which such steamer falls short of full compliance with the conditions and provisions prescribed in § 43.25–15.

(b) Existing vessels propelled by either sail or steam which have been specially constructed to carry complete cargoes of timber (that is, of the lumber schooner type) when carrying a complete cargo of timber will be marked with a load line. This load line will be applicable to all seasons and zones, and the assignment of and the certification of the load line will be made after consideration of the vessel's experience in similar voyages and of the condition of the vessel and her appliances. The conditions of assignment as required by §§ 43.25–5—43.25–70, are to be complied with so far as is reasonable and practicable. The Commandant, U. S. Coast Guard, shall approve the assignment of a load line for vessels of this type when such line is determined by experience.

(c) Existing steamers which have been specially constructed to carry complete cargoes of timber (that is, steam lumber schooner type) will be surveyed and marked and the marks certified in accordance with the conditions and provisions of §§ 43.01–10, 43.05–1—43.15–97, and these marks will be applicable when the steamers are engaged on voyages laden with a cargo other than a complete timber cargo.

(d) Existing sailing vessels of the lumber schooner type will be surveyed and marked and the marks certified in accordance with the conditions and provisions of §§ 43.01–10, 43.20–1—43.20–45, and these marks will be applicable when engaged on a voyage laden with cargo other than a complete timber cargo.

CROSS REFERENCE: For approval of Commandant, U. S. Coast Guard, see § 43.01–100.

§ 43.01–20 Tankers.

(a) A steamer specially constructed for the carriage of liquid cargoes in bulk, which has been surveyed as provided by § 43.01–10, shall be marked with tanker load lines and the marks certified as correct if being:

(1) A new vessel, it complies with the conditions and provisions prescribed in §§ 43.30–1—43.30–75.

(2) An existing vessel, it complies with the conditions and provisions in §§ 43.30–5, 43.30–20—43.30–35, and, also in principle so far as is reasonable and practicable with §§ 43.30–10, 43.30–15, 43.30–40, providing that in assigning a tanker load line to an existing vessel such additions to the freeboard shall be made as is reasonable, having regard to the extent to which the vessel falls short of full compliance with the conditions and provisions prescribed in §§ 43.30–10, 43.30–15, and 43.30–40.

§ 43.01–25 New and existing vessels.

(a) For the purpose of marking and certification of load lines on the international form, a "new vessel" is one whose keel was laid on or after July 1, 1932, all other vessels being regarded as existing vessels.

(b) For the purpose of marking and certification of load lines on the coastwise form, a "new vessel" is one whose keel was laid:

(1) If of 4,000 gross tons and over, on or after November 27, 1935.

(2) If less than 4,000 gross tons, on or after August 27, 1936.

(3) All other vessels being regarded as existing vessels.

§ 43.01–30 Vessels of special type.

(a) For steamers over 300 feet in length possessing constructional features similar to those of a tanker which afford extra invulnerability against the sea, a reduction in freeboard from that determined under §§ 43.15–1—43.15–97, may be granted.

(b) The amount of such reduction shall be determined by the assigning authority in relation to the freeboard assigned to tankers, having regard to the degree of compliance with the condition of assignment laid down for these vessels and the degree of subdivision provided. The freeboard assigned to such a vessel shall in no case be less than would be assigned to the vessel as a tanker.

(c) Before assignment or certification of the load lines for vessels of special type, the approval of the Commandant, U. S. Coast Guard, shall be obtained.

CROSS REFERENCE: For approval of the Commandant, U. S. Coast Guard, see § 43.01–100.

§ 43.01–32 Stability.

(a) The rules of this part necessarily assume that the nature and stowage of the cargo, ballast, etc., are such as to secure sufficient stability for the vessel.

(b) Having regard for the fact that certain vessels, such as those carrying all their cargo as deck cargo, may need to have the amount of cargo and resulting draft limited by stability considerations, the load line assignments of vessels, which are subject to the stability test requirements contained in § 31.10–30 in Subchapter D (Tank Vessels) or in Subpart 93.05 in Subchapter I (Cargo and Miscellaneous Vessels) of this chapter, shall in no case be deeper than permitted by the results of such tests.

(c) Load line assignments to vessels not subject to inspection will also be made subject to the results of a stability test if the design and service of the vessels are such as to indicate the need for a draft limitation based thereon.

(d) Load line assignments made to vessels before the results of stability tests are known shall be regarded as conditional and subject to verification by the Commandant.

§ 43.01–35 Marks to indicate load lines.

(a) Marks to indicate the maximum mean drafts to which a vessel can be lawfully submerged, in the various circumstances and seasons, shall be permanently marked on each side of the vessel in the form, manner, and location provided by this part.

§ 43.01–40 Assignment and certification; assigning authority.

(a) The American Bureau of Shipping is appointed to assign load lines and to determine whether the position of and the manner of marking each vessel has been performed in accordance with this part and the applicable provisions in the Act of March 2, 1929, as amended (46 U.S.C. 85–85g), or the Coastwise Load Line Act, 1935, as amended (46 U.S.C. 88–88i). The American Bureau of Shipping is authorized to issue a load line certificate, certifying to the correctness of the marks, under its own hand and seal. Its mailing address is American Bureau of Shipping, 45 Broad Street, New York, N.Y., 10004.

(1) As provided in section 3 of the Act of March 2, 1929, as amended (46 U.S.C. 85b), and section 3 of the Coastwise Load Line Act, 1935, as amended (46 U.S.C. 88b), the Commandant, United States Coast Guard, may, at the request of a shipowner, appoint any other recognized classification society which he may approve, as the load line assigning authority.

(2) The American Bureau of Shipping, or other approved load line assigning agency, is authorized to renew from time to time by endorsement a load line certificate.

(3) Load line certificates will not be issued until the load line marks have been verified. This certificate will be issued in duplicate, one copy being delivered to the owner or master of the vessel and one copy, together with a summary of the data used to determine the load line, will be forwarded to the Commandant, United States Coast Guard, Washington, D.C., 20226. Each new vessel, after January 1, 1948, when receiving its first load line certificate, shall be also furnished a copy of the load line survey report, which shall be retained on board the vessel for the information of inspectors and surveyors when carrying out subsequent load line surveys.

(b) As referred to in this subchapter, the term "assigning authority" or "American Bureau of Shipping" shall refer either to that society or to such other society as may have been specifically approved by the Commandant as a load line assigning authority for the vessel concerned.

(c) The scale of maximum fees payable to the assigning authority for this service is contained in § 43.40–5.

§ 43.01–50 Surveys.

(a) *Steel vessels.* (1) The vessel is to be placed in drydock to determine the condition of the hull plating, etc.

(2) The holds, 'tween decks, peaks, bilges, engine and boiler spaces, and bunkers are to be examined to determine the condition of the framing, etc.

(3) Deep tanks and other tanks which form part of the vessel are to be examined internally.

(4) Where a double bottom is fitted, the tanks are to be examined internally. Where double bottom and other tanks are used for fuel-oil bunkers, such tanks need not be cleaned out, provided the surveyors are able to determine by an external examination that their general condition is satisfactory.

(5) The decks are to be examined.

(6) The hatch covers, hatch beams, and fore-and-afters, tarpaulins, battens and wedges, the hatchway and ventilator coamings, companionways, the engine and boiler casings, the superstructures on the freeboard deck, and all means of protecting the openings in the freeboard deck and superstructures and bulkheads are to be examined.

(7) All air pipe outlets, scuppers, sanitary discharges in the vessel's sides, and air ports are to be examined.

(8) All gangways, cargo, and coaling ports or other similar openings in vessel's sides are to be examined.

(9) Guard rails, gangways, and shutters in freeing ports are to be examined.

(10) All eye plates or similar fittings for timber deck cargo lashings and sockets for uprights are to be examined.

(11) Where, owing to the age and condition of the vessel, the surveyors deem it necessary, the shell and deck plating may be required to be drilled in order to ascertain the then thickness of such plating.

(b) *Wood vessels.* (1) The vessel is to be placed on a drydock or a slip way and the keel, stem, stern frame or stern post and outside planking are to be examined. Caulking is to be tried at such places about the planking as deemed necessary by the surveyors.

(2) Careful examination must be made for faulty fastenings and such bolts or treenails must be backed out, or otherwise dealt with, as may be deemed necessary by the surveyors.

(3) Careful examination is to be made of the entire structure and if considered necessary borings are to be made to ascertain the conditions of the materials; should these disclose cause for further examination, listings are to be made where required to satisfy the surveyors as to the true condition of the vessel.

(4) The holds, 'tween decks, peaks, bilges, engine and boiler spaces, and bunkers are to be examined.

(5) The decks are to be examined and bored where necessary.

(6) The hatch covers, hatch beams, fore-and-afters, tarpaulins, battens and wedges, the hatchway and ventilator coamings, companionways, the engine and boiler casings, the superstructures on the freeboard deck, and all means of protecting the openings in the freeboard deck and superstructures and bulkheads are to be examined.

(7) All air pipe outlets, scuppers, sanitary discharges in the vessel's sides, and air ports are to be examined.

(8) All gangways, cargo, and coaling ports or other similar fittings in the vessel's sides are to be examined.

(9) Guard rails, gangways, and shutters in freeing ports are to be examined.

(10) All eye plates or similar fittings for timber deck cargo lashings and sockets for uprights are to be examined.

(c) *Correction of deficiencies.* (1) Any such parts or fittings of the vessel as are found to be in an unsatisfactory condition are to be repaired or renewed in order to place the vessel in a seaworthy condition so as to be eligible for a load line certificate.

§ 43.01–55 Annual inspection.

(a) A vessel having been marked as provided by this part, and the mark certified as correct, will be inspected at intervals of approximately 12 months in order to insure the maintenance in an effective condition of the fittings and appliances for the:

(1) Protection of openings,

(2) guard rails,

(3) freeing ports,

(4) means of access to crews' quarters, and

(5) that there have not been alterations made to the hull or superstructures which would affect the calculations determining the position of the load lines.

(b) The American Bureau of Shipping is appointed to make this inspection and to report thereon to the owners of the vessel, a copy of this report being forwarded to the Commandant, U. S. Coast Guard, Washington, D.C., 20226.

(c) The scale of fees payable to the American Bureau of Shipping for this service is contained in § 43.40–5.

§ 43.01–60 Application for assignment, renewal, and certification.

(a) Application for assignment and certification of load line marks or for renewal of load line certificates shall be made in writing to the American Bureau of Shipping by the owners of the vessel.

(b) Application for the assignment of load lines to a foreign vessel belonging either to a country ratifying the International Load Line Convention, 1930, or to a country with which the United States has reciprocal load line agreement in effect shall be made by the Government to which the vessel belongs, otherwise load lines shall not be assigned such a vessel under this part.

§ 43.01–65 Application for annual inspection.

(a) Application for annual load line inspection required by § 43.01–55 shall be made in writing to the American Bureau of Shipping by the owners of a vessel.

§ 43.01–70 Equivalents.

(a) Where in this part it is provided that a particular fitting or appliance, or type thereof, shall be fitted or carried in a vessel, or that any particular arrangement shall be adopted, there may be substituted any other fitting or appliance or type thereof, or any other arrangement: *Provided*, That such fitting, appliance or arrangement shall be considered a suitable equivalent by the assigning authority and the approval of the Commandant, U.S. Coast Guard, for such substitution shall have been issued.

CROSS REFERENCE: For approval of Commandant, U. S. Coast Guard, see § 43.01–100.

§ 43.01–75 Validity and renewal of certificates.

(a) As the assignment of load lines is conditioned upon the structural efficiency of the vessel and upon the provision of effective protection to vessel and crew, every vessel required to be marked by the Act of March 2, 1929, as amended (46 U.S.C. 85–85g), and Coastwise Load Line Act, 1935, as amended (46 U.S.C. 88–88l), with load lines shall be surveyed by the assigning authority at least once in each 5 years to determine that the load lines are then correctly placed as required by this part. If the load line mark be found correct for the vessel in the condition she is then in, the certificate shall be renewed for such time as the condition of the vessel then warrants, but in no case for a longer period than 5 years and the facts shall be attested by endorsement upon the back of the certificate in the form shown in § 43.40–10.

(b) Foreign vessels belonging to countries which have not ratified the Load Line Convention and which have not been exempted pursuant to section 5 of the Load Line Act (45 Stat. 1493; 46 U. S. C. 85d) shall have their load line certificate limited to a period of 1 year. The certificate may be validated for additional 1-year periods: *Provided*, That the condition of the vessel then warrants, and the facts are attested by endorsement upon the back of the load line certificate by a surveyor of the American Bureau of Shipping or of the classification society issuing the certificate. The certificate will become void 5 years from date of issue, or at the expiration of the fourth yearly validation, whichever occurs first.

(c) The Commandant, U. S. Coast Guard, shall be notified of every renewal indorsement and the date of its expiration.

§ 43.01–80 Forms of certificates.

(a) The form of certificate certifying to the correctness of the load line mark assigned under the regulations in this part shall be as shown in § 43.40–10, as follows:

(1) International load line certificate issued to United States vessels engaged in foreign voyages, applicable as stated:

(i) Form A1 for general use.

(ii) Form A2 for sailing vessels.

(iii) Form A3, general use combined with timber deck cargo.

(2) For foreign vessels belonging to countries that have not ratified or acceded to the International Load Line Convention, 1930:

(i) Form B for general use.

(3) Coastwise load line certificate issued to United States vessels engaged

solely in coastwise voyages (other than special services provided for by Part 44 of this subchapter).

(i) Form C1 for general use.

(ii) Form C 3 for sailing ships.

(iii) Form C3, general use combined with timber deck cargo.

(iv) Form C4 for certain vessels above 300 feet in length in United States coastwise and/or intercoastal service.

(b) The assigning authority may provide forms similar to the above, these forms to be approved by the Commandant, U. S. Coast Guard, before being issued.

CROSS REFERENCE: For forms of load line certificates, see §§ 43.40–10, 44.05–35 of this subchapter.

§ 43.01–85 Cancellation of certificate.

(a) Notwithstanding the marking of a load line and the issuance of a load line certificate, the certificate will be canceled if:

(1) The annual load line inspection required by § 43.01–55 has not been carried out or that the items described under § 43.01–55 (a) (1), (2), (3), and (4) are not maintained in an effective condition.

(2) The survey required by § 43.01–50 has not been carried out or that any defects disclosed by the survey have not been corrected.

(3) Due to any cause the conditions of assignment have not been maintained as provided by this part, or alterations have been made to hull or superstructures which affect the calculations made to determine the location of the load line.

§ 43.01–90 Zones and seasonal areas.

(a) A vessel coming under the provisions of the Act of March 2, 1929, as amended (46 U.S.C. 85–85g), or the Coastwise Load Line Act, 1935, as amended (46 U.S.C. 88–88i), shall conform to the conditions applicable to the zones and seasonal areas as described in this part.

(b) A port located on the boundary line between two zones shall be regarded as within the zone from which the vessel arrived or into which the vessel departs.

(c) No vessel to which these acts apply shall be loaded so as to submerge the load line then applicable to her voyage. When loading a vessel in a favorable zone for a voyage on which the vessel will enter a less favorable zone, such allowance must be made that the vessel, when crossing into the less favorable zone, will conform to the regulations and freeboard for the less favorable zone.

§ 43.01–95 Logbook entries.

(a) It is the master's responsibility to have entered in the vessel's "Official Logbook" if carried, otherwise in a log considered as its official logbook, the data required by section 6 of the Act of March 2, 1929, as amended (46 U.S.C. 85e), or section 6 of the Coastwise Load Line Act of 1935, as amended (46 U.S.C. 88e). These logbook entries shall be made before a vessel departs from her loading port or place and consist of:

(1) A statement of the load line marks applicable to the voyage;

(2) A statement of the position of the load line mark, port and starboard, at the time of departing from a port or place; and,

(3) The actual drafts of the vessel, forward and aft, as nearly as the same can be ascertained, at the time of departing from a port or place.

§ 43.01–97 Control.

(a) The Collector of Customs or the Coast Guard District Commander may detain a vessel for survey if there is reason to believe that the vessel is proceeding on her journey in excess of the draft allowed by the regulations in this part as indicated by the vessel's load line certificate, or otherwise. The Coast Guard District Commander may detain a vessel if it is so loaded as to be manifestly unsafe to proceed to sea.

(b) If the Collector of Customs orders a vessel detained, he shall immediately inform the Coast Guard District Commander thereof, who shall thereupon advise the Collector of Customs whether or not he deems that the vessel may proceed to sea with safety. If the Coast Guard District Commander orders a vessel detained, such officer will furnish the Collector of Customs immediate notification of such detention. The clearance shall be refused to any vessel which shall have been ordered detained, which shall be in effect until it is shown that the vessel is not in violation of the applicable law and the regulations in this part.

(c) The detention of a vessel will be by written order of either the Coast Guard District Commander or the Collector of Customs, depending on who orders the detention. The detaining officer will immediately arrange for a survey in the manner prescribed by either section 7 of the Act of March 2, 1929, as amended (46 U.S.C. 85f), or section 7 of the Coastwise Load Line Act, 1935, as amended (46 U.S.C. 88f), whichever may be applicable in a particular case. Unless the owner or agent waives in writing and stipulates to accept the Coast Guard's survey, the detaining officer shall appoint three disinterested surveyors and, where practicable, one of them shall be from the Surveying Staff of the American Bureau of Shipping. Such surveyors shall conduct a survey to ascertain whether or not the vessel is loaded in violation of the applicable provisions in the Act of March 2, 1929, as amended (46 U.S.C. 85–85g), or the Coastwise Load Line Act, 1935, as amended (46 U.S.C. 88–88i), and the regulations in this part. If the survey confirms the allegation that the vessel is in violation of either law or the regulations in this part, "the owner and agent shall bear the costs of the survey in addition to any penalty or fine imposed," as provided in these laws. Where such surveyors are appointed by the Collector of Customs, such appointment shall be with the approval of the Coast Guard District Commander.

(d) Whenever a vessel is detained, the master or owner may, within five days, appeal to the Commandant, United States Coast Guard, who may, if he desires, order a further survey, and may affirm, set aside, or modify the order of the detaining officer.

(e) Where a foreign vessel is detained, or any action is taken which would appear likely to result in legal proceedings being taken against such a vessel, the consul of the country to which the vessel belongs shall be informed as soon as possible of the circumstances of the case.

(f) Pursuant to the provisions of section 5 of the Act of March 2, 1929, as amended (46 U.S.C. 85d), and section 5 of the Coastwise Load Line Act, 1935, as amended (46 U.S.C. 88d), it is hereby certified that a vessel of a foreign country which has ratified the International Load Line Convention, 1930, shall be deemed a vessel of a foreign country as described in section 5 of these acts, and such a vessel shall be exempt from the provisions of the regulations in this part insofar as the marking of the load lines and the certificating thereof are concerned, only so long as such country similarly recognizes the load lines established by the regulations in this part, for the purpose of a voyage by sea: *Provided*, That the vessel is marked with load lines and has on board a valid load line certificate certifying to the correctness of the mark, the vessel shall not be loaded beyond the limits allowed by the certificate, the position of the load line of the vessel shall correspond with the certificate, the hull and superstructure shall not have been so materially altered as to affect the calculations on which the load line was based, and alterations have not been made so that the protection of openings, guardrails, freeing ports, and means of access to crew's quarters, have made the vessel manifestly unfit to proceed to sea without danger to human life.

§ 43.01–100 Approval of Commandant, U.S. Coast Guard.

(a) Where the active approval of the Commandant, U.S. Coast Guard is required in connection with this part, such information as will enable the Commandant, to obtain a comprehensive understanding of the question at issue shall be furnished and will remain with the Commandant, as a record.

Subpart 43.05—General Rules for Determining Maximum Load Lines of Merchant Vessels

§ 43.05–1 Definitions.

(a) *Steamer.* (1) The term "steamer" or "steamship" includes all vessels hav-

ing sufficient means for mechanical propulsion, except where provided with sufficient sail area for navigation under sails alone.

(2) A vessel fitted with mechanical means of propulsion and with sail area insufficient for navigation under sails alone may be assigned a load line under §§ 43.15–1—43.15–97.

(3) A lighter, barge, or other vessel without independent means of propulsion, when towed, is to be assigned a load line under §§ 43.15–1—43.15–97.

(b) *Sailing vessel.* The term "sailing vessel" includes all vessels provided with sufficient sail area for navigation under sails alone, whether or not fitted with mechanical means of propulsion.

(c) *Flush-deck vessel.* A flush-deck vessel is one which has no superstructure on the freeboard deck.

(d) *Superstructure.* A superstructure is a decked structure on the freeboard deck extending from side to side of the vessel. A raised quarter-deck is considered a superstructure.

(e) *Load line.* The load line is the line defining the maximum mean draft to which a vessel may be lawfully submerged. It is the lower limit of the freeboard as determined by the regulations in this part having regard to the various conditions and seasons.

(f) *Freeboard.* The freeboard assigned is the distance measured vertically downward at the side of the vessel amidships from the upper edge of the deck line to the upper edge of the load line.

(g) *Freeboard deck.* The freeboard deck is the deck from which the freeboard is measured, and is the uppermost complete deck having permanent means of closing all openings in weather portions of the deck in accordance with §§ 43.10–1—43.10–45. It is the upper deck in flush-deck vessels and vessels with detached superstructures. In vessels having discontinuous freeboard decks within superstructures which are not intact, or which are not fitted with class 1 closing appliances, the lowest line of the deck below the superstructure deck is taken as the freeboard deck.

(h) *Amidships.* Amidships is the middle of the length of the summer load waterline, as defined in § 43.15–1.

§ 43.05–5 Deck line.

(a) The deck line is a horizontal line 12 inches in length and 1 inch in breadth. It is to be marked amidships on each side of the vessel, and its upper edge is to pass through the point where the continuation outward of the upper surface of the freeboard deck intersects the outer surface of the shell. (See fig. 43.05–5(a).) Where the deck is partly sheathed amidships, the upper edge of the deck line is to pass through the point where the continuation outward of the upper surface of the actual sheathing at amidships intersects the outer surface of the shell.

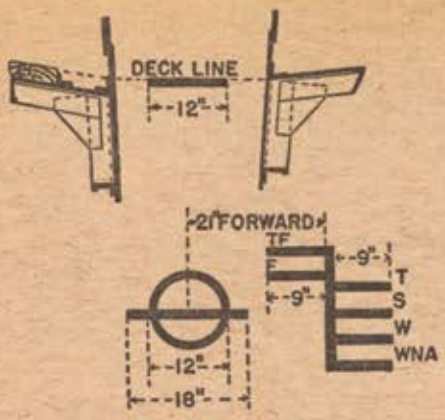


FIGURE 43.05–5(a)

§ 43.05–10 Load line disk.

(a) The load line disk is 12 inches in diameter and is intersected by a horizontal line 18 inches in length and 1 inch in breadth, the upper edge of which passes through the center of the disk. The disk is to be marked amidships below the deck line.

§ 43.05–15 Lines used with disk.

(a) The lines which indicate the maximum load line in different circumstances and in different seasons (see § 43.40–1) are to be horizontal lines, 9 inches in length and 1 inch in breadth, which extend from, and are at right angles to, a vertical line marked 21 inches forward of the center of the disk, except as provided otherwise in paragraph (d) of this section. (See Figure 43.05–5(a).)

(b) The following are the lines to be used:

(1) *Summer load line.* The summer load line is indicated by the upper edge of the line which passes through the center of the disk and also by a line marked "S."

(2) *Winter load line.* The winter load line is indicated by the upper edge of a line marked "W."

(3) *Winter North Atlantic load line.* The winter North Atlantic load line is indicated by the upper edge of a line marked "WNA."

(4) *Tropical load line.* The tropical load line is indicated by the upper edge of a line marked "T."

(5) *Fresh-water load lines.* The fresh-water load line in summer is indicated by the upper edge of a line marked "F." The difference between the fresh-water load line in summer and the summer load line is the allowance to be made for loading in fresh water at the other load lines. The tropical fresh-water load line is indicated by the upper edge of a line marked "TF."[3] (This provision for deeper loading in fresh water is not applicable to the Great Lakes.)

[3] Where seagoing steamers navigate a river or inland water, deeper loading is permitted corresponding to the weight of fuel, etc., required for consumption between the point of departure and the open sea.

(c) Where the draft is restricted on a basis of subdivision or stability and this draft is less than any of the various seasonal drafts permitted by this part the center of the disk shall be located on the line of this restricted draft and it shall be applicable to all zones and seasons. If such a permissible maximum draft comes between the seasonal markings, the seasonal markings below shall also be added. A fresh-water load line may be marked forward of the disk as provided in this section.

(d) Domestic vessels eligible for operation at the freeboards indicated by §§ 43.15–87(b), 43.15–90(b), 43.15–98(a), or 43.30–1(b) shall have the related winter, summer, tropical, fresh, and tropical fresh water marks located abaft the disk and surmounted by the letter "C". (See Figure 43.05–15(d).) While a complete set of additional marks is shown by this Figure, vessels also marked forward of the disk in accordance with § 43.05–5(a) need show abaft the disk only those additional marks which are necessary. Vessels departing on foreign voyages shall only bear the load line marks forward of the disk marked in accordance with § 43.05–5(a).

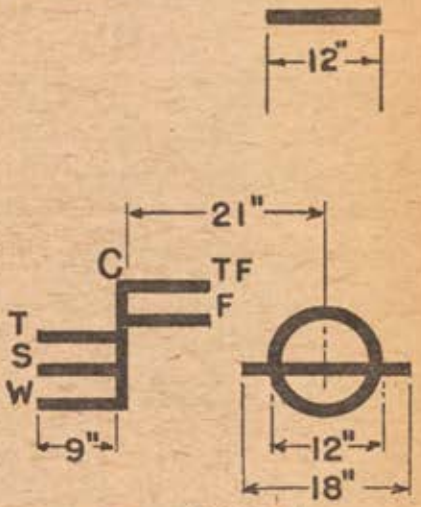


FIGURE 43.05–15(d)

§ 43.05–20 Mark of assigning authority.

(a) The authority by whom the load lines are assigned may be indicated by letters measuring about 4½ by 3 inches marked alongside the disk and above the centerline.

§ 43.05–25 Details of marking.

(a) The disk, lines, and letters are to be painted in white or yellow on a dark ground or in black on a light ground. They are also to be carefully cut in or center punched on the sides of iron and steel vessels, and on wood vessels they are to be cut into the planking for at least one-eighth of an inch. The marks are to be plainly visible, and, if necessary, special arrangements are to be made for this purpose.

§ 43.05–30 Verification of marks.

(a) The load lines certificate is not to be delivered to the vessel until a surveyor of the assigning authority has certified that the marks are correctly and permanently indicated on the vessel's side.

Subpart 43.10—Conditions of Assignment of Load Lines

§ 43.10–1 Construction of vessel.

(a) The assignment of load lines is conditional upon the vessel being structurally efficient and upon the provision of effective protection to vessel and crew.

(b) Sections 43.10–1—43.10–100 apply to vessels to which minimum freeboards are assigned. In vessels to which greater freeboards than the minimum are assigned, the protection is to be relatively as effective.

(c) Passenger vessels; subdivision and stability load lines: Where in passenger vessels the position of the maximum load lines is determined by the application of subdivision and stability regulations as provided in Part 46 of this subchapter the provisions of this part shall also be effective insofar as they are applicable.

§ 43.10–5 Cargo and other hatchways not protected by superstructures.

(a) The construction and fitting of cargo and other hatchways in exposed positions on freeboard and superstructure decks are to be at least equivalent to the standards laid down in § 43.10–10—43.10–45.

(b) Where hatch covers are of adequate metal construction, sealed watertight against pliable gaskets by dogs or other suitable means, as approved by the Load Line Assigning Authority, the application of the requirements of §§ 43.10–10—43.10–45 will be modified accordingly.

§ 43.10–10 Hatchway coamings.

(a) The height of hatchway coamings on freeboard decks is to be at least 24 inches above the deck. The height of coamings on superstructure decks is to be at least 24 inches above the deck if situated within a quarter of the ship's length from the stem, and at least 18 inches if situated elsewhere.

(b) Coamings are to be of steel, are to be substantially constructed and, where required to be 24 inches high, are to be fitted with an efficient horizontal stiffener placed not lower than 10 inches below the upper edge, and fitted with efficient brackets or stays from the stiffener to the deck, at intervals of not more than 10 feet. Where end coamings are protected, the requirements of this section may be modified.

§ 43.10–15 Hatchway covers.

(a) Covers to exposed hatchways are to be efficient, and where they are made of wood, the finished thickness is to be at least 2⅜ inches in association with a span of not more than 5 feet. The width of each bearing surface for these hatchway covers is to be at least 2½ inches.

§ 43.10–20 Hatchway beams and fore-and-afters.

(a) Where wood hatchway covers are fitted the hatchway beams and fore-and-afters are to be of the scantlings and spacing given in Table 43.10–20 (a1) where coamings 24 inches high are required, and as given in Table 43.10–20 (a2) where coamings 18 inches high are required. Angle bar mountings on the upper edge are to extend continuously for the full length of each beam. Wood fore-and-afters are to be steel shod at all bearing surfaces.

TABLE 43.10-20 (a1)—HATCHWAY BEAMS AND FORE-AND-AFTERS FOR VESSELS 200 FEET OR MORE IN LENGTH [1]

[Coamings 24 inches in height]

HATCHWAY BEAMS

Breadth of hatchway	Mounting	Beams with fore-and-afters, spacing center to center			Beams without fore-and-afters, spacing center to center	
		6′ 0″	8′ 0″	10′ 0″	4′ 0″	5′ 0″
	Inches	*Inches*	*Inches*	*Inches*	*Inches*	*Inches*
10′ 0″	3 by 3 by 0.40A	11 by 0.30P	12 by 0.32P	14 by 0.34P	9 by 0.46BP	10 by 0.50BP.
12′ 0″	3 by 3 by 0.40A	12 by 0.32P	14 by 0.34P	17 by 0.36P	11 by 0.50BP	12 by 0.50BP.
14′ 0″	3 by 3 by 0.42A	14 by 0.34P	17 by 0.36P	20 by 0.38P	12 by 0.50BP	12 by 0.32P.
16′ 0″	3½ by 3 by 0.42A	16 by 0.36P	19 by 0.38P	22 by 0.38P	12 by 0.32P	14 by 0.34P.
18′ 0″	4 by 3 by 0.44A	18 by 0.36P	21 by 0.38P	25 by 0.40P	14 by 0.34P	16 by 0.36P.
20′ 0″	4 by 3 by 0.44A	20 by 0.38P	24 by 0.40P	28 by 0.42P	15 by 0.34P	18 by 0.36P.
22′ 0″	4½ by 3 by 0.46A	22 by 0.38P	26 by 0.42P	30 by 0.44P	16 by 0.36P	19 by 0.36P.
24′ 0″	5 by 3½ by 0.46A	23 by 0.40P	28 by 0.42P	32 by 0.44P	17 by 0.36P	20 by 0.38P.
26′ 0″	5½ by 3½ by 0.48A	24 by 0.40P	29 by 0.42P	34 by 0.46P	18 by 0.36P	21 by 0.38P.
28′ 0″	6 by 3½ by 0.50A	25 by 0.40P	31 by 0.44P	36 by 0.48P	19 by 0.38P	22 by 0.38P.
30′ 0″	6 by 3½ by 0.52A	26 by 0.42P	32 by 0.44P	38 by 0.48P	20 by 0.38P	23 by 0.40P.

FORE-AND-AFTERS

Length of fore-and-afters	Mounting	Bulb plate center fore-and-afters, spacing center to center			Bulb angle side fore-and-afters, spacing center to center		
		3′ 0″	4′ 0″	5′ 0″	3′ 0″	4′ 0″	5′ 0″
	Inches	*Inches*	*Inches*	*Inches*	*Inches*	*Inches*	*Inches*
6′ 0″	2½ by 2½ by 0.36	6 by 0.36	6½ by 0.38	7 by 0.38	6 by 3 by 0.36	6½ by 3½ by 0.38	7 by 3½ by 0.38.
8′ 0″	2½ by 2½ by 0.38	7 by 0.42	8 by 0.44	9 by 0.44	7 by 3½ by 0.42	8 by 3 by 0.44	9 by 3½ by 0.44.
10′ 0″	2½ by 2½ by 0.40	8 by 0.50	9½ by 0.50	11 by 0.50	8 by 3½ by 0.50	9½ by 3½ by 0.50	11 by 3½ by 0.50.

Length of fore-and-afters	Wood center fore-and-afters, spacing center to center						Wood side fore-and-afters, spacing center to center					
	3′ 0″		4′ 0″		5′ 0″		3′ 0″		4′ 0″		5′ 0″	
	D	B	D	B	D	B	D	B	D	B	D	B
	Inches	*Inches*	*Inches*	*Inches*	*Inches*	*Inches*	*Inches*	*Inches*	*Inches*	*Inches*	*Inches*	*Inches*
6′0″	5½	7	6	7	6½	7	5½	5½	6	6	6½	6
8′0″	6½	7	7½	7	8	7	6½	6½	7½	7	8	7
10′0″	8	7	8½	8	9	9	8	7	8½	8	9	9

A = Plain angle. BP = Bulb plate. P = Plate. D = Depth. B = Breadth.

[1] In vessels not exceeding 100 feet in length, the depths of beams which are formed of plates and angles may be 60 percent of the depths given above; the depths of beams and steel fore-and-afters formed of bulb angle or bulb plate section may be 80 percent of the depths given above; the thickness of plates, bulb angles, and bulb plates should correspond to the thickness tabulated for the reduced depths with a minimum thickness of 0.30 inch; the depths and breadths of wood fore-and-afters may be 80 percent of those given in the tables for side fore-and-afters, but the center fore-and-afters must be not less than 6½ inches wide. In vessels between 100 feet and 200 feet in length, the sizes of the beams and fore-and-afters are to be determined by linear interpolation.

[2] Depths for hatchway beams are at the middle of the length and are measured from the top mounting to the lower edge. Depths for fore-and-afters are measured from the underside of the hatch covers to the lower edge. Sizes for intermediate lengths and spacing are obtained by interpolation. Where plates are specified, two angles of the size given for mountings, are to be fitted at the upper and at the lower part of the beam. Where bulb plates are specified, two angles, of the size given for mountings, are to be fitted at the upper part of the beam or fore-and-after. Where bulb angles are specified, one angle, of the size given for mountings, is to be fitted at the upper part of the section. Where the specified flanges of an angle are of different dimensions, the larger flange is to be horizontal.

TABLE 43.10-20 (a2)—HATCHWAY BEAMS AND FORE-AND-AFTERS FOR VESSELS 200 FEET OR MORE IN LENGTH [1]

[Coamings 18 inches in height]

HATCHWAY BEAMS

Breadth of hatchway	Mounting	Beams with fore-and-afters, spacing center to center			Beams without fore-and-afters, spacing center to center	
		6' 0"	8' 0"	10' 0"	4' 0"	5' 0"
	Inches	*Inches*	*Inches*	*Inches*	*Inches*	*Inches*
10'0"	3 by 3 by 0.40A	9½ by 0.46BP	10½ by 0.50BP	11½ by 0.52BP	8 by 0.40 BP	9 by 0.44BP.
12'0"	3 by 3 by 0.40A	11 by 0.50BP	11 by 0.30P	13 by 0.34P	9 by 0.44BP	10 by 0.50BP.
14'0"	3 by 3 by 0.42A	11 by 0.30P	13 by 0.32P	15 by 0.34P	10 by 0.50BP	11½ by 0.50BP.
16'0"	3½ by 3 by 0.42A	12 by 0.32P	15 by 0.34P	17 by 0.36P	11 by 0.30P	11 by 0.30P.
18'0"	4 by 3 by 0.44A	14 by 0.34P	17 by 0.36P	19 by 0.38P	11 by 0.30P	12 by 0.32P.
20'0"	4 by 3 by 0.44A	16 by 0.36P	19 by 0.38P	21 by 0.38P	12 by 0.32P	13 by 0.34P.
22'0"	4½ by 3 by 0.46A	17 by 0.36P	20 by 0.38P	23 by 0.40P	12½ by 0.32P	14 by 0.34P.
24'0"	5 by 3½ by 0.46A	18 by 0.36P	21 by 0.38P	25 by 0.40P	13 by 0.34P	14½ by 0.34P.
26'0"	5½ by 3½ by 0.48A	19 by 0.38P	22 by 0.38P	26 by 0.42P	13½ by 0.34P	15 by 0.34P.
28'0"	6 by 3½ by 0.50A	20 by 0.38P	23 by 0.40P	27 by 0.42P	14 by 0.34P	16 by 0.36P.
30'0"	6 by 3½ by 0.52A	21 by 0.38P	24 by 0.40P	28 by 0.42P	15 by 0.34P	17 by 0.36P.

FORE-AND-AFTERS

Length of fore-and-afters	Mounting	Bulb plate center fore-and-afters, spacing center to center			Bulb angle side fore-and-afters, spacing center to center		
		3' 0"	4' 0"	5' 0"	3' 0"	4' 0"	5' 0"
	Inches	*Inches*	*Inches*	*Inches*	*Inches*	*Inches*	*Inches*
6' 0"	2½ by 2½ by 0.36	5 by 0.34	5½ by 0.34	6 by 0.36	5 by 3 by 0.36	5½ by 3 by 0.34	6 by 3 by 0.36.
8' 0"	2½ by 2½ by 0.38	6 by 0.38	7 by 0.40	7½ by 0.42	6 by 3 by 0.38	7 by 3 by 0.40	7½ by 3½ by 0.42.
10' 0"	2½ by 2½ by 0.40	7 by 0.44	8 by 0.46	9 by 0.50	7 by 3 by 0.44	8 by 3½ by 0.46	9 by 3½ by 0.50.

Length of fore-and-afters	Wood center fore-and-afters, spacing center to center						Wood side fore-and-afters, spacing center to center					
	3' 0"		4' 0"		5' 0"		3' 0"		4' 0"		5' 0"	
	D	B	D	B	D	B	D	B	D	B	D	B
	Inches	*Inches*	*Inches*	*Inches*	*Inches*	*Inches*	*Inches*	*Inches*	*Inches*	*Inches*	*Inches*	*Inches*
6' 0"	5	7	5½	7	6	7	5	5	5½	5	6	5
8' 0"	6	7	6½	7	7	7	6	5	6½	6	7	6
10' 0"	7	7	7½	7	8	7	7	6	7½	7	8	7

A=Plain angle. BP=Bulb plate. P=Plate. D=Depth. B=Breadth.

[1] In vessels not exceeding 100 feet in length, the depths of beams which are formed of plates and angles may be 60 percent of the depths given above; the depths of beams and steel fore-and-afters formed of bulb angle or bulb plate section may be 80 percent of the depths given above; the thickness of plates, bulb angles, and bulb plates should correspond to the thickness tabulated for the reduced depths with a minimum thickness of 0.30 inch; the depths and breadths of wood fore-and-afters may be 80 percent of those given in the tables for side fore-and-afters, but the center fore-and-afters must be not less than 6½ inches wide. In vessels between 100 feet and 200 feet in length, the sizes of the beams and fore-and-afters are to be determined by linear interpolation.

[2] Depths for hatchway beams are at the middle of the length and are measured from the top mounting to the lower edge. Depths for fore-and-afters are measured from the under side of the hatch covers to the lower edge. Sizes for intermediate length and spacing are obtained by interpolation. Where plates are specified, two angles, of the sizes given for mountings, are to be fitted at the upper and at the lower part of the beam. Where bulb plates are specified, two angles, of the size given for mountings, are to be fitted at the upper part of the beam or fore-and-after. Where bulb angles are specified, one angle, of the size given for mountings, is to be fitted at the upper part of the section. Where the specified flanges of an angle are of different dimensions, the larger flange is to be horizontal.

§ 43.10–25 Carriers or sockets.

(a) Carriers or sockets for hatchway beams and fore-and-afters are to be of steel at least one-half inch thick, and are to have a width of bearing surface of at least 3 inches.

§ 43.10–30 Cleats.

(a) Strong cleats at least 2½ inches wide are to be fitted at intervals of not more than 2 feet from center to center; the end cleats are to be placed not more than 6 inches from each corner of the hatchway.

§ 43.10–35 Battens and wedges.

(a) Battens and wedges are to be efficient and in good condition.

§ 43.10–40 Tarpaulins.

(a) At least two tarpaulins in good condition, thoroughly waterproofed, and of ample strength, are to be provided for each hatchway in an exposed position on freeboard and superstructure decks. The material is to be guaranteed free from jute, and shall not be less than No. 4 cotton canvas or No. 6 hemp canvas before waterproofing, or shall be of suitable synthetic fabric as approved for this purpose by the Load Line Assigning Authority.

§ 43.10–45 Security of hatchway covers.

(a) At all hatchways in exposed positions on freeboard and superstructure decks ring bolts or other fittings for lashings are to be provided.

(b) Where the breadth of the hatchway exceeds 60 percent of the breadth of the deck in way of the hatchway, and the coamings are required to be 24 inches high, fittings for special lashings are to be provided for securing the hatchway covers after the tarpaulins are battened down.

§ 43.10–50 Cargo and other hatchways in the freeboard deck within superstructures which are fitted with closing appliances less efficient than class 1.

(a) The construction and fittings of such hatchways are to be at least equivalent to the standards laid down in § 43.10–55.

§ 43.10–55 Hatchway coamings and closing arrangements.

(a) Cargo, coaling, and other hatchways in the freeboard deck within superstructures which are fitted with class 2 closing appliances are to have coamings at least 9 inches in height and closing arrangements as effective as those required for exposed cargo hatchways whose coamings are 18 inches high.

(b) Where the closing appliances are less efficient than class 2, the hatchways are to have coamings at least 18 inches in height, and are to have fittings and closing arrangements as effective as those required for exposed cargo hatchways.

CROSS REFERENCE: For class 1 and class 2 closing appliances, see §§ 43.15–37, 43.15–40.

§ 43.10–60 Machinery space openings in exposed positions on freeboard and raised quarter-decks.

(a) Such openings are to be properly framed and efficiently enclosed by steel casings of ample strength, and where the casings are not protected by other structures their strength is to be specially considered. Doors in such casings are to be of steel, efficiently stiffened, permanently attached, and capable of being closed and secured from both sides. The sills of openings are to be at least 24 inches above the freeboard deck and at least 18 inches above the raised quarter-deck.

(b) Fiddley, funnel, and ventilator coamings are to be as high above the deck as is reasonable and practicable. Fiddley openings are to have strong steel covers permanently attached in their proper positions.

§ 43.10–65 Machinery space openings in exposed positions on superstructure decks other than raised quarter-decks.

(a) Such openings are to be properly framed and efficiently enclosed by strong steel casings. Doors in such cases are to be strongly constructed, permanently attached, and capable of being closed and secured from both sides. The sills

of the openings are to be at least 15 inches above superstructure decks.

(b) Fiddley, funnel, and ventilator coamings are to be as high above the deck as is reasonable and practicable. Fiddley openings are to have strong steel covers permanently attached in their proper positions.

§ 43.10–67 Machinery space openings in the freeboard deck within superstructures which are fitted with closing appliances less efficient than class 1.

(a) Such openings are to be properly framed and efficiently enclosed by steel casings. Doors in such casings are to be strongly constructed, permanently attached, and capable of being securely closed. The sills of the openings are to be at least 9 inches above the deck where the superstructures are closed by class 2 closing appliances, and at least 15 inches above the deck where the closing appliances are less efficient than class 2.

CROSS REFERENCE: For class 1 and class 2 closing appliances, see §§ 43.15–37, 43.15–40.

§ 43.10–70 Flush bunker scuttles.

(a) Flush bunker scuttles may be fitted in superstructure decks, and where so fitted are to be of iron or steel, of substantial construction, with screw or bayonet joints. Where a scuttle is not secured by hinges, a permanent chain attachment is to be provided. The position of flush bunker scuttles in small vessels in special trades is to be dealt with by each assigning authority.

§ 43.10–75 Companionways.

(a) Companionways in exposed positions on freeboard decks and on decks of enclosed superstructures are to be of substantial construction. The sills of the doorways are to be of the heights specified for hatchway coamings (see §§ 43.10–10, 43.10–55). The doors are to be strongly constructed and capable of being closed and secured from both sides. Where the companionway is situated within a quarter of the vessel's length from the stem, it is to be of steel and riveted to the deck plating.

§ 43.10–77 Ventilators in exposed positions on freeboard and superstructure decks.

(a) Such ventilators to spaces below freeboard decks or decks of superstructures which are intact or fitted with class 1 closing appliances are to have coamings of steel, substantially constructed, and efficiently connected to the deck by rivets spaced four diameters apart center to center, or by equally effective means. The deck plating at the base of the coamings is to be efficiently stiffened between the deck beams. The ventilator openings are to be provided with efficient closing arrangements.

(b) Where such ventilators are situated on the freeboard deck, or on the superstructure deck within a quarter of the vessel's length from the stem, and the closing arrangements are of a temporary character, the coamings are to be at least 36 inches in height; in other exposed positions on the superstructure deck they are to be at least 30 inches in height. Where the coaming of any ventilator exceeds 36 inches in height, it is to be specially supported and secured.

§ 43.10–80 Air pipes.

(a) Where the air pipes to ballast and other tanks extend above the freeboard or superstructure decks, the exposed parts of the pipes are to be of substantial construction; the height from the deck to the opening is to be at least 36 inches in wells on freeboard decks, 30 inches on raised quarter decks, and 18 inches on other superstructure decks. Satisfactory means are to be provided for closing the openings of the air pipes.

§ 43.10–85 Gangway, cargo, and coaling ports.

(a) Openings in the sides of vessels below the freeboard deck are to be fitted with watertight doors or covers, which, with their securing appliances, are to be of sufficient strength.

§ 43.10–87 Scuppers and sanitary discharge pipes.

(a) Discharges from scuppers and sanitary pipes led through the vessel's sides from spaces below the freeboard deck are to be fitted with efficient and accessible means for preventing water from passing inboard. Each separate discharge may have an automatic nonreturn valve with a positive means of closing it from a readily accessible position above the freeboard deck, or two automatic nonreturn valves without positive means of closing, provided the upper valve is situated so that it is always accessible for examination under service conditions. The positive-action valve is to be accessible and is to be provided with means for showing whether the valve is opened or closed.

(b) Conditional upon the type and the location of the inboard ends of such openings, similar provisions may be prescribed by the assigning authority as to discharge from spaces within enclosed superstructures.

(c) Where scuppers are fitted in superstructures not fitted with class 1 closing appliances they are to have efficient means for preventing the accidental admission of water below the freeboard deck.

§ 43.10–90 Air ports.

(a) Air ports to spaces below the freeboard deck or to spaces below the superstructure deck of superstructures closed by class 1 or class 2 closing appliances are to be fitted with efficient inside deadlights permanently attached in their proper positions so that they can be effectively closed and secured watertight.

(b) Where, however, such spaces in superstructures are appropriated to passengers other than steerage passengers or to crew, the air ports may have portable deadlights stowed adjacent to the air ports, provided they are readily accessible at all times on service.

(c) The air ports and deadlights are to be of substantial and approved construction.

CROSS REFERENCE: For class 1 and class 2 closing appliances, see §§ 43.15–37, 43.15–40.

§ 43.10–95 Guardrails.

(a) Efficient guardrails or bulwarks are to be fitted on all exposed portions of freeboard and superstructure decks.

§ 43.10–97 Freeing ports.

(a) Where bulwarks on the weather portions of freeboard or superstructure decks form "wells" ample provision is to be made for rapidly freeing the decks of water and for draining them. The minimum freeing port area on each side of the vessel for each well on the freeboard deck and on the raised quarter-deck is to be that given by the following scale: The minimum area for each well on any other superstructure deck is to be one-half the area given by the scale. Where the length of the well exceeds 0.7 *L*, the scale may be modified.

SCALE OF FREEING PORT AREA

Length of bulwarks in "well" in feet:	*Freeing port area on each side in square feet*
15	8.0
20	8.5
25	9.0
30	9.5
35	10.0
40	10.5
45	11.0
50	11.5
55	12.0
60	12.5
65	13.0
Above 65	(1)

[1] One square foot for each additional 5 feet length of bulwark.

(b) The lower edges of the freeing ports are to be as near the deck as practicable and preferably not higher than the upper edge of the gunwale bar. Two-thirds of the freeing port area required is to be provided in the midship half of the well. In vessels with less than the standard sheer the freeing port area is to be suitably increased.

(c) All such openings in the bulwarks are to be protected by rails or bars spaced about 9 inches apart. If shutters are fitted to freeing ports, ample clearance is to be provided to prevent jamming. Hinges are to have brass pins.

§ 43.10–100 Protection of crew.

(a) Gangways, lifelines, or other satisfactory means are to be provided for the protection of the crew in getting to and from their quarters. The strength of houses for the accommodation of crew on flush deck steamers is to be equivalent to that required for superstructure bulkheads.

Subpart 43.15—Load Lines for Steamers [3]

§ 43.15–1 Length (L).

(a) The length used with the rules and freeboard tables is the length in feet on the summer load water line from the foreside of the stem to the afterside of the rudder post. Where there is no rudder post, the length is measured from the foreside of the stem to the axis of the rudder stock. For vessels with cruiser sterns, the length is to be taken as 96 percent of the total length on the designed summer load waterline or as the length from the foreside of the stem to the axis of the rudder stock if that be the greater.

§ 43.15–5 Breadth (B).

(a) The breadth is the maximum breadth in feet amidships to the molded line of the frame in iron or steel vessels and to the outside of the planking in wood or composite vessels.

§ 43.15–7 Molded depth.

(a) The molded depth is the vertical distance in feet, measured amidships, from the top of the keel to the top of the freeboard deck beam at side. In wood and composite vessels the distance is measured from the lower edge of the keel rabbet. Where the form at the lower part of the midship section is of a hollow character, or where thick garboards are fitted, the depth is measured from the point where the line of the flat of the bottom continued inwards cuts the side of the keel.

§ 43.15–10 Depth for freeboard (D).

(a) The depth used with the freeboard table is the molded depth plus the thickness of stringer plate, or plus

$$\frac{T\ (L-S)}{L} \qquad (1)$$

if that be greater, where

T is the mean thickness of the exposed deck clear of deck openings, and

S is the total length of superstructures as defined in § 43.15–27.

(b) Where the topsides are of unusual form, D is the depth of a midship section having vertical topsides, standard round of beam, and area of topside section equal to that in the actual midship section. Where there is a step or break in the topsides (that is, as in the turret-deck vessel) 70 percent of the area above the step or break is included in the area used to determine the equivalent section.

(c) In a vessel without an enclosed superstructure covering at least 0.6L amidships, without a complete trunk or without a combination of intact partial superstructures and trunk extending all fore-and-aft, where D is less than $\frac{L}{15}$, the depth used with the table is not to be taken as less than $\frac{L}{15}$.

§ 43.15–15 Coefficient of fineness (c).

(a) The coefficient of fineness used with the freeboard table is given by

$$c=\frac{35\Delta}{L.B.d_1} \qquad (1)$$

where Δ is the vessel's molded displacement in tons (excluding bossing) at a mean molded draft d_1 which is 85 percent of the molded depth.

(b) The coefficient c is not to be taken as less than 0.68.

§ 43.15–17 Strength.

(a) The assigning authority is to be satisfied with the structural strength of vessels to which freeboards are assigned.

(b) Vessels which comply with the highest standard of the rules of a classification society recognized by the Commandant, U. S. Coast Guard, shall be regarded as having sufficient strength for the minimum freeboards allowed under the regulations in this part.

(c) Vessels which do not comply with the highest standard of the rules of a classification society recognized by the Commandant, U. S. Coast Guard, shall be assigned such increased freeboards as shall be determined by the assigning authority, and for guidance the following strength moduli are formulated:

(1) *Material.* The strength moduli are based on the assumption that the structure is built of mild steel, manufactured by the open-hearth process (acid or basic), and having a tensile strength of 26 to 32 tons per square inch, and an elongation of at least 16 percent, on a length of 8 inches.

(2) *Strength deck.* The strength deck is the uppermost deck which is incorporated into and forms an integral part of the longitudinal girder within the half-length amidships.

(3) *Depth to strength deck (Ds).* The depth to strength deck is the vertical distance in feet amidships from the top of the keel to the top of the strength deck beam at side.

(4) *Draft (d).* The draft is the vertical distance in feet amidships from the top of the keel to the center of the disk.

(5) *Longitudinal modulus.* The longitudinal modulus $\frac{I}{y}$ is the moment of inertia I of the midship section about the neutral axis divided by the distance y measured from the neutral axis to the top of the strength deck beam at side, calculated in way of openings but without deductions for rivet holes. Areas are measured in square inches and distances in feet.

(i) Below the strength deck, all continuous longitudinal members other than such parts of underdeck girders as are required entirely for supporting purposes are included. Above the strength deck, the gunwale angle bar and the extension of the sheerstrake are the only members included.

(ii) The required longitudinal modulus for effective material is expressed by $f.\ d.\ B.$, where f is the factor obtained from Table 43.15–17(c) (5) (ii).

TABLE 43.15–17 (c) (5) (ii)

L	f	L	f	L	f
100	1.80	280	6.20	460	14.15
120	2.00	300	6.95	480	15.15
140	2.35	320	7.70	500	16.25
160	2.70	340	8.55	520	17.35
180	3.15	360	9.40	540	18.45
200	3.60	380	10.30	560	19.60
220	4.20	400	11.20	580	20.80
240	4.80	420	12.15	600	22.00
260	5.45	440	13.10		

(iii) For intermediate lengths, the value of f is determined by interpolation. This formula applies where L does not exceed 600 feet; B is between

$$\frac{L}{10}+5 \text{ and } \frac{L}{10}+20 \qquad (1)$$

both inclusive, and $\frac{L}{D_s}$ is between 10 and 13.5, both inclusive.

(6) *Frame.* For the purpose of the frame modulus, the frame is regarded as composed of a frame angle and a reverse angle each of the same size and thickness.

(7) *Frame modulus.* The modulus $\frac{I}{y}$ of the midship frame below the lowest tier of beams is the moment of inertia I of the frame section about the neutral axis divided by the distance y measured from the neutral axis to the extremity of the frame section, calculated without deduction for rivet and bolt holes. The modulus is measured in inch units.

(i) The required frame modulus is expressed by

$$\frac{s(d-t)\ (f_1+f_2)}{1{,}000} \qquad (2)$$

where:

s is the frame spacing in inches.

t is the vertical distance in feet measured at amidships from the top of the keel to a point midway between the top of the inner bottom at side and the top of the heel bracket (see fig. 43.15–17 (c) (7) (i)); where there is no double bottom, t is measured to a point midway between the top of the floor at center and the top of the floor at side.

f_1 is a coefficient depending on H, which, in vessels fitted with double bottoms, is the vertical distance in feet from the middle of the beam bracket of the lowest tier of beams at side to a point midway between the top of the inner bottom at side and the top of the heel bracket (see fig. 43.15–17 (c) (7) (i)); where there is no double bottom, H is measured to a point midway between the top of the floor at center and the top of the floor at side. Where the frame obtains additional strength from the form of the vessel, due allowance is made in the value of f_1.

f_2 is a coefficient depending on K, which is the vertical distance in feet from the top of the lowest tier of beams at side to a point 7 feet 6 inches above the freeboard deck at side, or, if there is

[3] The provisions of §§ 43.01–1—43.01–100, inclusive, and §§ 43.05–1—43.10–100, inclusive, apply to all vessels and for steamers, are further supplemented by §§ 43.15–1—43.15–98, inclusive. Steamers taking advantage of special classifications, such as tankers, steamers carrying timber deck cargo, lumber schooners, etc., are also subject to these requirements except as specifically modified in their separate classifications as set forth in the regulations.

TABLE 43.15-17 (c) (7) (i)

H in feet	0	7	9	11	13	15	17	19	21	23	25
f_1	9	11	12.5	15	19	24	29.5	36	43	51	59
K in feet	0	5	10	15	20	25	30	35	40	.....	.....
f_2	0	0.5	1.0	2.0	3.0	4.5	6.5	9.0	12.0	.....	.....

Intermediate values are obtained by interpolation.

a superstructure, to a point 12 feet 6 inches above the freeboard deck at side. (See fig. 43.15-17 (c) (7) (i).) The values of f_1 and f_2 are obtained from Table 43.15-17 (c) (7) (i).

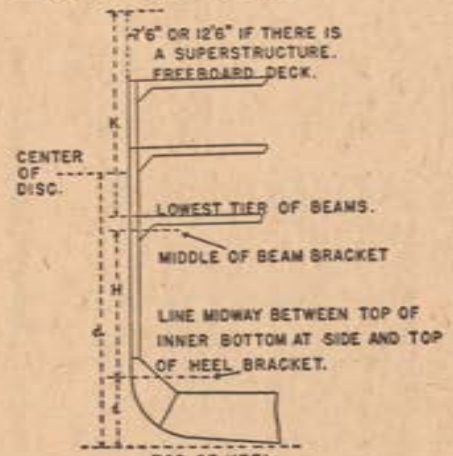


FIGURE 43.15-17 (c) (7) (i)

(ii) This formula applies where D is between 15 feet and 60 feet, both inclusive, B is between

$$\frac{L}{10}+5 \text{ and } \frac{L}{10}+20, \text{ both inclusive, } \frac{L}{D_s}$$

is between 10 and 13.5, both inclusive, and the horizontal distance from the outside of the frame to the center of the first row of pillars does not exceed 20 feet.

(iii) In single-deck vessels of ordinary form, where H does not exceed 18 feet, the frame modulus determined by the preceding method is multiplied by the factor f_3 where

$$f_3=0.50+0.05\ (H-8) \qquad (3)$$

(iv) Where the horizontal distance from the outside of the frame to the center of the first row of pillars exceeds 20 feet, the assigning authority is to be satisfied that sufficient additional strength is provided.

§ 43.15-20 Height of superstructure.

(a) The height of a superstructure is the least vertical height measured from the top of the superstructure deck to the top of the freeboard deck beams minus the difference between D and the molded depth. (See §§ 43.15-7, 43.15-10.)

§ 43.15-25 Standard height of superstructure.

(a) The standard height of a raised quarter-deck is 3 feet for vessels up to and including 100 feet in length, 4 feet for vessels 250 feet in length, and 6 feet for vessels 400 feet in length and above. The standard height of any other superstructure is 6 feet for vessels up to and including 250 feet in length and 7 feet 6 inches for vessels 400 feet in length and above. The standard height at intermediate lengths is obtained by interpolation.

§ 43.15-27 Length of superstructure (S).

(a) The length of a superstructure is the mean covered length of the parts of the superstructure which extends to the sides of the vessel and lie within lines drawn perpendicular to the extremities of the summer load waterline, as defined in § 43.15-1.

§ 43.15-30 Enclosed superstructure.

(a) A detached superstructure is regarded as inclosed only where:

(1) The enclosing bulkheads are of efficient construction. (See § 43.15-35.)

(2) The access openings in these bulkheads are fitted with class 1 or class 2 closing appliances. (See §§ 43.15-37, 43.15-40.)

(3) All other openings in sides or ends of the superstructure are fitted with efficient weathertight means of closing.

(4) Independent means of access to crew, machinery, bunker, and other working spaces within bridges and poops are at all times available when the bulkhead openings are closed.

§ 43.15-35 Superstructure bulkheads.

(a) Bulkheads at exposed ends of poops, bridges, and forecastles are deemed to be of efficient construction where the assigning authority is satisfied that, in the circumstances, they are equivalent to the following standard for vessels with minimum freeboards under which standard the stiffeners and plating are of the scantlings given in Table 43.15-35(a), the stiffeners are spaced 30 inches apart, the stiffeners on poop and bridge front bulkheads have efficient end connections, and those on after bulkheads of bridges and forecastles extend for the whole distance between the margin angles of the bulkheads.

TABLE 43.15-35 (a)—EXPOSED BULKHEADS OF SUPERSTRUCTURES OF STANDARD HEIGHT

Bridge front bulkheads, unprotected bulkheads of poops 0.4L or more in length		Bulkheads of poops partially protected or less in length than 0.4L		After bulkheads of bridges and forecastles	
Length of vessel	Bulb angle stiffeners	Length of vessel	Plain angle stiffeners	Length of vessel	Plain angle stiffeners
Feet	*Inches*	*Feet*	*Inches*	*Feet*	*Inches*
Under 160	5½ by 3 by 0.30.	Under 150	3 by 2½ by 0.30.	Under 150	2½ by 2½ by 0.26.
160	6 by 3 by 0.32.	150	3½ by 2½ by 0.32.	150	3 by 2½ by 0.28.
200	6½ by 3 by 0.34.	200	4 by 3 by 0.34.	250	3½ by 3 by 0.30.
240	7 by 3 by 0.36.	250	4½ by 3 by 0.36.	350	4 by 3 by 0.32.
280	7½ by 3 by 0.38.	300	5 by 3 by 0.38.		
320	8 by 3 by 0.40.	350	5½ by 3 by 0.42.		
360	8½ by 3 by 0.42.	400	6 by 3 by 0.44.		
400	9 by 3 by 0.44.	450	6½ by 3½ by 0.46.		
440	9½ by 3½ by 0.46.	500	7 by 3½ by 0.48.		
480	10 by 3½ by 0.48.	550	7 by 3½ by 0.50.		
520	10½ by 3½ by 0.50.				
560	11 by 3½ by 0.52.				

Length of vessel	Bulkhead plating [1]	Length of vessel	Bulkhead plating [1]	Length of vessel	Bulkhead plating [1]
Feet	*Inch*	*Feet*	*Inch*	*Feet*	*Inch*
200 and under	0.3	160 and under	0.24	160 and under	0.20
380 and above	.44	400 and above	.38	400 and above	.30

[1] For vessels intermediate in length the thicknesses of bulkhead plating are obtained by interpolation.

§ 43.15-37 Class 1 closing appliances.

(a) These appliances are of iron or steel, are in all cases to be permanently and strongly attached to the bulkhead, are framed, stiffened, and fitted so that the whole structure is of equivalent strength to the unpierced bulkhead, and are weathertight when closed. The means for securing these appliances are permanently attached to the bulkhead or to the appliances, and the latter are so arranged that they can be closed and secured from both sides of the bulkhead or from the deck above. The sills of the access openings are at least 15 inches above the deck.

§ 43.15-40 Class 2 closing appliances.

(a) These appliances are:

(1) Strongly framed hardwood hinged doors, which are not more than 30 inches wide nor less than 2 inches thick; or

(2) Shifting boards fitted for the full height of the opening in channels riveted to the bulkhead, the shifting boards being at least 2 inches thick where the width of opening is 30 inches or less, and increased in thickness at the rate of 1 inch for each additional 15 inches of width; or

(3) Portable plates of equal efficiency.

§ 43.15-43 Temporary closing appliances.

(a) Temporary closing appliances for middle line openings in the deck of an enclosed superstructure consist of

(1) A steel coaming not less than 9 inches in height efficiently riveted to the deck;

(2) Hatchway covers as required by § 43.10-15, secured by hemp lashings; and

(3) Hatchway supports as required by §§ 43.10–20, 43.10–25 and by Table 43.10–20 (a1) or 43.10–20 (a2).

§ 43.15–45 General, relative superstructures.

(a) Where exposed bulkheads of the ends of poops, bridges, and forecastles are not of efficient construction (see § 43.10–25), they are considered as nonexistent.

(b) Where in the side plating of a superstructure there is an opening not provided with permanent means of closing, the part of the superstructure in way of the opening is regarded as having no effective length.

(c) Where the height of a superstructure is less than the standard, its length is reduced in the ratio of the actual to the standard height. Where the height exceeds the standard, no increase is made in the length of the superstructure.

§ 43.15–47 Poop.

(a) Where there is an efficient bulkhead and the access openings are fitted with class 1 closing appliances (§ 43.15–37), the length to the bulkhead is effective. Where the access openings in an efficient bulkhead are fitted with class 2 closing appliances (§ 43.15–40) and the length to the bulkhead is $0.5L$ or less, 100 percent of that length is effective; where the length is $0.7L$ or more, 90 percent of that length is effective; where the length is between $0.5L$ and $0.7L$, an intermediate percentage of that length is effective; where an allowance is given for an efficient adjacent trunk (see § 43.15–57), 90 percent of the length to the bulkhead is to be taken as effective; 50 percent of the length of an open poop or of an open extension beyond an efficient bulkhead is effective.

§ 43.15–50 Raised quarter-deck.

(a) Where there is an efficient intact bulkhead, the length to the bulkhead is effective. Where the bulkhead is not intact, the superstructure is considered as a poop of less than standard height.

§ 43.15–53 Bridge.

(a) Where there is an efficient bulkhead at each end, and the access openings in the bulkheads are fitted with class 1 closing appliances, the length between the bulkheads is effective.

(b) Where the access openings in the forward bulkhead are fitted with class 1 closing appliances and the access openings in the after bulkhead with class 2 closing appliances, the length between the bulkheads is effective; where an allowance is given for an efficient trunk, adjacent to the after bulkhead (see § 43.15–57), 90 percent of the length is effective. Where the access openings in both bulkheads are fitted with class 2 closing appliances, 90 percent of the length between the bulkheads is effective. Where the access openings in the forward bulkhead are fitted with class 1 or class 2 closing appliances and the access openings in the after bulkhead have no closing appliances, 75 percent of the length between the bulkheads is effective. Where the access openings in both bulkheads have no closing appliances, 50 percent of the length is effective; 75 percent of the length of an open extension beyond the after bulkhead and 50 percent of that beyond the forward bulkhead are effective.

CROSS REFERENCE: For class 1 and class 2 closing appliances, see §§ 43.15–37, 43.15–40.

§ 43.15–55 Forecastle.

(a) Where there is an efficient bulkhead and the access openings are fitted with class 1 or class 2 closing appliances, the length to the bulkhead is effective. Where no closing appliances are fitted and the sheer forward of amidships is not less than the standard sheer, 100 percent of the length of the forecastle forward of $0.1L$ from the forward perpendicular is effective; where the sheer forward is half the standard sheer or less, 50 percent of that length is effective; and where the sheer forward is intermediate between the standard and half the standard sheer, an intermediate percentage of that length is effective; 50 percent of the length of an open extension beyond the bulkhead or beyond $0.1L$ from the forward perpendicular is effective.

CROSS REFERENCE: For class 1 and class 2 closing appliances, see §§ 43.15–37, 43.15–40.

§ 43.15–57 Trunk.

(a) A trunk or similar structure which does not extend to the sides of the vessel is regarded as efficient: *Provided*, That:

(1) The trunk is at least as strong as a superstructure.

(2) The hatchways are in the trunk deck, and comply with the requirements of §§ 43.10–1—43.10–45 and the width of the trunk deck stringer provides a satisfactory gangway and sufficient lateral stiffness.

(3) A permanent working platform fore and aft fitted with guardrails is provided by the trunk deck, or by detached trunks connected to other superstructures by efficient permanent gangways.

(4) Ventilators are protected by the trunk, by watertight covers or by equivalent means.

(5) Open rails are fitted on the weather portions of the freeboard deck in way of the trunk for at least half their length.

(6) The machinery casings are protected by the trunk, by a superstructure of standard height or by a deckhouse of the same height and of equivalent strength.

(b) Where access openings in poop and bridge bulkheads are fitted with class 1 closing appliances, 100 percent of the length of an efficient trunk reduced in the ratio of its mean breadth to B is added to the effective length of the superstructures. Where the access openings in these bulkheads are not fitted with class 1 closing appliances 90 percent is added.

(c) The standard height of a trunk is the standard height of a bridge.

(d) Where the height of the trunk is less than the standard height of a bridge, the addition is reduced in the ratio of the actual to the standard height; where the height of hatchway coamings on the trunk deck is less than the standard height of coamings (see § 43.10–10), a reduction from the actual height of trunk is to be made which corresponds to the difference between the actual and the standard height of coamings.

§ 43.15–60 Enclosed superstructure with middle line openings in the deck not provided with permanent means of closing.

(a) Where there is an enclosed superstructure with one or more middle line openings in the deck not provided with permanent means of closing (see §§ 43.10–1—43.10–45), the effective length of the superstructure is determined as follows:

(1) Where efficient temporary closing appliances are not provided for the middle line deck openings (see § 43.15–43), or the breadth of openings is 80 percent or more of the breadth B_1 of the superstructure deck at the middle of the opening, the vessel is considered as having an open well in way of each opening, and freeing ports are to be provided in way of this well. The effective length of superstructure between openings is governed by §§ 43.15–47, 43.15–53, 43.15–55.

(2) Where efficient temporary closing appliances are provided for middle line deck openings, and the breadth of openings is less than $0.8B_1$ the effective length is governed by §§ 43.15–47, 43.15–53, 43.15–55, except that where access openings in between deck bulkheads are closed by class 2 closing appliances, they are regarded as being closed by class 1 closing appliances in determining the effective length. The total effective length is obtained by adding to the length determined by subparagraph (1) of this paragraph the difference between this length and the length of the vessel modified in the ratio of

$$\frac{B_1-b}{B_1}$$ where b=breadth of deck opening

where

$$\frac{B_1-b}{B_1}$$ is greater than 0.5, it is taken as 0.5

§ 43.15–63 Deductions for superstructures.

(a) Where the effective length of superstructures is $1.0L$, the deduction from the freeboard is 14 inches at 80 feet length of vessels, 34 inches at 280 feet length, and 42 inches at 400 feet length and above; deductions at intermediate lengths are obtained by interpolation. Where the total effective length of superstructures is less than $1.0L$ the deduction is a percentage obtained from Table 43.15–63(a):

TABLE 43.15-63 (a)—TOTAL EFFECTIVE LENGTH OF SUPERSTRUCTURES (E)

Superstructures	0	0.1L	0.2L	0.3L	0.4L	0.5L	0.6L	0.7L	0.8L	0.9L	1.0L	Line
	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent	
All types with forecastle and without detached bridge	0	5	10	15	23.5	32	46	63	75.3	87.7	100	A
All types with forecastle and detached bridge [1]	0	6.3	12.7	19	27.5	36	46	63	75.3	87.7	100	B

[1] Where the effective length of a detached bridge is less than 0.2L the percentages are obtained by interpolation between lines B and A. Where no forecastle is fitted the above percentages are reduced by 5. Percentages for intermediate lengths of superstructures are obtained by interpolation.

§ 43.15–65 Sheer, general.

(a) The sheer is measured from the deck at side to a line of reference drawn parallel to the keel through the sheer line at amidships.

(b) In vessels designed to trim by the stern in service, the sheer may be measured in relation to the load line, provided an additional mark is placed at 0.25 *L* forward of amidships to indicate the assigned load line. This mark is to be similar to the load line disk amidships.

(c) In flush deck vessels and in vessels with detached superstructures the sheer is measured at the freeboard deck.

(d) In vessels with topsides of unusual form in which there is a step or break in the topsides, the sheer is considered in relation to the equivalent depth amidships. (See § 43.15–15.)

(e) In vessels with a superstructure of standard height which extends over the whole length of the freeboard deck, the sheer is measured at the superstructure deck; where the height exceeds the standard, the sheer may be considered in relation to the standard height.

(f) Where a superstructure is intact or access openings in its inclosing bulkheads are fitted with class 1 closing appliances (§ 43.15–37), and the superstructure deck has at least the same sheer as the exposed freeboard deck, the sheer of the enclosed portion of the freeboard deck is not taken into account.

§ 43.15–67 Standard sheer profile.

(a) The ordinates (in inches) of the standard sheer profile are given in Table 43.15–67 (a), where *L* is the number of feet in the length of the vessel.

TABLE 43.15-67 (a)

Station	Ordinate	Factor
A. P.[1]	0.1 *L*+10	1
1/6 L from A. P.	.0445*L*+ 4.45	4
1/3 L from A. P.	.011 *L*+ 1.1	2
Amidships	0	4
1/3 L from F. P.[2]	.022 *L*+ 2.2	2
1/6 L from F. P.	.089 *L*+ 8.9	4
F. P.	.2 *L*+20	1

[1] A. P.=After end of summer load waterline.
[2] F. P.=Fore end of summer load waterline.

§ 43.15–70 Measurement of variations from standard sheer profile.

(a) Where the sheer profile differs from the standard, the 7 ordinates of each profile are multiplied by the appropriate factors given in the table of ordinates. The difference between the sums of the respective products, divided by 18, measures the deficiency or excess of sheer. Where the after half of the sheer profile is greater than the standard and the forward half is less than the standard, no credit is allowed for the part in excess and the deficiency only is measured.

(b) Where the forward half of the sheer profile exceeds the standard, and the after portion of the sheer profile is not less than 75 percent of the standard, credit is allowed for the part in excess; where the after part is less than 50 percent of the standard no credit is given for the excess sheer forward. Where the after sheer is between 50 percent and 75 percent of the standard, intermediate allowances may be granted for excess sheer forward.

§ 43.15–73 Correction for variations from standard sheer profile.

(a) The correction for sheer is the deficiency or excess of sheer (see § 43.15–70(a)) multiplied by $0.75-\frac{S}{2L}$ where S is the total length of superstructure, as defined in § 43.15–27.

§ 43.15–75 Addition for deficiency in sheer.

Where the sheer is less than the standard, the correction for deficiency in sheer (see § 43.15–73) is added to the freeboard.

§ 43.15–77 Deduction for excess sheer.

(a) In flush deck vessels and in vessels where an enclosed superstructure covers 0.1 *L* before and 0.1 *L* abaft amidships, the correction for excess of sheer (see § 43.15–73) is deducted from the freeboard; in vessels with detached superstructures where no enclosed superstructure covers amidships, no deduction is made from the freeboard; where an enclosed superstructure covers less than 0.1 *L* before and 0.1 *L* abaft amidships, the deduction is obtained by interpolation. The maximum deduction for excess sheer is 1½ inches at 100 feet and increases at the rate of 1½ inches for each additional 100 feet in the length of the vessel.

§ 43.15–80 Standard round of beam.

(a) The standard round of beam of the freeboard deck is one-fiftieth of the breadth of the vessel.

§ 43.15–83 Round of beam correction.

(a) Where the round of beam of the freeboard deck is greater or less than the standard, the freeboard is decreased or increased respectively by one-fourth of the difference between the actual and the standard round of beam, multiplied by the proportion of the length of the freeboard deck not covered by enclosed superstructures. Twice the standard round of beam is the maximum for which allowance is given.

§ 43.15–85 Summer freeboard.

(a) The minimum freeboard in summer is the freeboard derived from the freeboard table after corrections for departures from the standards and after deduction for superstructures. The freeboard in salt water measured from the intersection of the upper surface of the freeboard deck with the outer surface of the shell is not to be less than 2 inches.

§ 43.15–87 Tropical freeboard.

(a) Except as provided in paragraph (b) of this section, the minimum freeboard in the tropical zone is the freeboard obtained by a deduction from the summer freeboard of one-fourth inch per foot of summer draft measured from the top of the keel to the center of the disk. The freeboard in salt water measured from the intersection of the upper surface of the freeboard deck with the outer surface of the shell is not to be less than 2 inches.

(b) For vessels 400 feet and above in length engaged in coastwise voyages, the area on the west coast of the United States eastward of a rhumb line from the point 30° N. latitude, 120° W. longitude to the point 33° N. latitude, 123° W. longitude, and a line thence along the meridian 123° W. longitude to its intersection with land at 38° N. latitude shall be considered an extension of the seasonal tropical zone as defined in § 43.40–1(f)(5)(ii), and the minimum freeboard is determined as in paragraph (a) of this section. For vessels above 300 feet and up to 400 feet in length engaged in coastwise voyages the minimum freeboard in this area during the tropical seasons is the freeboard obtained by deduction from the summer freeboard of $\left(\frac{L}{400}-0.75\right)$ inch per foot of summer draft, and it shall be noted on the coastwise load line certificate when this provision has been applied. The freeboard in salt water measured from the intersection of the upper surface of the freeboard deck with the outer surface of the shell is not to be less than 2 inches.

§ 43.15–90 Winter freeboard.

(a) Except as provided in paragraph (b) of this section, the minimum freeboard in winter is the freeboard obtained by an addition to the summer freeboard of one-fourth inch per foot of summer draft, measured from the top of the keel to the center of the disk.

(b) For vessels 400 feet and above in length engaged in coastwise voyages, the area on the east coast of the United States west of a line drawn south along the meridian at 68°30′ W. longitude from where it intersects the coast to 40° N. latitude, thence along a rhumb line to the point 36° N. latitude, 73° W. longitude shall be considered an extension of the summer zone and the minimum freeboard shall be the summer freeboard. For vessels above 300 feet and up to 400 feet in length engaged in coastwise voyages the minimum freeboard, when in this area, in winter, is the freeboard obtained by an addition to the summer freeboard of $\left(1.00-\frac{L}{400}\right)$ inch per foot of summer draft, and it shall be noted

on the coastwise load line certificate when this provision has been applied.

§ 43.15–93 Winter North Atlantic freeboard.

(a) The minimum freeboard for vessels not exceeding 330 feet in length on voyages across the North Atlantic from a port or place of departure north of latitude 36° N. to a port or place of arrival north of latitude 36° N., regardless of the route of the vessel while it is in either of the northern seasonal winter zones during the winter season, shall be the winter freeboard plus 2 inches. For vessels over 330 feet in length it is the winter freeboard.

§ 43.15–95 Fresh-water freeboard.

(a) The minimum freeboard in fresh water of unit density is the freeboard obtained by deducting from the minimum freeboard in salt water $\frac{\Delta}{40T}$ inches, where

Δ=displacement in salt water in tons at the summer load waterline, and T=tons per inch immersion in salt water at the summer load waterline.

(b) Where the displacement at the summer load waterline cannot be certified, the deduction is to be one-fourth inch per foot of summer draft, measured from the top of the keel to the center of the disk.

§ 43.15–97 Freeboard table for steamers.

(a) Table 43.15–97(a) gives the basic minimum summer freeboard for steamers which comply with the standards in this part.

TABLE 43.15–97 (a)—BASIC MINIMUM SUMMER FREEBOARD FOR STEAMERS

L (feet)	Freeboard (inches)	L (feet)	Freeboard (inches)
80	8.0	550	116.4
90	9.0	560	119.1
100	10.0	570	121.8
110	11.0	580	124.4
120	12.0	590	127.0
130	13.0	600	129.5
140	14.2	610	132.0
150	15.5	620	134.4
160	16.9	630	136.8
170	18.3	640	139.1
180	19.8	650	141.4
190	21.4	660	143.7
200	23.1	670	145.9
210	24.8	680	148.1
220	26.6	690	150.2
230	28.5	700	152.3
240	30.3	710	154.4
250	32.3	720	156.4
260	34.4	730	158.5
270	36.5	740	160.5
280	38.7	750	162.5
290	41.0	760	164.4
300	43.4	770	166.3
310	45.9	780	168.2
320	48.4	790	170.1
330	51.0	800	172.0
340	53.7	810	173.8
350	56.5	820	175.6
360	59.4	830	177.4
370	62.4	840	179.2
380	65.4	850	180.9
390	68.4	860	182.6
400	71.5	870	184.3
410	74.6	880	186.0
420	77.8	890	187.7
430	80.9	900	189.3
440	84.0	910	190.9
450	87.1	920	192.5
460	90.2	930	194.1
470	93.3	940	195.7
480	96.3	950	197.3
490	99.3	960	198.9
500	102.3	970	200.4
510	105.2	980	201.9
520	108.1	990	203.4
530	110.9	1,000	204.9
540	113.7	[1]	[1]

[1] Vessels above 1,000 feet are to be dealt with by the administration.

(b) The minimum freeboards for flush deck steamers are obtained by an addition to Table 43.15–97 (a) at the rate of 1½ inches for every 100 feet of length.

(c) The freeboards at intermediate lengths are obtained by interpolation.

(d) Where c exceeds 0.68, the freeboard is multiplied by the factor

$$\frac{c+0.68}{1.36} \quad (1)$$

(e) Where D exceeds $\frac{L}{15}$ the freeboard is increased by $\left(D-\frac{L}{15}\right)R$ inches, where R is $\frac{L}{130}$ at lengths less than 390 feet, and 3 at 390 feet length and above.

(f) In a vessel with an enclosed superstructure covering at least $0.6L$ amidships with a complete trunk or with a combination of intact partial superstructures and trunk which extends all fore and aft, where D is less than $\frac{L}{15}$ the freeboard is reduced at the above rate.

(g) Where the height of superstructures or trunk is less than the standard height, the reduction is in the ratio of the actual to the standard height.

(h) Where the actual depth to the surface of the freeboard deck amidships is greater or less than D, the difference between the depths (in inches) is added to or deducted from the freeboard.

§ 43.15–98 Reduced freeboards for steamers having superior design and operational features, and engaged on United States coastwise and/or intercoastal voyages.

(a) Subject to compliance with the additional conditions in paragraph (b) of this section but otherwise in accordance with the usual conditions of assignment, the freeboards of steamers over 370 feet in length, engaged in U.S. coastwise and/or intercoastal voyages, may be computed from the lesser tabular values given by the Table 43.15–98(a) in lieu of those given by Table 43.15–97(a).

TABLE 43.15–98(a)—REDUCED BASIC MINIMUM SUMMER FREEBOARDS FOR STEAMERS ON UNITED STATES COASTWISE AND/OR INTERCOASTAL VOYAGES

L (feet)	Freeboard inches	L (feet)	Freeboard inches
370	62.4	640	126.1
380	64.8	650	128.1
390	67.2	660	130.0
400	69.6	670	131.8
410	72.0	680	133.6
420	74.5	690	135.4
430	77.1	700	137.1
440	79.7	710	138.8
450	82.3	720	140.5
460	84.9	730	142.2
470	87.5	740	143.8
480	90.0	750	145.4
490	92.5	760	146.9
500	95.0	770	148.4
510	97.5	780	149.9
520	99.9	790	151.4
530	102.3	800	152.8
540	104.7	810	154.2
550	107.0	820	155.6
560	109.3	830	157.0
570	111.5	840	158.3
580	113.7	850	159.6
590	115.9	860	160.9
600	118.0	870	162.2
610	120.1	880	163.5
620	122.1	890	164.8
630	124.1	900	166.1

TABLE 43.15–98(a)—REDUCED BASIC MINIMUM SUMMER FREEBOARDS FOR STEAMERS ON UNITED STATES COASTWISE AND/OR INTERCOASTAL VOYAGES—Continued

L (feet)	Freeboard inches	L (feet)	Freeboard inches
910	167.3	970	174.4
920	168.5	980	175.5
930	169.7	990	176.6
940	170.9	1000	177.6
950	172.1	[1]	[1]
960	173.3		

[1] Vessels above 1,000 feet are to be dealt with by the administration.

(b) In order to be eligible for the reduced freeboards permitted by this section, vessels shall comply with the following supplementary conditions:

(1) Weather deck hatch covers shall be of steel construction, sealed watertight, without need for tarpaulins, as provided by § 43.10–5(b). Associated hatch coamings shall be at least of standard height, as provided by § 43.10–10.

(2) Vessels shall be fitted with forecastles having an efficient bulkhead with effective Class 1 or Class 2 closing appliances. Forecastles of standard height or greater shall extend for at least 0.07L. If a forecastle is of less than standard height, but not less than 5.5 feet in height, the product of its length and height, in feet squared, shall be at least equal to 0.50L+50 times the deficiency in height in feet. Forecastles may not be less than 5.5 feet in height for credit under this subparagraph.

(3) Alternatively, vessels not having creditable forecastles but having sufficient excess sheer forward, are eligible for these reduced freeboards. For this purpose the sheer in inches at ⅙L from the forward perpendicular shall be at least 0.089L+8.9+⅓ times the difference between the tabular freeboard obtained from Table 43.15–97(a) and that obtained from Table 43.15–98(a). Similarly, the sheer at the forward perpendicular shall be at least 0.2L+20 plus the difference between the tabular freeboards obtained from Tables 43.15–97(a) and 43.15–98(a).

(4) Vessels shall be subdivided and shall be operated with sufficient stability to maintain a one compartment standard of watertight subdivision and damage stability at drafts up to and including the resulting load draft. For determining compliance with this requirement, the specific standards laid down in Parts 73 and 74 of Subchapter H (Passenger Vessels) of this chapter, as they apply to a required factor of subdivision of 1.0, shall be used, with the exception however, that the cargo space permeabilities specified by §§ 73.10–5(c) and 74.10–15(c) of this chapter shall be suitably increased when the vessel is particularly engaged in the carriage of cargoes which result in a higher value. The related plans, calculations and data, including the stability instructions called for by Subpart 74.20, shall be submitted to the Commandant (MMT), who will then advise the American Bureau of Shipping, or other authorized assigning authority, as to the final acceptability of the subdivision at the proposed draft.

(5) Vessels shall be structurally suitable for the resulting load draft.

Subpart 43.20—Load Lines for Sailing Vessels [4]

§ 43.20–1 Lines to be used on sailing vessels in connection with the disk.

(a) Winter and tropical load lines are not marked on sailing vessels. The maximum load lines to which sailing vessels may be laden in salt water in winter and in the tropical zone is the center of the disk. (See fig. 43.20–1 (a).)

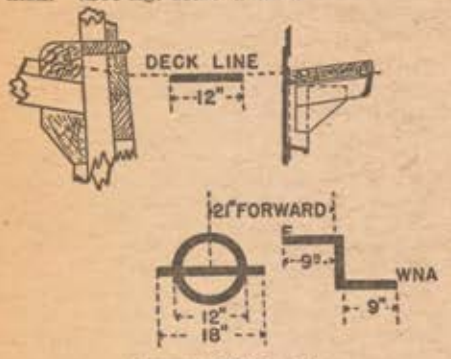


FIGURE 43.20–1 (a)

§ 43.20–5 Conditions of assignment of sailing vessel load lines.

(a) The conditions of assignment for sailing vessels are those contained in §§ 43.10–1—43.10–100.

§ 43.20–10 Computation of freeboard, sailing vessels.

(a) Freeboards are computed from the freeboard table for sailing vessels in the same manner as the freeboards for steamers are computed from the freeboard table for steamers, except as provided by §§ 43.20–15—43.20–45.

§ 43.20–15 Depth for freeboard, sailing vessels (D).

(a) In sailing vessels having a greater rate of rise of floor than 1½ inches per foot, the vertical distance from the top of keel (§ 43.15–7) is reduced by half the difference between the total rise of floor at the half breadth of the vessel and the total rise of 1½ inches per foot; 2½ inches per foot of half breadth is the maximum rate of rise for which a deduction is made.

(b) Where the form at the lower part of the midship section is of a hollow character, or thick garboards are fitted, the depth is measured from the point where the line of the flat of the bottom continued inwards cuts the side of the keel.

(c) The depth used with the freeboard table is to be taken as not less than $\frac{L}{12}$.

[4] The provisions of §§ 43.01–1—43.01–100 and 43.05–1—43.15–97, inclusive, apply to sailing vessels, except as modified by §§ 43.20–1—43.20–45, inclusive.

§ 43.20–20 Coefficient of fineness, sailing vessels (c).

(a) The coefficient used with the freeboard table for sailing vessels is to be taken as not less than 0.62 and not greater than 0.72.

§ 43.20–25 Superstructures in wood sailing vessels.

(a) In wood sailing vessels the construction and closing arrangements of superstructures for which deductions are made from the freeboard are to be to the satisfaction of the assigning authority.

§ 43.20–30 Deductions for sailing vessel superstructures.

(a) Where the effective length of superstructures on sailing vessels is 1.0L, the deduction from the freeboard is 3 inches at 80 feet length of vessel, and 28 inches at 330 feet length and above; deductions in intermediate lengths are obtained by interpolation. Where the total effective length of superstructures is less than 1.0L, the deduction is a percentage obtained from Table 43.20–30 (a).

TABLE 43.20–30 (a)—TOTAL EFFECTIVE LENGTH OF SUPERSTRUCTURES (E)

Type of superstructures	0	0.1L	0.2L	0.3L	0.4L	0.5L	0.6L	0.7L	0.8L	0.9L	1.0L	Line
	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent	
All types without bridge	0	7	13	17	23.5	30	47½	70	80	90	100	A
All types with bridge [1]	0	7	14.7	22	32	42	56	70	80	90	100	B

[1] Where the effective length of bridge is less than 0.2L, the percentages are obtained by interpolation between lines B and A. Percentages for intermediate lengths of superstructures are obtained by interpolation.

§ 43.20–35 Minimum freeboards for sailing vessels.

(a) No addition to the freeboard is required for winter freeboard, nor is a deduction permitted for tropical freeboard.

(b) An increase in freeboard of 3 inches is made for voyages across the North Atlantic north of latitude 36° N. during the winter months.

(c) In computing the fresh water freeboard for a wood vessel, the draft is measured from the lower edge of the rabbet of keel to the center of the disk.

§ 43.20–40 Freeboard table for sailing vessels.

(a) Table 43.20–40(a) gives the basic minimum summer, winter, and tropical freeboards for iron and steel flush deck sailing vessels, which comply with the standards in this part.

TABLE 43.20–40 (a)—MINIMUM SUMMER, WINTER, AND TROPICAL FREEBOARDS FOR IRON AND STEEL FLUSH DECK SAILING VESSELS

L (feet)	Freeboard	L (feet)	Freeboard	L (feet)	Freeboard
	Inches		Inches		Inches
80	9.2	170	28.2	260	50.8
90	11.0	180	30.6	270	53.5
100	12.9	190	33.0	280	56.3
110	14.9	200	35.4	290	59.1
120	17.0	210	37.9	300	61.9
130	19.1	220	40.4	310	64.7
140	21.3	230	42.9	320	67.6
150	23.5	240	45.5	330	70.5
160	25.8	250	48.1		

(b) The freeboards at intermediate lengths are obtained by interpolation.

(c) Where c exceeds 0.62 the freeboard is multiplied by the factor

$$\frac{c+0.62}{1.24} \quad (1)$$

(d) Where D exceeds $\frac{L}{12}$ the freeboard is increased by

$$\left(D-\frac{L}{12}\right)\times\left(1+\frac{L}{250}\right) \text{ inches.} \quad (2)$$

(e) Where the actual depth to the surface of the freeboard deck amidships is greater or less than D, the difference between the depths (in inches) is added to or deducted from the freeboard.

§ 43.20–45 Freeboard for wood sailing vessels.

(a) The freeboard for a wood sailing vessel is the final freeboard the vessel would obtain if she were of iron or steel, with the addition of such penalties as the assigning authority may determine, having regard to the classification, construction, age, and condition of the vessel.

Subpart 43.25—Load Lines for Steamers Carrying Timber Deck Cargoes [5]

§ 43.25–1 Definitions.

(a) *Timber deck cargo.* The term "timber deck cargo" means a cargo of timber carried on an uncovered part of a freeboard or superstructure deck. The term does not include wood pulp or similar cargo.

(b) *Timber load line.* A timber load line is a special load line to be used only when the vessel is carrying a timber deck cargo in compliance with the requirements in this subpart.

§ 43.25–5 Marks on the vessel's sides; timber cargo; timber load lines.

(a) The lines which indicate the maximum timber load lines in different circumstances and at different seasons are to be horizontal lines, 9 inches in length and 1 inch in breadth, which extend from and are at right angles to, a vertical line marked 21 inches abaft the center of the disk. (See fig. 43.25–5(a).) They are to be marked and verified similarly

[5] The provisions of §§ 43.01–1—43.01–100, inclusive, and §§ 43.05–1—43.15–97, inclusive, also apply to steamers marked to carry timber deck cargoes except as they are modified by §§ 43.25–1—43.30–5, inclusive.

to the ordinary load lines. (See §§ 43.05–20—43.05–30.)

(b) The summer timber load line is indicated by the upper edge of a line marked *"LS."*

(c) The winter timber load line is indicated by the upper edge of a line marked *"LW."*

(d) The winter North Atlantic timber load line is indicated by the upper edge of a line marked *"LWNA."*

(e) The tropical timber load line is indicated by the upper edge of a line marked *"LT."*

(f) The fresh water timber load line in summer is indicated by the upper edge of a line marked *"LF."* The difference between the fresh water timber load line in summer and the summer timber load line is the allowance to be made for loading in fresh water at the other timber load lines. The fresh water timber load line in the tropical zone is

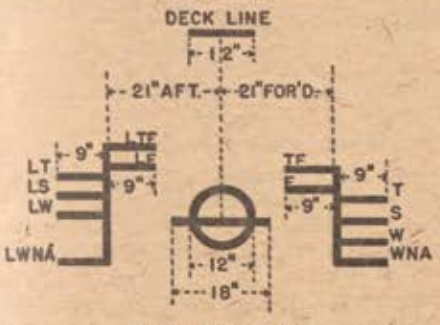


FIGURE 43.25–5 (a)

indicated by the upper edge of a line marked "LTF." [4]

§ 43.25–10 Construction of vessel; timber cargo.

(a) The structure of the vessel is to be of sufficient strength for the deeper draft allowed and for the weight of the deck cargo.

§ 43.25–15 Superstructures; timber cargo.

(a) The vessel is to have a forecastle of at least standard height and at least 7 percent of the length of the vessel, and, in addition, a poop, or a raised quarter deck with a strong steel hood or deckhouse fitted aft.

§ 43.25–20 Machinery casings; timber cargo.

(a) Machinery casings on the freeboard deck are to be protected by a superstructure of at least standard height, unless the machinery casings are of sufficient strength and height to permit of the carriage of timber alongside.

§ 43.25–25 Double bottom tanks; timber cargo.

(a) Double bottom tanks where fitted within the midship half length of the vessel are to have adequate longitudinal subdivision.

[4] Where seagoing steamers navigate a river or inland water, deeper loading is permitted corresponding to the weight of fuel, etc., required for consumption between the point of departure and the open sea.

§ 43.25–30 Bulwarks; timber cargo.

(a) The vessel must be fitted either with permanent bulwarks at least 3 feet 3 inches high, specially stiffened on the upper edge and supported by strong bulwark stays attached to the deck in the way of the beams and provided with necessary freeing ports or with efficient rails of the same height as the above and of specially strong construction.

§ 43.25–35 Deck openings covered by timber deck cargo.

(a) Openings to spaces below the freeboard deck are to be securely closed and battened down. All fittings, such as hatchway beams fore-and-afters, and covers are to be in place. Where hold ventilation is needed, the ventilators are to be efficiently protected.

§ 43.25–40 Stowage; timber cargo.

(a) The wells on the freeboard deck are to be filled with timber stowed as solidly as possible, to at least the standard height of a bridge.

(b) On a vessel within a seasonal winter zone in winter, the height of the deck cargo above the freeboard deck is not to exceed one-third of the extreme breadth of the vessel.

(c) All timber deck cargo is to be compactly stowed, lashed, and secured. It must not interfere in any way with the navigation and necessary work of the vessel, or with the provision of a safe margin of stability at all stages of the voyage, regard being given to additions of weight, such as those due to absorption of water and to losses of weight such as those due to consumption of fuel and stores.

§ 43.25–45 Protection of crew, access to machinery space; timber cargo.

(a) Safe and satisfactory access to the quarters of the crew, to the machinery space, and to all other parts used in the necessary work of the vessel is to be available at all times. Deck cargo in way of openings which give access to such parts is to be so stowed that the openings can be properly closed and secured against the admission of water. Efficient protection for the crew in the form of guardrails, or lifelines, spaced not more than 12 inches apart vertically, is to be provided on each side of the deck cargo to a height of at least 4 feet above the cargo. The cargo is to be made sufficiently level for gangway purposes.

§ 43.25–50 Steering arrangements; timber cargo.

(a) Steering arrangements are to be effectively protected from damage by cargo and, as far as practicable, are to be accessible. Efficient provision is to be made for steering in the event of a breakdown in the main steering arrangements.

§ 43.25–55 Uprights; timber cargo.

(a) Uprights, when required by the nature of the timber, are to be of adequate strength and may be of wood or metal; the spacing is to be suitable for the length and character of timber carried, but is not to exceed 10 feet. Strong angles or metal sockets efficiently secured to the stringer plate or equally efficient means are to be provided for securing the uprights.

§ 43.25–60 Lashings; timber cargo.

(a) Timber deck cargo is to be efficiently secured throughout its length by independent overall lashings spaced not more than 10 feet apart.

(b) Eye plates for these lashings are to be riveted to the sheer strake at intervals of not more than 10 feet, the distance from an end bulkhead of a superstructure to the first eye plate being not more than 6 feet 6 inches. Additional eye plates may be fitted on the stringer plate.

(c) Overall lashings are to be in good condition and are to be not less than three-fourths inch close link chain or flexibile wire rope of equivalent strength, fitted with sliphooks and stretching screws, which are to be accessible at all times. Wire rope lashings are to have a short length of long link chain to permit the length of lashings to be regulated.

(d) When timber is in lengths less than 12 feet, the spacing of the lashings is to be reduced to suit the length of timber or other suitable provision made.

(e) When the spacing of the lashings is 5 feet or less, the size of the lashing may be reduced, but not less than one-half inch chain or equivalent wire rope is to be used.

(f) All fittings required for securing the lashings are to be of strength corresponding to the strength of the lashings.

(g) On superstructure decks, uprights, where fitted, are to be about 10 feet apart and are to be secured by athwartship lashings of ample strength.

§ 43.25–65 Plans; timber cargo.

(a) Plans showing the fittings and arrangements for stowing and securing timber deck cargoes in compliance with the foregoing conditions and §§ 43.25–1—43.25–60 are to be submitted to the assigning authority.

§ 43.25–70 Computation of freeboard; timber cargo.

(a) Where the assigning authority is satisfied that the vessel is suitable and that the conditions and arrangements are at least equal to the foregoing requirements for the carriage of timber deck cargo, the summer freeboards computed in accordance with the rules and tables in §§ 43.15–1—43.15–97, may be modified to give special timber freeboards by substituting the following percentages for those in § 43.15–63:

TABLE 43.25–70 (a)—TOTAL EFFECTIVE LENGTH OF SUPERSTRUCTURES

	0	0.1*L*	0.2*L*	0.3*L*	0.4*L*	0.5*L*	0.6*L*	0.7*L*	0.8*L*	0.9*L*	1.0*L*
All types	Percent 20	Percent 30.75	Percent 41.5	Percent 52.25	Percent 63	Percent 69.25	Percent 75.5	Percent 81.5	Percent 87.5	Percent 93.75	Percent 100

(b) The winter timber freeboard is to be obtained by adding to the summer timber freeboard one-third of an inch per foot of the molded summer timber draft.

(c) The winter North Atlantic timber freeboards are the winter North Atlantic freeboards prescribed in § 43.15–93.

(d) The tropical timber freeboard is to be obtained by deducting from the summer timber freeboard one-quarter of an inch per foot of the molded summer timber draft.

CROSS REFERENCE: For requirements for the carriage of timber deck cargo, see §§ 43.25–1—43.25–65.

Subpart 43.30—Load Lines for Tankers [7]

NOTE: The term "tanker" includes all steamers specially constructed for the carriage of liquid cargoes in bulk.

§ 43.30–1 Tanker load line markings.

(a) Tankers assigned load lines computed in accordance with Table 43.30–70 (a) (valid for both United States' domestic and international voyages) shall be marked as provided by §§ 43.05–5 to 43.05–30, inclusive, and as shown in Figure 43.05–5(a).

(b) Tankers assigned load lines computed in accordance with Table 43.30–75 (a) (valid only for United States coastwise and/or intercoastal voyages) shall be marked abaft the disk as shown in Figure 43.05–15(d).

(c) Tankers marked in accordance with paragraph (b) of this section but which may also engage in foreign voyages may carry both the markings called for by paragraphs (a) and (b) of this section when on United States coastwise and/or intercoastal voyages, except that, in such cases, the line through the center of the disk shall correspond to the summer load line computed in accordance with Table 43.30–70(a). Tankers departing on foreign voyages shall only bear the marks forward of the disk called for by paragraph (a) of this section.

§ 43.30–5 Construction of tanker.

(a) The structure of the vessel is to be of sufficient strength for the increased draft corresponding to the freeboard assigned.

§ 43.30–10 Forecastle; tanker.

(a) The vessel is to have a forecastle of which the length is not less than 7 percent of the length of the vessel and the height is not less than the standard height.

§ 43.30–15 Machinery casings; tanker.

(a) The openings in machinery casings on the freeboard deck are to be fitted with steel doors. The casings are to be protected by an enclosed poop or bridge of at least standard height or by a deckhouse of equal height and of equivalent strength. The bulkheads at the ends of these structures are to be of the scantlings required for bridge front bulkheads. All entrances to the structures from the freeboard deck at to be fitted with effective closing appliances and the sills are to be at least 18 inches above the deck. Exposed machinery casings on the superstructure deck are to be of substantial construction, and all openings in them are to be fitted with steel closing appliances permanently attached to the casings and capable of being closed and secured from both sides; the sills of such openings are to be at least 15 inches above the deck. Fiddley openings are to be as high above the superstructure deck as is reasonable and practicable and are to have strong steel covers permanently attached in their proper positions.

§ 43.30–20 Gangway; tanker.

(a) An efficiently constructed permanent gangway of sufficient strength for its exposed position is to be fitted fore and aft at the level of the superstructure deck between the poop and midship bridge, and when crew are berthed forward, from the bridge to the forecastle, or other equivalent means of access may be provided to carry out the purpose of the gangway, such as passages below deck.

§ 43.30–25 Protection of crew; access to machinery space; tanker.

(a) Safe and satisfactory access from the gangway level to the quarters of the crew, the machinery space, and all other parts used in the necessary work of the vessel is to be available at all times. This section does not apply to pumprooms entered from the freeboard deck, when fitted with class 1 closing appliances.

CROSS REFERENCE: For class 1 closing appliances, see § 43.15–37.

§ 43.30–30 Hatchways; tanker.

(a) All exposed hatchways on the freeboard deck and on the deck of expansion trunks are to be closed watertight by efficient steel covers. Hatchways on the freeboard deck within a forecastle which is closed at the after end with a bulkhead and closing appliances no less effective than Class 2 may be fitted with wood covers, coamings, and closing appliances in accordance with § 43.10–55, provided hatchways on the forecastle deck are closed watertight by efficient steel covers.

§ 43.30–35 Ventilators; tanker.

(a) Ventilators to spaces below the freeboard deck are to be of ample strength or are to be protected by superstructures or equally efficient means.

§ 43.30–40 Freeing arrangements; tanker.

(a) Vessels with bulwarks are to have open rails fitted for at least half the length of the exposed portion of the weather deck or other effective freeing arrangements. The upper edge of the sheer strake is to be kept as low as practicable and preferably not higher than the upper edge of the gunwale bar.

(b) Where superstructures are connected by trunks, open rails are to be fitted for the whole length of the weather portions of the freeboard deck.

§ 43.30–45 Plans; tanker.

(a) Plans showing proposed fittings and arrangements are to be submitted to the assigning authority for approval.

§ 43.30–50 Computation of freeboard; tanker.

(a) When the assigning authority is satisfied that the foregoing requirements are fulfilled, the summer freeboard may be computed from the table for tankers; all corrections except those for flushdeck steamers, detached superstructures, excess sheer, and winter voyages across the North Atlantic are to be made in accordance with §§ 43.15–1—43.15–97.

§ 43.30–55 Deductions for detached superstructures; tankers.

(a) When the total effective length of superstructure is less than 1.0*L*, the deduction is a percentage of that for a superstructure of length 1.0*L*, and is obtained from Table 43.30–55(a).

TABLE 43.30–55 (a)—TOTAL EFFECTIVE LENGTH OF SUPERSTRUCTURES

	0	0.1*L*	0.2*L*	0.3*L*	0.4*L*	0.5*L*	0.6*L*	0.7*L*	0.8*L*	0.9*L*	1.0*L*
	Percent	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*
All types	0	7	14	21	31	41	52	63	75.3	87.7	100

§ 43.30–60 Deduction for excess sheer; tanker.

(a) Where the sheer is greater than the standard, the correction for excess sheer (see § 43.15–73) is deducted from the freeboard for all tankers. Section 43.15–77 does not apply except that the maximum deduction for excess sheer is 1½ inches at 100 feet and increases at the rate of 1½ inches for each additional 100 feet in the length of the vessel.

§ 43.30–65 Winter North Atlantic freeboard; tanker.

(a) The minimum freeboard for tankers on voyages across the North Atlantic from a port or place of departure north of latitude 36° N. to a port or place of arrival north of latitude 36° N., regardless of the route of the vessel while it is in either of the northern seasonal winter zones during the winter season, shall be the winter freeboard plus an addition at a rate of one inch per 100 feet in length.

§ 43.30–70 Freeboard table for tankers.

(a) Table 43.30–70(a) gives the basic minimum summer freeboard for tankers which comply with the standards in this part.

[7] The provisions of §§ 43.01–1—43.01–100, inclusive, and §§ 43.05–1—43.05–97, inclusive also apply to tankers except as they are modified by §§ 43.30–1—43.30–70, inclusive.

TABLE 43.30-70(a)—BASIC MINIMUM FREEBOARD FOR TANKERS

L (feet)	Freeboard (inches)	L (feet)	Freeboard (inches)
190	21.5	610	110.1
200	23.1	620	111.7
210	24.7	630	113.1
220	26.3	640	114.5
230	28.0	650	115.9
240	29.7	660	117.3
250	31.5	670	118.6
260	33.3	680	119.9
270	35.2	690	121.2
280	37.1	700	122.5
290	39.1	710	123.7
300	41.1	720	124.9
310	43.1	730	126.1
320	45.1	740	127.3
330	47.1	750	128.5
340	49.2	760	129.6
350	51.3	770	130.7
360	53.5	780	131.8
370	55.7	790	132.9
380	57.9	800	134.0
390	60.2	810	135.1
400	62.5	820	136.2
410	64.9	830	137.2
420	67.4	840	138.2
430	69.9	850	139.2
440	72.5	860	140.1
450	75.1	870	141.0
460	77.7	880	141.9
470	80.2	890	142.8
480	82.7	900	143.7
490	85.1	910	144.5
500	87.5	920	145.3
510	89.8	930	146.1
520	92.1	940	146.9
530	94.3	950	147.7
540	96.5	960	148.5
550	98.6	970	149.2
560	100.7	980	149.8
570	102.7	990	150.4
580	104.6	1,000	151.0
590	106.5	[1]	[1]
600	108.4		

[1] Vessels above 1,000 feet are to be dealt with by the Administration.

§ 43.30-75 Freeboard table for tankers on United States coastwise and/or intercoastal voyages.

(a) Tankers which are structurally qualified to be operated at the resulting deeper drafts may be assigned load lines, valid only for United States coastwise and/or intercoastal voyages, which have been computed on the basis of Table 43.30-75(a) in lieu of Table 43.30-70(a).

TABLE 43.30-75(a)—BASIC MINIMUM FREEBOARD FOR TANKERS ON UNITED STATES COASTWISE AND/OR INTERCOASTAL VOYAGES

L	Freeboard	L	Freeboard	L	Freeboard
Feet	Inches	Feet	Inches	Feet	Inches
(1)	(1)	540	88.7	780	127.6
310	43.0	550	90.7	790	128.8
320	44.7	560	92.7	800	130.0
330	46.3	570	94.7	810	131.1
340	47.9	580	96.6	820	132.2
350	49.5	590	98.5	830	133.3
360	51.1	600	100.3	840	134.4
370	52.7	610	102.1	850	135.5
380	54.4	620	103.9	860	136.5
390	56.3	630	105.7	870	137.5
400	58.3	640	107.4	880	138.5
410	60.4	650	109.1	890	139.5
420	62.5	660	110.8	900	140.5
430	64.6	670	112.4	910	141.5
440	66.8	680	114.0	920	142.4
450	69.0	690	115.5	930	143.3
460	71.3	700	117.0	940	144.3
470	73.5	710	118.4	950	145.2
480	75.7	720	119.8	960	146.1
490	77.9	730	121.2	970	147.0
500	80.1	740	122.6	980	147.8
510	82.3	750	123.9	990	148.6
520	84.5	760	125.2	1,000	149.4
530	86.6	770	126.4	(2)	(2)

[1] For vessels up to 300 feet the freeboards given by Table 43.30-70(a) apply.
[2] Vessels above 1,000 feet are to be specially considered.

Subpart 43.35—Lumber Schooners

§ 43.35-1 Load line marks for vessels specially constructed for the carriage of complete cargoes of timber (lumber schooner type).

(a) Load lines for existing vessels propelled by either sail or steam which have been specially constructed to carry complete cargoes of timber (that is, of the lumber schooner type) when carrying a complete cargo of timber will be marked with a load line as provided in § 43.01-15. The mark is illustrated by figure 43.35-1(a).

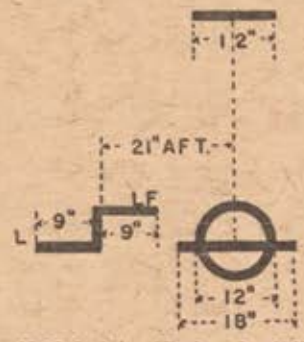


FIGURE 43.35-1 (a).—Timber load line for vessels constructed for the carriage of complete cargoes of timber.

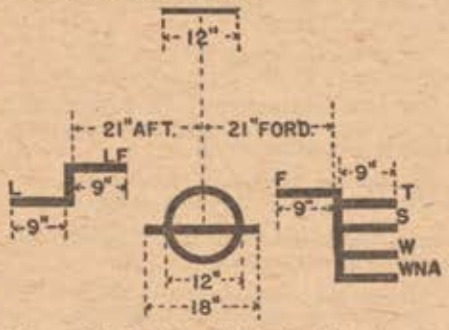


FIGURE 43.35-1 (b).—Timber load line in conjunction with steamer load line for vessels constructed for the carriage of complete cargoes of timber.

(b) Existing vessels which have been specially constructed to carry complete cargoes of timber (the lumber schooner type) and which carry cargoes other than complete timber cargoes, will be marked as provided in § 43.01-15, the marking is illustrated by figure 43.35-1 (b).

(c) The forward mark will be determined as provided in §§ 43.15-1—43.15-97 or §§ 43.20-1—43.20-45, as applicable to the type of vessel dealt with.

Subpart 43.40—Zones and Seasonal Areas and Miscellaneous Requirements

§ 43.40-1 Boundaries of the zones and seasonal areas.

(a) The southern boundary of the northern "winter seasonal" zone is a line drawn from the east coast of North America along the parallel of latitude 36° N. to Tarifa, in Spain; from the east coast of Korea along the parallel of latitude 35° N. to the west coast of Honshu, Japan; from the east coast of Honshu along the parallel of latitude 35° N. to longitude 150° W., and thence along a rhumb line to the west coast of British Columbia at latitude 55° N., Fusan (Korea) and Yokohama to be considered as being on the boundary line of the northern "winter seasonal" zone and the "summer" zone.

(b) The northern boundary of the "tropical" zone is a line drawn from the east coast of South America at lat. 10° N. along the parallel of lat. 10° N. to long. 20° W., thence north to lat. 20° N. and thence along the parallel of lat. 20° N. to the West Coast of Africa; a line from the east coast of Africa along the parallel of lat. 8° N. to the west coast of the Malay Peninsula, following thence the coast of Malay and Siam to the east coast of Cochin China at lat. 10° N., thence along the parallel of lat. 10° N. to long. 145° E., thence north to lat. 13° N. and thence along the parallel of lat. 13° N. to the west coast of Central America, Saigon to be considered as being on the boundary line of the "tropical" zone and the "seasonal tropical" area (4).

(c) The southern boundary of the "tropical" zone is a line drawn from the east coast of South America along the Tropic of Capricorn to the West Coast of Africa; from the east coast of Africa along the parallel of lat. 20° S. to the west coast of Madagascar, thence along the west and north coast of Madagascar to long. 50° E., thence north to lat. 10° S., thence along the parallel of lat. 10° S. to long. 110° E., thence along a rhumb line to Port Darwin, Australia, thence eastward along the coast of Australia and Wessel Island to Cape Wessel, thence along the parallel of lat. 11° S. to the west side of Cape York from the east side of Cape York at lat. 11° S. along the parallel of lat. 11° S. to long. 150° W., thence along a rhumb line to the point lat. 26° S., long. 75° W., and thence along a rhumb line to the west coast of South America at lat. 30° S., Coquimbo, Rio de Janeiro, and Port Darwin to be considered as being on the boundary line of the "tropical" and "summer" zones.

(d) The following regions are to be included in the "tropical" zone:

(1) The Suez Canal, the Red Sea, and the Gulf of Aden, from Port Said to the meridian of 45° E., Aden and Berbera to be considered as being on the boundary line of the "tropical" zone and the "seasonal tropical" area 2 (ii).

(2) The Persian Gulf to the meridian of 59° E.

(e) The northern boundary of the southern "winter seasonal" zone is a line drawn from the east coast of South America along the parallel of latitude 40° S. to longitude 56° W., thence along a rhumb line to the point latitude 34° S., longtitude 50° W., thence along the parallel of latitude 34° S. to the west coast of South Africa; from the east coast of South Africa at latitude 30° S. along a rhumb line to the point latitude 35°30′ S., longitude 118° E., off the southern coast of Australia, thence along a rhumb line to Cape Grim, Tasmania, thence along the north coast of Tasmania to Eddystone Point, thence along a rhumb line to the west coast of South Island, New Zealand, at longitude 170° E., thence along the west, south, and

east coasts of South Island to Cape Saunders, thence along a rhumb line to the point latitude 33° S., longitude 170° W.; and thence along the parallel of latitude 33° S. to the west coast of South America. Valparaiso, Capetown, and Durban to be considered as being on the boundary line of the Southern "seasonal winter" and "summer" zones.

(f) The remaining areas constitute the "summer" zones. The following areas are seasonal tropical areas:

(1) In the North Atlantic Ocean: An area bounded on the north by a line from Capa Catoche in Yucatan to Cape San Antonio in Cuba, by the South Cuban Coast to lat. 20° N. and by the parallel of lat. 20° N. to the point lat. 20° N., long. 20° W., on the west by the coast of Central America; on the south by the north coast of South America and by parallel of lat. 10° N., and on the east by the meridian of 20° W.

Tropical: 1st November to 15th July.
Summer: 16th July to 31st October.

(2) Arabian Sea: (i) North of lat. 24° N. Karachi is to be considered as being on the boundary line of this area and the seasonal tropical area below.

Tropical: 1st August to 20th May.
Summer: 21st May to 31st July.

(ii) South of lat. 24° N.

Tropical: 1st December to 20th May, and 16th September to 15th October.
Summer: 21st May to 15th September and 16th October to 30th November.

(3) Bay of Bengal:

Tropical: 16th December to 15th April.
Summer: 16th April to 15th December.

(4) In the China Sea: An area bounded on the west and north by the coast of Indo-China and China to Hong Kong, on the east by a rhumb line to the port of Sual (Luzon Island), and by the west coast of the Islands of Luzon, Samar, and Leyte to the parallel of 10° N., and on the south by the parallel of lat. 10° N., Hong Kong and Sual to be considered as being on the boundary of the "seasonal tropical" and "summer" zones.

Tropical: 21st January to 30th April.
Summer: 1st May to 20th January.

(5) In the north Pacific Ocean: (i) An area bounded on the north by the parallel of lat. 25° N., on the west by the meridian of 160° E., on the south by the parallel of lat. 13° N., and on the east by the meridian of 130° W.

Tropical: 1st April to 31st October.
Summer: 1st November to 31st March.

(ii) An area bounded on the north and east by the coast of California, Mexico, and Central America, on the west by the meridian of 120° W., and by a rhumb line from the point lat. 30° N., long. 120° W., to the point lat. 13° N., long. 105° W., and on the south by the parallel of lat. 13° N.

Tropical: 1st March to 30th June and 1st to 30th November.
Summer: 1st July to 31st October and 1st December to 28th/29th February.

(6) In the south Pacific Ocean: (i) An area bounded on the north by the parallel of lat. 11° S., on the west by the east coast of Australia, on the south by the parallel of lat. 20° S., and on the east by the meridian of 175° E., together with the Gulf of Carpentaria south of lat. 11° S. Mackay is to be considered as being on the boundary of the "seasonal tropical" and the "summer" zones.

Tropical: 1st April to 30th November.
Summer: 1st December to 31st March.

(ii) An area bounded on the west by the meridian of 150° W., on the south by the parallel of lat. 20° S., and on the north and east by the rhumb line forming the southern boundary of the tropical zone.

Tropical: 1st March to 30th November.
Summer: 1st December to 28/29th February.

(g) The following are seasonal winter areas: (1) Northern seasonal winter zone (between North America and Europe). (i) In the area within and to the northwards of the following line: A line drawn south from the coast of Greenland at long. 50° W. to lat. 45° N., thence along the parallel of lat. 45° N. to the meridian of 15° W., thence north to lat. 60° N., thence along the parallel of lat. 60° N. to the west coast of Norway, Bergen to be considered as being on the boundary line of this area and area subdivision (ii) of this subparagraph.

Winter: 16th October to 15th April.
Summer: 16th April to 15th October.

(ii) An area outside area subdivision (i) of this subparagraph and north of the parallel of lat. 36° N.

Winter: 1st November to 31st March.
Summer: 1st April to 31st October.

(2) Baltic (bounded by the parallel of latitude of the Skaw).

Winter: 1st November to 31st March.
Summer: 1st April to 31st October.

(3) Mediterranean and Black Sea.

Winter: 16th December to 15th March.
Summer: 16th March to 15th December.

(4) Northern "seasonal winter" zone (between Asia and North America, except Sea of Japan), south of 50° N.

Winter: 16th October to 15th April.
Summer: 16th April to 15th October.

(5) Sea of Japan between the parallels of lat. 35° N. and 50° N.

Winter: 1st December to 28th/29th February.
Summer: 1st March to 30th November.

(6) Southern "seasonal winter" zone.

Winter: 16th April to 15th October.
Summer: 16th October to 15th April.

§ 43.40–5 Fees, travel expense.

(a) *Scale of fees.* (1) Subject to the conditions as set forth in this paragraph, fees payable by owners will be charged for assignment of load line (including load line and condition survey, verification of markings and issuance of load line certificates) in accordance with Table 43.40–5 (a).

TABLE 43.40–5 (a)—FEES FOR ASSIGNMENT OF LOAD LINE

Size of vessel	Classed vessel [1]	Unclassed vessels
Under 200 gross tons	$30.00	$100.00
200 and under 400 gross tons	30.00	123.00
400 and under 700 gross tons	35.00	155.00
700 and under 1,000 gross tons	40.00	190.00
1,000 and under 1,500 gross tons	40.00	230.00
1,500 and under 2,500 gross tons	50.00	270.00
2,500 and under 3,500 gross tons	60.00	310.00
3,500 and under 5,000 gross tons	70.00	350.00
5,000 and under 6,500 gross tons	85.00	390.00
6,500 and under 8,000 gross tons	100.00	430.00
8,000 and under 10,000 gross tons	110.00	470.00
10,000 and under 12,000 gross tons	120.00	510.00
12,000 and under 15,000 gross tons	130.00	550.00
15,000 gross tons and above	140.00	590.00

[1] Classed vessel means vessel in class with the assigning authority.

(2) In the case of unclassed vessels newly built, where an extensive review of construction plans and attendance during construction by the Surveyors of the assigning authority may be required, in the case of existing unclassed vessels where necessary plans are not available, and in cases where alterations or repairs are made, which would require more than a normal attendance by the Surveyors, additional fees proportional to the amount of work involved may be charged.

(3) The provisions of this paragraph may be applied to either classed or unclassed vessels in cases where, due to alterations or changes in service, a new freeboard may be required.

(b) *Fees for renewal of load line certificates.* (1) For unclassed vessels the fees for condition survey and renewal of load line certificates shall be 50 percent of the scale in paragraph (a) of this section. In cases where alterations or repairs are made which would require more than a normal attendance by the Surveyors, additional fees, proportional to the amount of work involved may be charged.

(2) For classed vessels where the survey is carried out in conjunction with a survey required for maintenance of class and for which a fee is chargeable, no charge will be made for the survey, but an amount not exceeding $25 for the issuance of the new load line certificate may be charged.

(c) *Fees for annual load line inspection.* The fee for annual load line inspection shall be $25 for vessels not exceeding 2,000 gross tons, and $35 for vessels of more than 2,000 gross tons. Where alterations or repairs are made, which would require more than a normal attendance by the Surveyors, additional fees proportional to the work involved may be charged. In the case of a classed vessel no charge will be made for this inspection if carried out at the same time as a survey to the hull that is required for maintenance of class and for which a fee is chargeable.

(d) *Traveling expenses.* For all traveling expenses incurred in connection with the surveys described in this section there will be an additional charge.

§ 43.40–10 Forms of load line certificates.

INTERNATIONAL LOAD LINE CERTIFICATE

[FORM A1]

Issued under the authority of the United States of America, Commandant, U. S. Coast Guard, under the provisions of the International Load Line Convention, 1930.

[SEAL]
Issued by _____
Certificate No. _____
Name of ship _____ Official No. _____
Port of registry _____ Gross tonnage _____

FREEBOARD FROM DECK LINE		LOAD LINE
Tropical	(T)	_____ Above (S)
Summer	(S)	Upper edge of line through center of disk.
Winter	(W)	_____ Below (S)
Winter (North Atlantic)	(WNA)	_____ Below (S)

*Allowance for fresh water for all freeboards _____

(All measurements are to upper edges of the respective horizontal lines)

The upper edge of the deck line from which these freeboards are measured is _____ inches above the top of the* _____ deck at side.



This is to certify that this ship has been surveyed and the freeboards and load lines shown above have been assigned in accordance with the Convention.

**This certificate remains in force until _____ issued at _____ on the _____ day of _____, 19____.

(Here follows the signature or seal and description of the assigning authority.)

NOTES: (1) In accordance with the Load Line Regulations, the disk and lines must be permanently marked by center punch marks or cutting. Letters indicating the assigning authority are to be marked alongside the disk and above the center line. Periodic inspections are to be made at intervals of approximately twelve months.

*Where seagoing steamers navigate a river or inland water, deeper loading is permitted corresponding to the weight of fuel, etc., required for consumption between the point of departure and the open sea.

**At the expiration of this certificate, renewal should be obtained in accordance with the Load Line Regulations and if upon examination the ship is found to be in a satisfactory condition, this certificate will be extended and so endorsed on the reverse side.

(2) The load line assignment given by this certificate necessarily assumes that the nature and stowage of cargo, ballast, etc., are such as to secure sufficient stability for the vessel. Accordingly, it is the owner's responsibility to furnish the Master of the vessel with stability information and instructions when this is necessary to maintenance of sufficient stability.

(On the reverse side of the load line certificate or on a separate sheet attached and forming part of the certificate, provision is to be made for annual inspection and renewal endorsements.)

(Reverse side of certificate)

ANNUAL INSPECTIONS

I have surveyed this ship for the purpose of seeing whether this certificate should remain in force and the survey has been completed to my satisfaction.

_____ _____ _____
(Signature of Surveyor) (Place) (Date)

I have surveyed this ship for the purpose of seeing whether this certificate should remain in force and the survey has been completed to my satisfaction.

_____ _____ _____
(Signature of Surveyor) (Place) (Date)

I have surveyed this ship for the purpose of seeing whether this certificate should remain in force and the survey has been completed to my satisfaction.

_____ _____ _____
(Signature of Surveyor) (Place) (Date)

I have surveyed this ship for the purpose of seeing whether this certificate should remain in force and the survey has been completed to my satisfaction.

_____ _____ _____
(Signature of Surveyor) (Place) (Date)

RENEWAL OF LOAD LINE CERTIFICATE

The provisions of the Convention being fully complied with by this ship, this certificate is renewed until _____, 19___.
Place _____
Date _____

ASSIGNING AUTHORITY
By _____
(Surveyor)

NOTES

1. The Winter North Atlantic Load Line applies for voyages across the North Atlantic Ocean north of latitude 36° N., during the winter months as defined by the Load Line Regulations. The periods during which the other seasonal load lines apply in different parts of the world are as stated in the Load Line Regulations.

2. This Load Line Certificate will be canceled by the Commandant, U. S. Coast Guard, if—

(a) The periodic inspections have not been carried out.

(b) Material alterations have been made to the hull or superstructures which would affect the calculations determining the position of the load lines.

(c) The fittings and appliances for the protection of the openings, guardrails, freeing ports, or the means of access to the crew's quarters have not been maintained in as effective a condition as they were when the Certificate was issued.

3. When this Certificate has expired or been canceled, it must be delivered to the Assigning Authority.

APPLIANCES FOR CLOSING ACCESS OPENINGS IN BULKHEADS AT ENDS OF DETACHED SUPERSTRUCTURES

Forecastle _____
Bridge, fore end _____
Bridge, after end _____
Poop _____

TEMPORARY APPLIANCES FOR CLOSING OPENINGS IN SUPERSTRUCTURE DECKS

_____
_____

INTERNATIONAL LOAD LINE CERTIFICATE

[Form A2]

Issued under the authority of the United States of America, Commandant, U. S. Coast Guard, under the provisions of the International Load Line Convention, 1930.

[SEAL]

Issued by _____
Certificate No. _____
Name of ship _____ Official No. _____
Port of registry _____ Gross tonnage _____

FREEBOARD FROM DECK LINE		LOAD LINE
Tropical, Summer, Winter		Upper edge of line through center of disk.
Winter—North Atlantic	(WNA)	Upper edge of line below center of disk.

Allowance for fresh water for all freeboards _____

(All measurements are to upper edges of the respective horizontal lines)

The upper edge of the deck line from which these freeboards are measured is _____ inches above the top of the _____ deck at side.



This is to certify that this ship has been surveyed and the freeboards and load lines shown above have been assigned in accordance with the Convention.

*This certificate remains in force until _____
Issued at _____ on the _____ day of _____, 19___

(Here follows the signature or seal and description of the assigning authority.)

NOTES: (1) In accordance with the Load Line Regulations, the disk and lines must be permanently marked by center punch marks or cutting. Letters indicating the assigning authority are to be marked alongside the disk and above the centerline. Periodic inspections are to be made at intervals of approximately twelve months.

(2) The load line assignment given by this certificate necessarily assumes that the nature and stowage of cargo, ballast, etc., are such as to secure sufficient stability for the vessel. Accordingly, it is the owner's responsibility to furnish the Master of the vessel with stability information and instructions when this is necessary to maintenance of sufficient stability.

(On the reverse side of the load line certificate, or on a separate sheet attached and forming part of the certificate, provision is to be made for annual inspection and renewal endorsements.)

(Reverse side of certificate to be prepared with notes and for endorsements as set forth for Form A1.)

*At the expiration of this certificate, renewal should be obtained in accordance with the Load Line Regulations and if upon examination the ship is found to be in a satisfactory condition, this certificate will be extended and so endorsed on the reverse side.

INTERNATIONAL LOAD LINE CERTIFICATE

[Form A3]

Issued under the authority of the United States of America, Commandant, U. S. Coast Guard, under the provisions of the International Load Line Convention, 1930.

[SEAL]

Issued by _____
Certificate No. _____
Name of ship _____ Official No. _____
Port of registry _____ Gross tonnage _____

FREEBOARDS FROM DECK LINE		LOAD LINE
Tropical	(T)	_____ Above (S)
Summer	(S)	Upper edge of line through center of disk.
Winter	(W)	_____ Below (S)
Winter (North Atlantic)	(WNA)	_____ Below (S)

*Allowance for fresh water for all freeboards _____

The timber freeboards given in this certificate are applicable only when this ship carries a timber deck cargo and complies with the special requirements of the Load Line Regulations regarding timber deck cargoes.

FREEBOARDS FROM DECK LINE		LOAD LINE
Tropical (Timber)	(LT)	_____ Above (S)
Summer (Timber)	(LS)	_____ Above (S)
Winter (Timber)	(LW)	_____ Above (S)
Winter North Atlantic (Timber)	(LWNA)	_____ Below (S)

(All measurements are to upper edges of the respective horizontal line)

The upper edge of the deck line from which these freeboards are measured is _____ inches above the top of the _____ deck at side.



This is to certify that this ship has been surveyed and the freeboards and load lines shown above have been assigned in accordance with the Convention.

LOAD LINE REGULATIONS

**This certificate remains in force until _____
Issued at _____ on the _____ day of _____, 19___

(Here follows the signature or seal and description of the assigning authority.)

*Where seagoing steamers navigate a river or inland water, deeper loading is permitted corresponding to the weight of fuel, etc., required for consumption between the point of departure and the open sea.

**At the expiration of this certificate, renewal should be obtained in accordance with the Load Line Regulations and if upon examination the ship is found to be in a satisfactory condition, this certificate will be extended and so indorsed on the reverse side.

NOTES: (1) In accordance with the Load Line Regulations, the disk and lines must be permanently marked by center punch marks or cutting. (The diagram showing the timber load line marks is to be inserted above by the assigning authority.) Letters indicating the assigning authority are to be marked alongside the disk and above the center line. Periodic inspections are to be made at intervals of approximately twelve months.

(2) The load line assignment given by this certificate necessarily assumes that the nature and stowage of cargo, ballast, etc., are such as to secure sufficient stability for the vessel. Accordingly, it is the owner's responsibility to furnish the Master of the vessel with stability information and instructions when this is necessary to maintenance of sufficient stability.

(On the reverse side of the load line certificate, or on a separate sheet attached and forming part of the certificate, provision is to be made for annual inspection and renewal endorsements.)

(Reverse side of certificate to be prepared with notes and for endorsements as set forth for Form A1.)

LOAD LINE CERTIFICATE

[Form B]

(To be issued to foreign vessels belonging to countries that have not ratified or acceded to the International Load Line Convention, 1930.)

Issued under the authority of the United States of America, Commandant, U. S. Coast Guard, under the provisions of the Load Line Act of March 2, 1929, as amended.

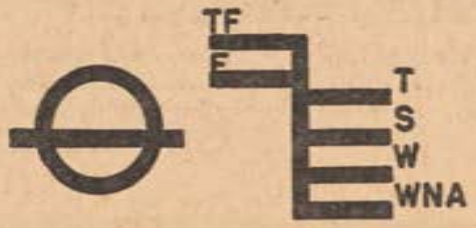
[SEAL]

Issued by _____
Certificate No. _____
Name of ship _____ Official No. _____
Port of registry _____ Gross tonnage _____

FREEBOARD FROM DECK LINE		LOAD LINE
Summer in tropical seas	(T)	_____ Above (S)
Summer	(S)	Upper edge of line through center of disk.
Winter	(W)	_____ Below (S)
Winter in North Atlantic	(WNA)	_____ Below (S)

*Allowance for fresh water for all freeboards _____

The upper edge of the deck line from which these freeboards are measured is _____ inches above the top of the _____ deck at side.



*Where seagoing steamers navigate a river or inland water, deeper loading is permitted corresponding to the weight of fuel, etc., required for consumption between the point of departure and the open sea.

This is to certify that this ship has been surveyed and the freeboards and load lines shown above have been found to be correctly marked upon the vessel in manner and location as provided by the load line regulations of the Commandant, U. S. Coast Guard.

**This certificate remains in force until _____
Issued at _____ on the _____ day of _____, 19__

(Here follows the signatures or seal and the description of the authority issuing the certificate.)

NOTES: (1) In accordance with the Load Line Regulations, the disk and lines must be permanently marked by center punch marks or cutting. Letters indicating the assigning authority are to be marked alongside the disk and above the centerlines. This certificate is limited to 1 year and must be renewed annually.

(2) The load line assignment given by this certificate necessarily assumes that the nature and stowage of cargo, ballast, etc., are such as to secure sufficient stability for the vessel. Accordingly, it is the owner's responsibility to furnish the Master of the vessel with stability information and instructions when this is necessary to maintenance of sufficient stability.

(On the reverse side of the load line certificate, or on a separate sheet attached and forming part of the certificate, provision is to be made for renewal endorsements.)

(Reverse side of certificate)

RENEWAL OF LOAD LINE CERTIFICATE

The provisions of the regulations of the Commandant, U. S. Coast Guard, determining load lines being fully complied with by this ship, this certificate is renewed till _____ Place_____ Date_____

Signature or seal and description of assigning authority.

The provisions of the regulations of the Commandant, U. S. Coast Guard, determining load lines being fully complied with by this ship, this certificate is renewed till _____ Place_____ Date_____

Signature or seal and description of assigning authority.

NOTES

1. The Winter North Atlantic Load Line applies for voyages across the North Atlantic Ocean north of latitude 36° N., during the winter months as defined by the Load Line Regulations. The periods during which the other seasonal load lines apply in different parts of the world are as stated in the Load Line Regulations.

2. This Load Line Certificate will be canceled by the Commandant, U. S. Coast Guard if—

(a) Material alterations have been made to the hull or superstructure which would affect the calculations determining the position of the load lines.

(b) The fittings and appliances for the protection of the openings, guardrails, freeing ports, or the means of access to the crew's quarters have not been maintained in as effective a condition as they were when the Certificate was issued.

3. When this Certificate has expired or been canceled, it must be delivered to the Assigning Authority.

APPLIANCES FOR CLOSING ACCESS OPENINGS IN BULKHEADS AT ENDS OF DETACHED SUPERSTRUCTURES

Forecastle _____
Bridge, fore end _____
Bridge, after end _____
Poop _____

TEMPORARY APPLIANCES FOR CLOSING OPENINGS IN SUPERSTRUCTURE DECKS

_____
_____

**At the expiration of the certificate, renewal should be obtained in accordance with the Load Line Regulations and if upon examination the ship is found to be in a satisfactory condition, this certificate will be extended and so endorsed on the reverse side.

COASTWISE LOAD LINE CERTIFICATE

[Form C1]

Issued under the authority of the United States of America, Commandant, U. S. Coast Guard, under the provisions of the Coastwise Load Line Act, 1935, as amended.

[SEAL]

Issued by _____
Certificate No. _____
Name of ship _____ Official No. _____
Port of registry _____ Gross tonnage _____

FREEBOARD FROM DECK LINE		LOAD LINE
Tropical _____	(T)	_____ Above (S)
Summer _____	(S)	Upper edge of line through center of disk.
Winter _____	(W)	_____ Below (S)

*Allowance for fresh water for all freeboards _____

(All measurements are to upper edges of the respective horizontal lines.)

The upper edge of the deck line from which these freeboards are measured is _____ inches above the top of the _____ deck at side.

This is to certify that this ship has been surveyed and the freeboards and load lines shown above have been assigned in accordance with the Commandant, U. S. Coast Guard, Coastwise Load Line Regulations.

**This certificate remains in force until _____
Issued at _____ on the _____ day of _____, 19...

(Here follows the signature or seal and description of the assigning authority.)



NOTES: (1) In accordance with the Load Line Regulations, the disk and lines must be permanently marked by center punch marks or cutting. Letters indicating the assigning authority are to be marked alongside the disk and above the center line. Periodic inspections are to be made at intervals of approximately twelve months.

(2) The load line assignment given by this certificate necessarily assumes that the nature and stowage of cargo, ballast, etc., are such as to secure sufficient stability for the vessel. Accordingly, it is the owner's responsibility to furnish the Master of the vessel with stability information and instructions when this is necessary to maintenance of sufficient stability.

(On the reverse side of the load line certificate, or on a separate sheet attached and forming part of the certificate, provision is to be made for annual inspection and renewal endorsements.)

*Where seagoing steamers navigate a river or inland water, deeper loading is permitted corresponding to the weight of fuel, etc., required for consumption between the point of departure and the open sea.

**At the expiration of the certificate, renewal should be obtained in accordance with the Load Line Regulations and if upon examination the ship is found to be in a satisfactory condition, this certificate will be extended and so endorsed on the reverse side.

(Reverse side of certificate)

ANNUAL INSPECTION

I have surveyed this ship for the purpose of seeing whether this certificate should remain in force and the survey has been completed to my satisfaction.

_____ _____ _____
(Signature of Surveyor) (Place) (Date)

I have surveyed this ship for the purpose of seeing whether this certificate should remain in force and the survey has been completed to my satisfaction.

_____ _____ _____
(Signature of Surveyor) (Place) (Date)

I have surveyed this ship for the purpose of seeing whether this certificate should remain in force and the survey has been completed to my satisfaction.

_____ _____ _____
(Signature of Surveyor) (Place) (Date)

I have surveyed this ship for the purpose of seeing whether this certificate should remain in force and the survey has been completed to my satisfaction.

_____ _____ _____
(Signature of Surveyor) (Place) (Date)

RENEWAL OF LOAD LINE CERTIFICATE

The provisions of the Coastwise Load Line Regulations of the Commandant, U. S. Coast Guard, being fully complied with by this ship, this certificate is renewed until _____, 19...

Place _____
Date _____

Assigning Authority
By _____
(Surveyor)

NOTES

1. The periods and areas during which the seasonal load lines apply are as stated in the Load Line Regulations.

2. This Load Line Certificate will be canceled by the Commandant, U. S. Coast Guard, if—

(a) The periodic inspections have not been carried out.

(b) Material alterations have been made to the hull or superstructures which would affect the calculations determining the position of the load lines.

(c) The fittings and appliances for the protection of the openings, guard rails, freeing ports, or the means of access to the crew's quarters have not been maintained in as effective a condition as they were when the Certificate was issued.

3. When this certificate has expired or been canceled, it must be delivered to the Assigning Authority.

APPLIANCES FOR CLOSING ACCESS OPENINGS IN BULKHEADS AT ENDS OF DETACHED SUPERSTRUCTURES

Forecastle _____
Bridge, fore end _____
Bridge, after end _____
Poop _____

TEMPORARY APPLIANCES FOR CLOSING OPENINGS IN SUPERSTRUCTURE DECKS

_____
_____

COASTWISE LOAD LINE CERTIFICATE

[Form C2]

Issued under the authority of the United States of America, Commandant, U. S. Coast Guard, under the provisions of the Coastwise Load Line Act, 1935, as amended.

[SEAL]

Issued by _____

Certificate No. _____

Name of ship _____ Official No. _____

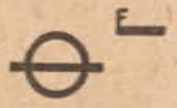
Port of registry _____ Gross tonnage _____

FREEBOARD FROM DECK LINE	LOAD LINE
Tropical Summer Winter _____	Upper edge of line through center of disk.

Allowance for fresh water for all freeboards _____

(All measurements are to upper edges of the respective horizontal lines.)

The upper edge of the deck line from which these freeboards are measured is _____ inches above the top of the _____ deck at side.



This is to certify that this ship has been surveyed and the freeboards and load lines shown above have been assigned in accordance with the Commandant, U. S. Coast Guard, Coastwise Load Line Regulations.

*This certificate remains in force until _____

Issued at _____ on the _____ day of _____, 19__.

(Here follows the signature or seal and description of the assigning authority.)

NOTES: (1) In accordance with the Load Line Regulations, the disk and lines must be permanently marked by center punch marks or cutting. Letters indicating the assigning authority are to be marked alongside the disk and above the centerline. Periodic inspections are to be made at intervals of approximately twelve months.

(2) The load line assignment given by this certificate necessarily assumes that the nature and stowage of cargo, ballast, etc., are such as to secure sufficient stability for the vessel. Accordingly, it is the owner's responsibility to furnish the Master of the vessel with stability information and instructions when this is necessary to maintenance of sufficient stability.

(On the reverse side of the load line certificate, or on a separate sheet attached and forming part of the certificate, provision is to be made for annual inspection and renewal endorsements.)

(Reverse side of certificate to be prepared with notes and for endorsements as set forth for Form C1.)

*At the expiration of this certificate, renewal should be obtained in accordance with the Load Line Regulations and if upon examination the ship is found to be in a satisfactory condition, this certificate will be extended and so indorsed on the reverse side.

COASTWISE LOAD LINE CERTIFICATE

[Form C3]

Issued under the authority of the United States of America, Commandant, U. S. Coast Guard, under the provisions of the Coastwise Load Line Act, 1935, as amended.

[SEAL]

Issued by _____

Certificate No. _____

Name of ship _____ Official No. _____

Port of registry _____ Gross tonnage _____

FREEBOARD FROM DECK LINE		LOAD LINE
Tropical	(T)	_____ Above (S)
Summer	(S)	Upper edge of line through center of disk.
Winter	(W)	_____ Below (S)

*Allowance for fresh water for all freeboards _____

The timber freeboards given in this certificate are applicable only when this ship carries a timber deck cargo and complies with the special requirements of the Load Line Regulations regarding timber deck cargoes.

FREEBOARDS FROM DECK LINE		LOAD LINE
Tropical (Timber)	(LT)	_____ Above (S)
Summer (Timber)	(LS)	_____ Above (S)
Winter (Timber)	(LW)	_____ Above (S) Below (S)

(All measurements are to upper edges of the respective horizontal lines.)

The upper edge of the deck line from which these freeboards are measured is _____ inches above the top of the _____ deck at side.



This is to certify that this ship has been surveyed and the freeboards and load lines shown above have been assigned in accordance with the Commandant, U. S. Coast Guard, Coastwise Load Line Regulations.

**This certificate remains in force until _____

Issued at _____ on the _____ day of _____, 19__.

(Here follows the signature or seal and description of the assigning authority.)

NOTES: (1) In accordance with the Load Line Regulations, the disk and lines must be permanently marked by center punch marks or cutting. (The diagram showing the timber load line marks is to be inserted above by the assigning authority.) Letters indicating the assigning authority are to be marked alongside the disk and above the centerline. Periodic inspections are to be made at intervals of approximately twelve months.

*Where seagoing steamers navigate a river or inland water, deeper loading is permitted corresponding to the weight of fuel, etc., required for consumption between the point of departure and the open sea.

**At the expiration of this certificate, renewal should be obtained in accordance with the Load Line Regulations and if upon examination the ship is found to be in a satisfactory condition, this certificate will be extended and so endorsed on the reverse side.

(2) The load line assignment given by this certificate necessarily assumes that the nature and stowage of cargo, ballast, etc., are such as to secure sufficient stability for the vessel. Accordingly, it is the owner's responsibility to furnish the Master of the vessel with stability information and instructions when this is necessary to maintenance of sufficient stability.

(On the reverse side of the load line certificate, or on a separate sheet attached and forming part of the certificate, provision is to be made for annual inspection and renewal endorsements.)

(Reverse side of certificate to be prepared with notes and for endorsements as set forth for Form C1.)

COASTWISE LOAD LINE CERTIFICATE

[Form C4; applicable to vessels assigned freeboards on the basis of 46 CFR 43.15–87, 43.15–90, 43.15–98, and/or 43.30–75]

Issued under authority of the United States of America, Commandant, U.S. Coast Guard, under the provisions of the Coastwise Load Line Act, 1935, as amended.

This Certificate is valid only for vessels on United States' coastwise and/or intercoastal voyages.

[SEAL]

Issued by _____

Certificate No. _____

Name of ship _____ Official No. _____

Port of registry _____ Gross tonnage _____

FREEBOARD FROM DECK LINE		LOAD LINE
Tropical _____	(T)	Above upper edge of line through center of disk.
Summer _____	(S)	Above upper edge of line through center of disk.
Winter _____	(W)	Below upper edge of line through center of disk.

*Allowance for fresh water for all freeboards _____

(All measurements are to upper edges of the respective horizontal lines.)

The upper edge of the deck line from which these freeboards are measured is _____ inches above the top of the _____ deck at side.



This is to certify that this ship has been surveyed and the freeboards and load lines shown above have been assigned in accordance with the Commandant, U.S. Coast Guard, Coastwise Load Line Regulations.

**This certificate remains in force until _____

Issued at _____ on the _____ day of _____, 19__.

(Here follows the signature or seal and description of the assigning authority.)

NOTES: (1) In accordance with the Load Line Regulations, the disk and lines must be permanently marked by center punch marks or cutting. Letters indicating the assigning authority are to be marked alongside the disk and above the centerline. Periodic inspections are to be made at intervals of approximately twelve months.

(2) The load line assignment given by this certificate necessarily assumes that the nature and stowage of cargo, ballast, etc., are such as to secure sufficient stability for the vessel. Accordingly, it is the owner's responsibility to furnish the Master of the vessel with stability information and instructions when this is necessary to maintenance of sufficient stability.

(On the reverse side of the load line certificate, or on a separate sheet attached and forming part of the certificate, provision is to be made for annual inspection and renewal endorsements.)

(Reverse side of certificate to be prepared with notes and for endorsements as set forth for Form C1.)

*Where seagoing steamers navigate a river or inland waters, deeper loading is permitted corresponding to the weight of fuel, etc., required for consumption between the point of departure and the open sea.

**At the expiration of the certificate, renewal should be obtained in accordance with the Load Line Regulations, and if upon examination the ship is found to be in satisfactory condition, this certificate will be extended and so endorsed on the reverse side.

§ 43.40–15 Titles of load line laws and rules regarded as equivalent to the British Board of Trade Rules, 1906.

(a) *Australia.* Part IV of the Navigation Act, 1912–1920, and Navigation (Load Line) Regulations of the 17th December 1924.

(b) *Belgium.* Loi sur la sécurité des navires (7 décembre 1920).

(c) *Chile.* Reglamento para el trazato del disco marcas y linea oficial de carguio de las naves mercantes (Decree No. 1892 of the 12th November 1919).

(d) *Denmark.* Merchant Shipping (inspection of ships) Act of the 29th March 1920, with later amendments.

Rule and Tables of Freeboard for Ships, dated the 30th September 1909, as amended by notification of the 25th July 1918.

(e) *France.* Loi du 17 avril 1907, arrêté du 5 septembre 1908. Décret du 21 septembre 1908. Autre décret du 21 septembre 1908, modifié par le décret du 1 septembre 1925. Décret du 12 mai 1927. Décret du 17 janvier 1928.

(f) *Germany.* Vorschriften der See-Berufsgenossenschaft über den Freibord für Dampfer und Segelschiffe, Ausgabe 1908.

(g) *Hong Kong.* Merchant shipping consolidation ordinance (No. 10 of 1899), as amended by ordinances Nos. 31 of 1901, 2 of 1903, 5 of 1905, 16 of 1906, 9 of 1909, and 6 of 1910.

(h) *Iceland.* Law No. 58 of the 14th June, 1929, sections 25–26.

(i) *India.* Indian Merchant Shipping Act, 1923.

(j) *Italy.* Regole e tavole per assignazione del "Bordo Libero", approved by decree dated the 1st February 1929—VII of the Italian Minister for Communications.

Prior to 1929—British Board of Trade Rules, 1906.

(k) *Japan.* Ship load line law [Law No. 2 of the 10th year of Taisho (1921)] and the rules and regulations relating thereto.

(l) *Netherlands.* Decree of the 22d September 1909 (Official Journal No. 315).

(m) *Netherland Indies.* Netherlands decree of the 22d September 1909 (Official Journal No. 315).

(n) *New Zealand.* British Board of Trade Rules, 1906.

(o) *Norway.* Norwegian Freeboard Rules and Tables of 1909.

(p) *Portugal.* Decree No. 11,210 of the 18th July 1925, and regulations and instructions relating thereto.

(q) *Spain.* Reglamento para el Trazado del Disco y Marcas de Maxima Carga de los buques marchantes, 1914.

(r) *Straits Settlements.* British Board of Trade Rules, 1906.

(s) *Sweden.* Rules and Tables of Freeboard approved by decree of the 21st May 1910.

(t) *United Kingdom.* Board of Trade Rules, 1906.

(u) *Union of Soviet Socialist Republics.* Rules and Regulations relating to the Load Lines of Seagoing Merchant Vessels, published by Register of the Union of Soviet Socialist Republics, 1928.

PART 44—VARIANCE FOR STEAM COLLIERS, BARGES, AND SELF-PROPELLED BARGES (WHEN ENGAGED IN SPECIAL SERVICES ON COASTWISE AND INTER-ISLAND VOYAGES)

Subpart 44.01—Administration

Sec.
44.01–1 Establishment of load lines for special services.
44.01–5 Administration; special service.
44.01–10 Approval by Commandant, U. S. Coast Guard, of special service.
44.01–11 Assignment and marking load lines; special service.
44.01–12 Voyage limits; special service.
44.01–15 Special service certificate.
44.01–20 New and existing vessels; special service.

Subpart 44.05—Rules of Assignment; Special Service

44.05–1 General.
44.05–5 Definitions.
44.05–10 Load line markings.
44.05–15 Existing vessels.
44.05–20 Conditions of assignment.
44.05–25 Freeboards.
44.05–30 Load line certificate.
44.05–35 Form of load line certificate.

AUTHORITY: The provisions of this Part 44 issued under sec. 2, 49 Stat. 888, as amended; 46 U.S.C. 88a. Treasury Department Orders 120, July 31, 1950, 15 F.R. 6521; 167–48, October 19, 1962, 27 F.R. 10504.

Subpart 44.01—Administration

§ 44.01–1 Establishment of load lines for special services.

(a) Load lines are established for steam colliers, tugs, barges, and self-propelled barges engaged in special services in conformity with the Coastwise Load Line Act, 1935, as amended (46 U.S.C. 88–88i).

(b) Load lines for steam colliers, barges, and self-propelled barges engaged on specially limited coastwise voyages as described in § 44.01–12 shall be established pursuant to the regulations in this part.

(c) Variance for tugs is not permitted.

§ 44.01–5 Administration; special service.

(a) The administrative provisions of §§ 43.01–1—43.01–100 of this subchapter, relating to vessels engaged in foreign and coastwise voyages, where applicable, shall apply to vessels subject to this part except as modified in paragraph (b) of this section.

(b) Application for the assignment of load lines under this part for the types of vessels described in § 44.01–1 shall be made in writing to the American Bureau of Shipping unless another society has been specifically approved by the Commandant as a load line assigning authority. In the latter case application shall be made to the society so approved. Applications shall state the following information:

(1) Name of vessel and official number.
(2) Type of vessel (steam collier, barge, or self-propelled barge).
(3) Date keel was laid.
(4) Normal sea speed of vessel.
(5) Limits of voyage for which approval is requested.
(6) Normal maximum distance offshore in course of voyage.
(7) Length of voyage in days and nautical miles.
(8) Statement of weather conditions to be expected.
(9) Cargo to be carried.
(10) Whether vessel is to be operated manned or unmanned.

§ 44.01–10 Approval by Commandant, U.S. Coast Guard, of special service.

(a) Subject to the conditions contained in this part, the Commandant, U.S. Coast Guard, has determined that load lines at variance from the position fixed by the International Load Line Treaty, 1930, but not above the actual line of safety, may be assigned steam colliers, barges, or self-propelled barges (separately by class) for certain specifically limited coastwise voyages between ports of the continental United States or between islands of a group over which the United States has jurisdiction.

§ 44.01–11 Assignment and marking load lines; special service.

(a) The assignment and marking of special service load lines and certifications thereof shall be in accordance with this part to the satisfaction of the American Bureau of Shipping. The load line certificate shall define the voyage limits and seasonal restrictions governing the validity of the load lines.

§ 44.01–12 Voyage limits; special service.

(a) Special service load lines may be assigned for operation not more than a specified limited distance offshore which shall not exceed 20 nautical miles. The offshore distance shall be measured from the coastline except where a line of inland waters has been otherwise established.

(b) For continental United States ports, special service load lines may be issued for operation between but not to exceed the extreme port limits specified below, or for operation between intermediate ports within the extreme limits specified:

(1) Central and Northern Atlantic Coast—From Norfolk, Virginia, to Eastport, Maine.

(2) Southeast Atlantic Coast—From Key West, Florida, to Jacksonville, Florida, except that the special service load line shall not be valid for manned vessels during the hurricane season, i.e., July 1st to November 15th, both dates inclusive.

(3) Gulf of Mexico Coast—From the mouth of the Rio Grande River, Texas, to Key West, Florida, except that the special service load line shall not be valid for manned vessels during the hurricane season, i.e., July 1st to November 15th, both dates inclusive.

(4) Pacific Coast—From San Francisco, California, to San Diego, California.

(c) Assignment of special service load lines for voyage limits between the islands of a group over which the United States has jurisdiction shall be made only upon authorization by the Commandant, U.S. Coast Guard, after submittal to him of the information called for by § 44.01–5 (b).

§ 44.01–15 Special service certificate.

(a) The use of the special service load line certificate issued under this part is limited to voyages only as described in the certificate. If the vessel engages on any voyage not contemplated by the certificate where a load line is required, the load line prescribed by Part 43 of this subchapter shall govern.

(b) Vessels engaged on special services in the coastwise trade and the inter-island trade will be certificated on the form shown in § 44.05–35.

§ 44.01–20 New and existing vessels; special service.

(a) A new vessel marked with load lines for special service on a coastwise or inter-island voyage is a vessel whose keel was laid on or after September 28, 1937. An existing vessel is one whose keel was laid before that date.

Subpart 44.05—Rules of Assignment; Special Service

§ 44.05–1 General.

(a) The load line regulations in this part are complementary to those in Part 43 or Part 45 (Great Lakes load line regulations) of this subchapter, as reference is made thereto.

§ 44.05–5 Definitions.

(a) A steam collier is a vessel mechanically propelled, and specially designed for the carriage of coal in bulk.

(b) A towed barge is a vessel without sufficient means for self-propulsion and which requires to be towed.

(c) A self-propelled barge is a vessel mechanically propelled of the type specially designed for use in limited coastwise and Great Lakes service and capable of transiting interconnecting canals.

§ 44.05–10 Load line markings.

(a) The load line marks on the vessel's sides are to be in accordance with § 43.05–15 of this subchapter, figure 43.05–5(a). Seasonal markings such as "Winter North Atlantic" which are not applicable to the voyage will be omitted.

(b) In the case of vessels which engage in special services on coastwise voyages and voyages on the Great Lakes, the marks on the vessel's sides are to be in accordance with Figure 44.05–10(b), except that the lines marked "SW" and "MS" shall be used only where applicable.

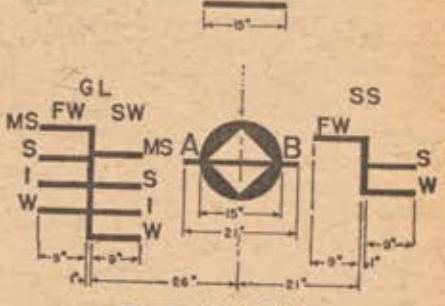


FIGURE 44.05–10(b).

(c) The load lines aft of the combined disk and diamond will be applicable for voyages on the Great Lakes and those on the forward side will be applicable to limited coastwise voyages. The summer line on the ocean will correspond to the summer line on the Lakes and the winter line on the ocean will correspond to the intermediate line on the Lakes.

(d) In the case of vessels which operate both on special service coastwise voyages and on unlimited coastwise voyages, the marks on the ship's sides are to be in accordance with figure 44.05–10 (d). The load lines aft of the disk will be applicable to voyages in special service coastwise or inter-island voyages and those on the forward side will be applicable to unlimited coastwise voyages. (A vessel marked for both special service and unlimited coastwise voyages and furnished with a load line certificate on the international form shall, when entering the foreign trade, arrange that the load line markings are in accord with the vessel's international load line certificate by the elimination of the marks aft of the disk.)

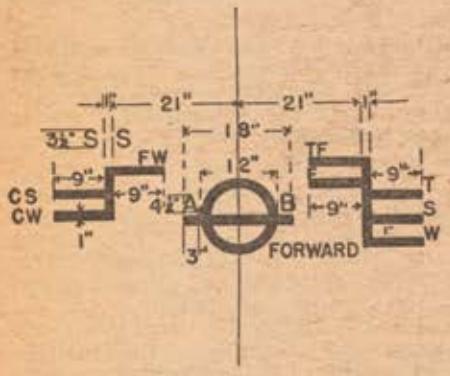


FIGURE 44.05–10 (d).

§ 44.05–15 Existing vessels.

(a) In assigning load lines to an existing vessel the provisions of the regulations in this part shall be complied with in principle and detail insofar as is reasonable and practicable, having regard to the proven efficacy of existing arrangements for a special service voyage, and having particular regard to the provision of sufficient means for the protection and safety of the crew.

(b) Where it is neither reasonable nor practicable to comply with this part in its entirety, the assigning authority will, in each case, report to the Commandant, U. S. Coast Guard, the specific matters in which the vessel is deficient with such recommendations as may seem desirable. Upon the receipt of this report the Commandant, U. S. Coast Guard, shall determine such addition to the freeboard as will, in the judgment of the Commandant, U. S. Coast Guard, make the vessel as safe as if it had fully complied with this part.

§ 44.05–20 Conditions of assignment.

(a) *Steam colliers.* The conditions of assignment for steam colliers shall be in accordance with the requirements of Part 43 of this subchapter and also with the supplementary requirements of §§ 43.30–1 to 43.30–70 of this subchapter in cases where a tanker freeboard is assigned, except that in the case of steam colliers constructed with bulwarks, the freeing port may be of a practically continuous slot type, located as low as possible, the clear area of the slot to be not less than 20 percent of the superficial area of the unpierced bulwarks. If, due to sheer, or other conditions, the assigning authority considers that extra local provision should be made for freeing decks of water, the slots are to be located so as to have maximum efficacy.

(b) *Towed barges.* The conditions of assignment for towed cargo barges where the cargo is carried under deck shall be in accordance with §§ 45.10–5 to 45.10–100 of this subchapter. In the case of tank barges and cargo barges carrying cargo only on deck, compliance will also be required with the supplementary conditions of §§ 45.20–1 to 45.20–70 of this subchapter. In the case of cargo barges of the open type, assignment will be limited to barges in unmanned operation and the construction of the vessel must be such as to satisfy the assigning authority that no unusual hazards will be experienced.

(c) *Self-propelled barges.* The conditions of assignment for self-propelled cargo barges carrying cargo under decks shall be in accordance with the provisions of §§ 45.10–5 to 45.10–100 of this subchapter. In the case of self-propelled tank barges and self-propelled cargo barges carrying cargo only on deck, compliance will also be required with the supplementary conditions of §§ 45.20–1 to 45.20–70 of this subchapter.

§ 44.05–25 Freeboards.

(a) *General.* (1) When the assigning authority is satisfied that the requirements of this part as applicable to the type of vessel under consideration are complied with the freeboards will be computed as described in this section.

(2) In the assignment of freeboards under this part, the provisions of § 43.01–32 relating to stability are applicable.

(b) *Steam colliers.* Steam colliers that have constructional features similar to those of a tanker which afford extra invulnerability against the sea may be assigned a reduction of freeboard from that determined under §§ 43.15–1 to 43.15–97 of this subchapter. The amount of such reduction shall be determined by the assigning authority, in relation to the freeboard assigned to tankers, having regard to the degree of compliance with the supplementary conditions of assignment laid down for these ships, but without regard to the degree of subdivision provided. The freeboard assigned to such a vessel shall in no case be less than would be assigned the vessel as a tanker, as determined by §§ 43.30–1 to 43.30–70 of this subchapter.

(c) *Towed cargo barges with cargo under deck.* The freeboard is to be computed under §§ 45.15–1 to 45.15–97 of this subchapter. The fresh water and seasonal markings where applicable are to be determined from §§ 43.15–1 to 43.15–97 of this subchapter.

(d) *Towed cargo barges with cargo only on deck.* The freeboard for barges of this type is to be computed in accordance with the requirements of §§ 45.20–1 to 45.20–70 of this subchapter. The fresh water and seasonal markings where applicable are to be the same as determined from §§ 43.15–1 to 43.15–97 of this subchapter.

(e) *Towed cargo barges of the open type.* The load line shall be placed where, in the judgment of the assigning authority, the draft will be such that no unusual hazard will be experienced. In general, drafts assigned will be such that the barge will remain afloat with a reasonable freeboard after flooding of the net available open space.

(f) *Towed tank barges.* The freeboard is to be computed in accordance with §§ 45.20–1 to 45.20–70 of this subchapter. The fresh water and seasonal markings where applicable are to be determined from §§ 43.15–1 to 43.15–97 of this subchapter.

(g) *Self-propelled cargo barges.* The freeboard is to be computed under §§ 45.15–1 to 45.20–15 of this subchapter. The fresh water and seasonal markings where applicable are to be determined from §§ 43.15–1 to 43.15–97 of this subchapter.

(h) *Self-propelled tank barges.* The freeboard is to be computed in accordance with §§ 45.20–1 to 45.20–70 of this subchapter. The fresh water and seasonal markings where applicable are to be determined from §§ 43.15–1 to 43.15–97 of this subchapter.

§ 44.05–30 Load line certificate.

(a) The load line certificates for a special service coastwise or special inter-island voyage shall be issued in addition to any other applicable load line certificates and shall be on the form shown in § 44.05–35.

§ 44.05–35 Form of load line certificate.

(a) Where no other Load Line certificate is issued:

LOAD LINE CERTIFICATE FOR A SPECIAL SERVICE COASTWISE OR INTER-ISLAND VOYAGE

Issued under the authority of the Commandant, U. S. Coast Guard, United States of America, under the provisions of the Coastwise Load Line Act of August 27, 1935 as amended.

[SEAL]

Issued by_____

Certificate No._____

This certificate is valid only for coastwise or inter-island voyages that are between the limits of_____ and_____ provided the vessel is engaged solely in the trade stated herein.

Ship_____ Official No._____

Port of registry_____ Trade of vessel_____

Gross tonnage_____

FREEBOARD FROM DECK LINE		LOAD LINE
Tropical_____	(T)	_____Above (S)
Summer_____	(S)	--Upper edge of line through center of disk.
Winter_____	(W)	_____Below (S)

*Allowance for fresh water for all freeboards (except on the Great Lakes)_____
The upper edge of the deck line from which these freeboards are measured is_____ inches above the top of the____deck at side.



This is to certify that this ship has been surveyed and the freeboards and load lines shown above have been found to be correctly marked upon the vessel in manner and location as provided by the Load Line Regulations of the Commandant, U.S. Coast Guard, applicable to vessels engaged on this special service voyage.

**This certificate remains in force until _____ Issued at _____ on the _____ day of _____, 19____.

(Here follows the signature or seal and description of the assigning authority)

NOTES: (1) In accordance with the Load Line Regulations, the disk or diamond and the lines must be permanently marked by center punch marks or cutting.

(2) The load line assignment given by this certificate necessarily assumes that the nature and stowage of cargo, ballast, etc., are such as to secure sufficient stability for the vessel. Accordingly, it is the owner's responsibility to furnish the Master of the vessel with stability information and instructions when this is necessary to maintenance of sufficient stability.

(On the reverse side of the load line certificate, the provision for annual inspection endorsement and for renewal of the certificate is to be the same as for vessels engaged in the foreign trade.)

(b) Where the Special Service Load Line Certificate is issued in addition to a Great Lakes Load Line Certificate, the wording of the Special Service Load Line Certificate is to be identical to that given in paragraph (a) of this section, but the markings indicated in the form shall be replaced by the following markings:



(c) Where the Special Service Load Line Certificate is issued in addition to an Unlimited Coastwise or International Load Line Certificate, the wording of the Special Service Load Line Certificate is to be identical to that given in paragraph (a) of this section, but the markings indicated in the form shall be replaced by the following markings:



*Where seagoing steamers navigate a river or inland water, deeper loading is permitted corresponding to the weight of fuel, etc., required for consumption between the point of departure and the open sea.

**Upon the expiration of the certificate renewal must be obtained as provided by the Load Line Regulations and the certificate so endorsed. Endorsement should also be made in the spaces provided on the occasion of each annual inspection required by the Load Line Regulations.

PART 45—MERCHANT VESSELS WHEN ENGAGED IN A VOYAGE ON THE GREAT LAKES

Subpart 45.01—Administration

Sec.
45.01-1 Establishment of Great Lakes load lines.
45.01-5 Responsibility for administration.
45.01-10 Application of regulations.
45.01-13 Penalties for load line violations.
45.01-15 Tankers.
45.01-17 Cargo vessels.
45.01-20 Vessels of special design.
45.01-22 Stability.
45.01-25 Marks to indicate maximum load lines.
45.01-30 Assignment and certification of load lines; assigning authority.
45.01-35 Survey for the assignment of new load line and renewal of load line certificate.
45.01-40 Annual load line inspection.
45.01-45 Application for assignment, renewal, and certification of load line marks.
45.01-50 Application for annual load line inspections.
45.01-55 Equivalents.
45.01-60 Validity of certificates; renewal of certificates.
45.01-65 Form of certificate.
45.01-70 Cancellation of load line certificate.
45.01-75 Seasonal load lines.
45.01-80 Logbook entries.
45.01-85 Control.
45.01-90 Approval of the Commandant.

Subpart 45.05—General Rules for Determining Maximum Load Lines of Merchant Vessels on the Great Lakes

45.05-1 Definitions.
45.05-5 Deck line.
45.05-10 Load line diamond.
45.05-15 Lines to be used in connection with the diamond.
45.05-20 Mark of assigning authority.
45.05-25 Details of marking.
45.05-30 Verification of marks.

Subpart 45.10—Conditions of Assignment of Load Lines

45.10-1 Construction of vessel.
45.10-5 Cargo and other hatchways not protected by superstructures.
45.10-10 Hatchway coamings.
45.10-15 Hatchway covers.
45.10-20 Hatchway beams.
45.10-25 Carriers or sockets.
45.10-30 Cleats and fasteners.
45.10-35 Battens and wedges.
45.10-40 Tarpaulins.
45.10-45 Security of hatchway covers.
45.10-50 Cargo and other hatchways in the freeboard deck within superstructures which are fitted with closing appliances less efficient than class 1.
45.10-55 Hatchway coamings and closing arrangements.
45.10-57 Machinery space openings in exposed positions on freeboard and raised quarter-decks.
45.10-60 Machinery space openings in exposed positions on superstructure decks other than raised quarter-decks.
45.10-65 Machinery space openings in the freeboard deck within superstructures which are fitted with closing appliances less efficient than class 1.
45.10-67 Flush scuttles.
45.10-70 Companionways.
45.10-75 Ventilators in exposed positions on freeboard and superstructure decks.
45.10-77 Air pipes.
45.10-80 Gangway, cargo, and coaling ports, etc.
45.10-85 Scuppers and sanitary discharge pipes.
45.10-87 Air ports.
45.10-90 Guardrails.
45.10-95 Freeing ports.
45.10-100 Protection of crew.

Subpart 45.15—Load Lines for Steamers

45.15-1 Length (L).
45.15-5 Breadth (B).
45.15-7 Molded depth.
45.15-10 Depth for freeboard (D).
45.15-15 Coefficient of fineness (c).
45.15-17 Strength.
45.15-20 Height of superstructure.
45.15-25 Standard height of superstructure.
45.15-27 Length of superstructure (S).
45.15-30 Inclosed superstructure.
45.15-35 Superstructure bulkheads.
45.15-37 Class 1 closing appliances.
45.15-40 Class 2 closing appliances.
45.15-45 Temporary closing appliances.
45.15-47 Superstructures, general.
45.15-50 Poop.
45.15-55 Raised quarter-deck.
45.15-57 Bridge.
45.15-60 Forecastle.
45.15-65 Trunk.
45.15-67 Enclosed superstructure with middle line openings in the deck not provided with permanent means of closing.
45.15-70 Deductions for superstructures.
45.15-73 Sheer, general.
45.15-75 Standard sheer profile.
45.15-77 Measurement of variations from standard sheer profile.
45.15-80 Correction for variations from standard sheer profile.
45.15-83 Addition for deficiency in sheer.
45.15-85 Deduction for excess sheer.
45.15-87 Standard round of beam.
45.15-90 Round of beam correction.
45.15-93 Summer freeboard.
45.15-94 Midsummer freeboard.
45.15-95 Intermediate and winter freeboard.
45.15-96 Salt water freeboard.
45.15-97 Freeboard table for steamers.

Subpart 45.20—Load Lines for Tankers

45.20-1 Definition.
45.20-5 Marks on sides.
45.20-10 Construction.
45.20-15 Forecastle.
45.20-20 Machinery casings.
45.20-25 Gangway.
45.20-30 Protection of crew, access to machinery space, etc.
45.20-35 Hatchways.

Sec.
45.20-40 Ventilators.
45.20-45 Freeing arrangements.
45.20-50 Plans.
45.20-55 Computation of freeboard.
45.20-60 Deductions for detached superstructures.
45.20-65 Deduction for excess sheer.
45.20-70 Freeboard table for tankers.

Subpart 45.25—Fees and Form of Certificate

45.25-1 Fees.
45.25-5 Form of load line certificate.

AUTHORITY: The provisions of this Part 45 issued under sec. 2, 49 Stat. 888, as amended; 46 U.S.C. 88a. Treasury Department Orders 120, July 31, 1950, 15 F.R. 6521; 167-48, October 19, 1962, 27 F.R. 10504, unless otherwise noted.

Subpart 45.01—Administration

§ 45.01-1 Establishment of Great Lakes load lines.

(a) Load lines are established for merchant vessels of 150 gross tons or over when engaged on Great Lakes voyages in conformity with the Coastwise Load Line Act, 1935, as amended (46 U.S.C. 88-88i).

(b) Load lines for merchant vessels of 150 gross tons or over when engaged on Great Lakes voyages shall be pursuant to the regulations in this part.

(c) The load line regulations for merchant vessels when engaged in foreign voyages (the Great Lakes excepted) or coastwise voyages are in Part 43 of this subchapter. The load line regulations applicable to coastwise load lines for steam colliers, barges, and self-propelled barges in specially limited coastwise voyages are in Part 44 of this subchapter.

(d) In concurrence with related Canadian regulations, the waters of the St. Lawrence River west of a straight line drawn from Cap de Rosiers to West Point Anticosti Island, and west of a line along 63° W. longitude from Anticosti Island to the north shore of the St. Lawrence River shall be considered as a part of the Great Lakes.

§ 45.01-5 Responsibility for administration.

(a) Under the general direction and supervision of the Secretary of the Treasury, the Commandant of the United States Coast Guard is delegated the responsibility and authority for the administration of the Coastwise Load Line Act, 1935, as amended (46 U.S.C. 88-88i).

§ 45.01-10 Application of regulations.

(a) No merchant vessel of the United States of 150 gross tons or over shall proceed on a voyage on the Great Lakes, or arrive from a voyage on the Great Lakes, or operate on the Great Lakes, and no foreign merchant vessel of 150 gross tons or over shall arrive from a voyage on the Great Lakes or shall proceed on a voyage on the Great Lakes, when within the jurisdiction of the United States, unless such vessel is:

(1) Marked with load lines under the load line regulations in Part 43 of this subchapter and has on board a valid load line certificate, or

(2) A foreign vessel exempted under section 5 of the Coastwise Load Line Act, 1935, or is marked and certificated as to load lines under the provisions of and in accordance with the International Load Line Convention 1930 and has on board a valid load line certificate, or

(3) A new vessel:

(i) Has been surveyed in accordance with the provisions of this part.

(ii) Complies with the provisions of this part as applicable to the type of vessel dealt with.

(iii) Has been marked in accordance with the provisions of this part.

(iv) Has had the marks certified as correct as provided by this part.

(A new vessel is one whose keel was laid on or after August 27, 1935.)

(4) An existing vessel:

(i) Has been surveyed, marked, and the marks certified either under the provisions of the regulations in this part as applicable to the type of vessel, or

(ii) Complies as defined for the type of vessel with the provisions of this part in principle and detail so far as is reasonable and practicable, having regard to the efficacy of the protection of openings, guard rails, freeing ports, and means of access to crews quarters, provided by the existing arrangements, fittings, and appliances of the vessel.

(b) Where it is neither reasonable nor practicable to comply with this part in its entirety, the assigning authority will, in each case, report to the Commandant, U. S. Coast Guard, the specific matters in which the vessel is deficient with such recommendations as seem desirable. Upon the receipt of this report the Commandant, U. S. Coast Guard, shall determine such addition to the freeboard as will, in the judgment of the Commandant, U. S. Coast Guard, make the vessel as safe as if it had fully complied with this part.

§ 45.01-13 Penalties for load line violations.

(a) For violations of the Coastwise Load Line Act, 1935, as amended (46 U.S.C. 88-88i), and the regulations in this subchapter, which apply to merchant vessels engaged in voyages on the Great Lakes, see § 43.01-13 of this subchapter for a description of the applicable penalties and procedures.

§ 45.01-15 Tankers.

(a) A steamer specially constructed for the carriage of liquid cargoes in bulk which has been surveyed as provided by § 45.01-10 shall be marked with tanker load lines and the marks certified as correct, if being:

(1) A new vessel, it complies with the conditions and provisions prescribed in §§ 45.20-10—45.20-70.

(2) An existing vessel, it complies with the conditions and provisions in §§ 45.20-10, 45.20-25—45.20-40 and, also, in principle so far as is reasonable and practicable, with §§ 45.20-15, 45.20-20, 45.20-45: *Provided*, That in assigning a tanker load line to an existing vessel such additions to the freeboard shall be made as is reasonable having regard to the extent to which the vessel falls short of full compliance with the conditions and provisions prescribed in §§ 45.20-15, 45.20-20, 45.20-45.

(b) For the purpose of the application of §§ 45.01-75, 45.05-15 and 45.15-94 there are included non-propelled tank barges of shipshape form specially constructed for the carriage of liquid cargoes in bulk.

§ 45.01-17 Cargo vessels.

For the purpose of §§ 45.01-75, 45.05-15 and 45.15-94 a cargo vessel is defined as a vessel either self-propelled or non-propelled of shipshape form constructed for the carriage of dry cargoes, and which is regularly engaged in the transportation thereof.

§ 45.01-20 Vessels of special design.

(a) Sand suckers and other vessels of special design that cannot be assigned load lines by direct application of the rules set forth in this subchapter, will be assigned load lines based on the individual consideration of each vessel. Before such vessels are marked and certified, the assigning authority shall obtain the approval of the Commandant, U. S. Coast Guard, as to the position of the load line marks.

(b) In the location of load lines on sand suckers and similar vessels, consideration will be given to the effect of flooding of open cargo spaces, and the draft permitted will not be in excess of that which, in the judgment of the assigning authority, with the approval of the Commandant, U. S. Coast Guard, provides a reasonable margin of safety under such circumstances.

(c) Open hopper type barges will be limited to unmanned operation over restricted routes.

§ 45.01-22 Stability.

(a) The rules of this part necessarily assume that the nature and stowage of the cargo, ballast, etc., are such as to secure sufficient stability for the vessel.

(b) Having regard for the fact that certain vessels, such as those carrying all their cargo as deck cargo, may need to have the amount of cargo and resulting draft limited by stability considerations, the load line assignments of vessels, which are subject to the stability test requirements contained in § 31.10-30 in Subchapter D (Tank Vessels) or in Subpart 93.05 in Subchapter I (Cargo and Miscellaneous Vessels) of this chapter, shall in no case be deeper than permitted by the results of such tests.

(c) Load line assignments to vessels not subject to inspection will also be made subject to the results of a stability test if the design and service of the vessels are such as to indicate the need for a draft limitation based thereon.

(d) Load line assignments made to vessels before the results of stability tests are known shall be regarded as conditional and subject to verification by the Commandant.

(R.S. 4417, as amended, 4417a, as amended, secs. 1, 2, 49 Stat. 1544, as amended; 46 U.S.C. 391, 391a, 367)

§ 45.01-25 Marks to indicate maximum load lines.

(a) Marks to indicate maximum mean drafts to which a vessel can be lawfully submerged, in the various circumstances

and seasons, shall be permanently marked on each side of the vessel in the form, manner, and location provided by this part.

§ 45.01–30 Assignment and certification of load lines; assigning authority.

(a) As provided in the Coastwise Load Line Act, 1935, the American Bureau of Shipping is appointed to assign load lines and to determine whether the position of and the manner of marking each vessel to which the act applies has been performed in accordance with this part, and is authorized to issue a load line certificate, certifying to the correctness of the marks under its own hand and seal. As provided in the aforesaid act, the Commandant, U. S. Coast Guard may, at the request of a shipowner, appoint any other recognized classification society which he may approve, as the load line assigning authority. The American Bureau of Shipping (Mailing address: 45 Broad Street, New York, N.Y., 10004), or other approved load line assigning agency, is authorized to renew from time to time by endorsement a load line certificate. Load line certificates will not be issued until the load line marks have been verified. This certificate will be issued in duplicate, one copy being delivered to the owner or master of the vessel and one copy, together with a summary of the data used to determine the load line will be forwarded to the Commandant, U.S. Coast Guard, Washington, D.C., 20226. In addition, each new vessel, when receiving its first load line certificate, shall be furnished a copy of the load line survey report which shall be retained on board to be available for the information of inspectors and surveyors when carrying out subsequent load line surveys.

(b) The agency appointed by the Commandant, U. S. Coast Guard, to assign load lines as provided by section 3 of the Coastwise Load Line Act, 1935 (49 Stat. 888; 46 U. S. C. 88b), is referred to in this part as the assigning authority.

(c) The fees to be charged by the assigning authority for services in connection with this part shall not exceed the scale of maximum fees as set forth in § 45.20–75.

(Sec. 2, 45 Stat. 1493, as amended; 46 U.S.C. 85a)

§ 45.01–35 Survey for the assignment of new load line and renewal of load line certificate.

(a) *Steel vessels.* (1) Unless specifically waived by the Commandant, U.S. Coast Guard, the vessel is to be placed in drydock to determine the condition of the hull plating and underwater connections.

(2) The holds, 'tween decks, peaks, bilges, engine and boiler spaces, and bunkers are to be examined to determine the condition of the structure.

(3) Deep tanks and other tanks which form part of the vessel are to be examined internally.

(4) Where a double bottom is fitted, the tanks are to be examined internally. Where double bottom and other tanks are used for fuel oil bunkers, such tanks need not be cleaned out, provided the surveyors are able to determine by an external examination that their general condition is satisfactory.

(5) The decks are to be examined.

(6) The hatch covers, hatch beams, and fore-and-afters, tarpaulins, battens and wedges, the hatchway and ventilator coamings, companionways, the engine and boiler casings, the superstructures on the freeboard deck, and all means of protecting the openings in the freeboard deck and superstructures are to be examined.

(7) All air pipe outlets, scuppers, sanitary discharges in the vessel's sides, and air ports are to be examined.

(8) All gangways, cargo, and coaling ports or similar openings in the vessel's sides are to be examined.

(9) Guardrails, gangways, and freeing ports are to be examined.

(10) Where, owing to the age and condition of the vessel, the surveyors deem it necessary, the shell and deck plating may be required to be drilled in order to ascertain the thickness of such plating.

(b) *Wood and composite vessels.* (1) Unless specifically waived by the Commandant, U. S. Coast Guard, the vessel is to be placed on a drydock or a slipway and the keel, stem, sternframe or sternpost, and outside planking are to be examined. Caulking is to be tried at such places about the planking as is deemed necessary by the surveyors.

(2) Careful examination must be made for faulty fastenings and such bolts or treenails must be backed out, or otherwise dealt with, as may be deemed necessary by the surveyors.

(3) Careful examination is to be made of the entire structure and, if considered necessary, borings are to be made to ascertain the conditions of the material; should these disclose cause for further examination, listings are to be made where required to satisfy the surveyors as to the true condition of the vessel.

(4) The holds, 'tween decks, peaks, bilges, engine and boiler spaces, and bunkers are to be examined.

(5) The decks are to be examined and bored where necessary.

(6) The hatch covers, hatch beams, fore-and-afters, tarpaulins, battens, and wedges, the hatchway and ventilator coamings, companionways, the engine and boiler casings, the superstructures on the freeboard deck, and all means of protecting the openings in the freeboard deck and superstructures are to be examined.

(7) All air pipe outlets, scuppers, sanitary discharges in the vessel's sides, and air ports are to be examined.

(8) Guardrails, gangways, and freeing ports are to be examined.

(c) *Correction of deficiencies.* Any such structure or parts or fittings of the vessel as are found to be in an unsatisfactory condition are to be rebuilt or repaired or renewed in order to place the vessel in a seaworthy condition so as to be eligible for a load line certificate.

§ 45.01–40 Annual load line inspection.

(a) A vessel having been marked as provided by this part, and the mark certified as correct, will be inspected at intervals of approximately 12 months in order to insure the maintenance in an effective condition of the fittings and appliances for the:

(1) Protection of openings,

(2) guardrails,

(3) freeing ports,

(4) means of access to crew's quarters, and that there have not been alterations made to the hull or superstructures, which would affect the calculations determining the position of the load lines.

(b) If upon examination the fittings and appliances are found to be in a satisfactory condition, the load line certificate will be endorsed to this effect. If it shall be found that alterations have been made to the hull or superstructures that affect the calculations determining the position of the load line, the matter shall be reported to the Commandant, U.S. Coast Guard, for appropriate action.

(c) The assigning authority shall make this inspection and report thereon to the owners of the vessel, and a copy of such report shall be forwarded to the Commandant, U. S. Coast Guard, Washington, D.C., 20226.

§ 45.01–45 Application for assignment, renewal, and certification of load line marks.

(a) Application for assignment and certification of load line marks or for renewal of load line certificates shall be made in writing to the assigning authority by the owners of the vessel.

§ 45.01–50 Application for annual load line inspections.

(a) Application for annual load line inspection required by § 45.01–40 shall be made in writing to the assigning authority by the owners of a vessel.

§ 45.01–55 Equivalents.

(a) Where in the regulations in this part it is provided that a particular fitting or appliance, or type thereof, shall be fitted or carried in a vessel, or that any particular arrangement shall be adopted, there may be substituted any other fitting or appliance or type thereof, or any other arrangement: *Provided*, That such fitting, appliance, or arrangement shall be considered a suitable equivalent by the assigning authority and the approval of the Commandant, U.S. Coast Guard, for such substitution shall have been issued.

§ 45.01–60 Validity of certificates; renewal of certificates.

(a) As the assignment of load lines is conditioned upon the structural efficiency of the vessel and upon the provision of effective protection to vessel and crew, every vessel required to be marked by the Coastwise Load Line Act, 1935, with load lines shall be surveyed by the assigning authority at least once in each 6 years to determine that the load lines are then correctly placed as required by this part. If the load line mark be found correct for the vessel in the condition she is then in, the certificate shall be renewed for such time as the condition of the

vessel then warrants, but in no case for a longer period than 6 years and the facts shall be attested by endorsement upon the back of the certificate in the form shown in § 45.25–5.

(b) The Commandant, U. S. Coast Guard, shall be notified of every renewal endorsement and the date of its expiration.

(c) Foreign vessels which have not been exempted pursuant to section 5 of the Load Line Act shall have their load line certificate limited to a period of 1 year. The certificate may be validated for additional 1-year periods (provided, after survey, the condition of the vessel is found to warrant such validation, and the facts are attested by endorsement upon the back of the load line certificate by a surveyor of the American Bureau of Shipping or of the classification society issuing the certificate.) The certificate will become void 5 years from date of issue, or at the expiration of the fourth yearly validation, whichever occurs first.

§ 45.01–65 Form of certificate.

(a) The form for certificates certifying to the correctness of the load line mark as required by the Coastwise Load Line Act, 1935, is shown in § 42.25–5.

§ 45.01–70 Cancellation of load line certificate.

(a) Notwithstanding the marking of a load line and the issuance of a load line certificate, the certificate will be cancelled if:

(1) The annual load line inspection required by § 45.01–40 has not been carried out or that the items described under § 45.01–40 are not maintained in an effective condition; or

(2) The survey required by § 45.01–35 has not been carried out, or that any defects disclosed by the survey have not been corrected; or

(3) Due to any cause the conditions of assignment have not been maintained as provided by the regulations in this part, or alterations have been made to hull or superstructures which affect the calculations made to determine the location of the load line.

§ 45.01–75 Seasonal load lines.

(a) For load line purposes there is hereby established for the Great Lakes a winter, intermediate, summer, and for tankers and cargo vessels (see §§ 45.01–15 and 45.01–17) a midsummer season, and load lines applicable to each season are established by the regulations in this part. The winter season shall be that period from November 1 through April 15 of the next year, the intermediate seasons from April 16 through April 30, and from October 1 through October 31, and the summer season from May 1 through September 30. The midsummer season shall be the portion of the summer season from May 1 through September 15 which shall be applicable only in those cases where midsummer season load lines are permitted. (All dates are inclusive.)

(b) For those vessels that are marked and certificated with load lines under the International Load Line Convention, 1930, the load line marks shall be applicable to voyages on the Great Lakes in accordance with Table 45.01–75 (b).

TABLE 45.01–75 (b)

Load line mark. salt water:	*Season applicable*
Tropical (T)	May 1–Sept. 30 (summer).
Summer (S)	Apr. 16–30, Oct. 1–31 (intermediate).
Winter (W)	Nov. 1–Apr. 15 (winter).

NOTE: In the case of cargo vessels and tankers as defined in §§ 45.01–15 and 45.01–17 loading to the tropical fresh water mark (TF) for the midsummer season may be authorized. In such cases a special supplementary certificate shall be issued.

(c) When engaged on voyages between the limits of Toledo Harbor and Port Huron, Michigan, cargo and tank vessels above 300 feet in length may load to their intermediate marks between October 1 and April 30, inclusive. Such vessels above 400 feet in length may load to their summer marks between September 16 and April 30, inclusive.

(d) Except as provided in paragraph (c) of this section, no vessel shall be loaded so as to submerge at any time the load line applicable to the season.

§ 45.01–80 Logbook entries required.

(a) It is the master's responsibility to have entered in the vessel's "Official Logbook" if carried, otherwise in a log considered as its official logbook, the data required by section 6 of the Coastwise Load Line Act, 1935, as amended (46 U.S.C. 88e). These logbook entries shall be made before a vessel departs from her loading port or place and consist of:

(1) A statement of the load line marks applicable to the voyage;

(2) A statement of the position of the load line mark, port and starboard, at the time of departing from a port or place; and,

(3) The actual drafts of the vessel, forward and aft, as nearly as the same can be ascertained, at the time of departing from a port or place.

§ 45.01–85 Control.

(a) The Collector of Customs or the Coast Guard District Commander may detain a vessel for survey if there is reason to believe that the vessel is proceeding on her journey in excess of the draft allowed by the regulations in this part as indicated by the vessel's load line certificate, or otherwise. The Coast Guard District Commander may detain a vessel if it is so loaded as to be manifestly unsafe to proceed.

(b) If the Collector of Customs orders a vessel detained, he shall immediately inform the Coast Guard District Commander thereof, who shall thereupon advise the Collector of Customs whether or not he deems that the vessel may proceed with safety. If the Coast Guard District Commander orders a vessel detained, such officer will furnish the Collector of Customs immediate notification of such detention. The clearance shall be refused to any vessel which shall have been ordered detained, which shall be in effect until it is shown that the vessel is not in violation of the Coastwise Load Line Act, 1935, as amended (46 U.S.C. 88–88l), and the regulations in this subchapter.

(c) The detention of a vessel will be by written order of either the Coast Guard District Commander or the Collector of Customs, depending on who orders the detention. The detaining officer will immediately arrange for a survey in the manner prescribed by section 7 of the Coastwise Load Line Act, 1935, as amended (46 U.S.C. 88f). Unless the owner or agent waives in writing and stipulates to accept the Coast Guard's survey, the detaining officer shall appoint three disinterested surveyors, and where practicable, one of them shall be from the Surveying Staff of the American Bureau of Shipping. Such surveyors shall conduct a survey to ascertain whether or not the vessel is loaded in violation of the applicable provisions of the Coastwise Load Line Act, 1935, as amended (46 U.S.C. 88–88l), and the regulations in this part. If the survey confirms the allegation that the vessel is in violation of the law or the regulations in this part "the owner and agent shall bear the costs of the survey in addition to any penalty or fine imposed," as provided in this law. When such surveyors are appointed by the Collector of Customs, such appointment shall be with the approval of the Coast Guard District Commander.

(d) Whenever a vessel is detained, the master or owner may, within five days, appeal to the Commandant, United States Coast Guard, who may, if he desires, order a further survey, and may affirm, set aside, or modify the order of the detaining officer.

(e) Where a foreign vessel is detained, or any action is taken which would appear likely to result in legal proceedings being taken against such a vessel, the consul of the country to which the vessel belongs shall be informed as soon as possible of the circumstances of the case.

(f) Pursuant to the provisions of section 5 of the Coastwise Load Line Act, 1935, as amended (46 U.S.C. 88d), it is hereby certified that a vessel of a foreign country which has ratified the International Load Line Convention, 1930, shall be deemed a vessel of a foreign country as described in section 5 of this act, and such a vessel shall be exempt from the provisions of the regulations in this part insofar as the marking of the load lines and the certificating thereof are concerned, only so long as such country similarly recognizes the load lines established by the regulations in this part, for the purpose of a voyage by sea: *Provided*, That the vessel is marked with load lines and has on board a valid load line certificate certifying to the correctness of the mark, the vessel shall not be loaded beyond the limits allowed by the certificate, the position of the load line of the vessel shall correspond with the certificate, the hull and superstructure shall not have been so materially altered as to affect the calculations on which the load line was based, and alterations have not been made so that the protection of openings, guardrails, freeing ports, and means of access to crew's quarters have made the vessel manifestly unfit to proceed to sea without danger to human life.

§ 45.01–90 Approval of the Commandant.

(a) Where the active approval of the Commandant, U.S. Coast Guard, is required in connection with this part, such information as will enable the Commandant, U.S. Coast Guard, to obtain a comprehensive understanding of the question at issue shall be furnished and will remain with the Commandant, U. S. Coast Guard, as a record.

Subpart 45.05—General Rules for Determining Maximum Load Lines of Merchant Vessels on the Great Lakes

§ 45.05–1 Definitions.

(a) *Steamer.* (1) The term "steamer" or "steamship" includes all vessels having sufficient means for mechanical propulsion, except where provided with sufficient sail area for navigation under sails alone.

(2) A vessel fitted with mechanical means of propulsion and with sail area insufficient for navigation under sails alone may be assigned a load line under §§ 45.15–1—45.20–1.

(3) A lighter, barge, or other vessel without independent means of propulsion, when towed, is to be assigned a load line under §§ 45.15–1—45.20–1, except steel tank barges specially constructed for the carriage of liquids in bulk and cargo barges having only small access hatches in the freeboard deck, the load lines for which may be calculated under §§ 45.20–10—45.20–70.

(b) *Flushdeck vessel.* A flushdeck vessel is one which has no superstructure on the freeboard deck.

(c) *Superstructure.* A superstructure is a decked structure on the freeboard deck extending from side to side of the vessel. A raised quarter-deck is considered a superstructure.

(d) *Load line.* The load line is the line defining the maximum mean draft to which a vessel may be lawfully submerged. It is the lower limit of the freeboard as determined by the regulations in this part having regard to the various conditions and seasons.

(e) *Freeboard.* The freeboard assigned is the distance measured vertically downward at the side of the vessel amidships from the upper edge of the deck line to the upper edge of the load line.

(f) *Freeboard deck.* The freeboard deck is the deck from which the freeboard is measured, and is the uppermost complete deck having permanent means of closing all openings in weather portions of the deck in accordance with §§ 45.10–1—45.10–45. It is the upper deck in flushdeck vessels and vessels with detached superstructures. In vessels having discontinuous freeboard decks within superstructures which are not intact, or which are not fitted with class 1 closing appliances, the lowest line of the deck below the superstructure deck is taken as the freeboard deck.

(g) *Amidships.* Amidships is the middle of the length of the summer load waterline, as defined in § 45.15–1.

CROSS REFERENCE: For class 1 closing appliances, see § 45.15–37.

§ 45.05–5 Deck line.

(a) The deck line is a horizontal line 15 inches in length and 1 inch in breadth. It is to be marked amidships on each side of the vessel, and its upper edge is to pass through the point where the continuation outward of the upper surface of the freeboard deck intersects the outer surface of the shell. (See fig. 45.05–5 (a).) Where the deck is partly sheathed amidships, the upper edge of the deck line is to pass through the point where the continuation outward of the upper surface of the actual sheathing at amidships intersects the outer surface of the shell.

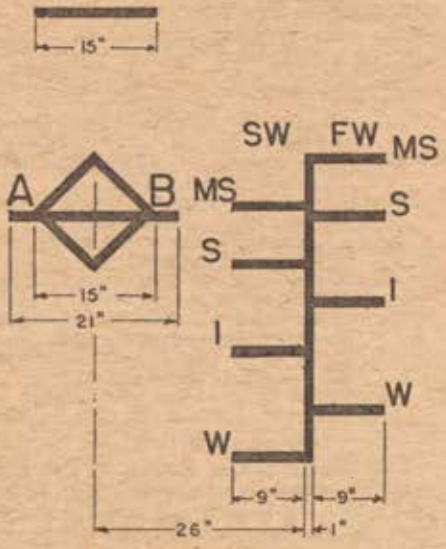


FIGURE 45.05–5(a).

NOTE: The line marked "MS" shall be used only when applicable to vessels defined in §§ 45.01–15 and 45.01–17.

§ 45.05–10 Load line diamond.

(a) The load line diamond is a square 15 inches on each diagonal with one diagonal vertical, the other horizontal, and is intersected by a horizontal line of 21 inches in length and 1 inch in breadth, the upper edge of which coincides with the horizontal diagonal of the diamond. The diamond is to be marked amidships below the deck line, port and starboard.

§ 45.05–15 Lines to be used in connection with the diamond.

(a) The lines which indicate the maximum load line in different seasons are to be horizontal lines, 9 inches in length and 1 inch in breadth, which extend from and are at right angles to a vertical line marked 26 inches forward of the center of the diamond. (See Figure 45.05–5(a).)

(b) The following are the lines to be used:

(1) *Midsummer load line.* The midsummer load line is indicated by the upper edge of a line marked "MS".

(2) *Summer load line.* The summer load line is indicated by the upper edge of the line which passes through the center of the diamond and also by a line marked "S".

(3) *Intermediate load line.* The intermediate load line is indicated by the upper edge of a line marked "I".

(4) *Winter load line.* The winter load line is indicated by the upper edge of a line marked "W".

(5) *Salt water load lines.* Ships which load in salt water of the St. Lawrence River and proceed to fresh water shall additionally be marked with horizontal lines, 9 inches in length and 1 inch in breadth extending from the vertical line referred to above towards the diamond. These lines shall be indicated as "S.W." marks and shall be additionally marked to indicate the corresponding Great Lakes season.

(c) Where the draft is restricted on a basis of subdivision or stability and this draft is less than any of the various seasonal drafts permitted by the regulations in this part, the center of the diamond shall be located on the line of this restricted draft and it shall be applicable to all seasons. If such a permissible maximum draft comes between the seasonal markings, the seasonal markings below shall also be added.

CROSS REFERENCE: For determining the salt water freeboard, see § 45.15–06.

§ 45.05–20 Mark of assigning authority.

(a) The authority by whom the load lines are assigned may be indicated by letters measuring about 4½ by 3 inches marked alongside the diamond and above the centerline.

§ 45.05–25 Details of marking.

(a) The diamond, lines, and letters are to be painted in white or yellow on a dark ground or in black on a light ground. They are also to be carefully cut in or center punched on the sides of iron and steel vessels, and on wood vessels they are to be cut into the planking for at least one eighth of an inch. The marks are to be plainly visible, and if necessary special arrangements are to be made for this purpose.

§ 45.05–30 Verification of marks.

(a) The load line certificate is not to be delivered to the vessel until a surveyor of the assigning authority has certified that the marks are correctly and permanently indicated on the vessel's side.

Subpart 45.10—Conditions of Assignment of Load Lines

§ 45.10–1 Construction of vessel.

(a) The assignment of load lines is conditional upon the vessel being structurally efficient and upon the provision of effective protection to vessel and crew.

(b) Sections 45.10–1—45.10–100 apply to vessels to which minimum freeboards are assigned. In vessels to which greater freeboards than the minimum are assigned, the protection is to be relatively as effective.

(c) Passenger vessels—Subdivision and stability load lines: Where in passenger vessels the positions of the maximum load lines are determined by the application of subdivision and stability regulations as provided in Part 46 of this subchapter pertaining to passenger vessels on the Great Lakes, the provisions of the regulations in this part shall also be effective insofar as they are applicable.

(R.S. 4491, as amended, sec. 5, 49 Stat. 1384, as amended; 46 U.S.C. 391, 369)

§ 45.10–5 Cargo and other hatchways not protected by superstructures.

(a) The construction and fittings of cargo and other hatchways in exposed positions on freeboard and superstructure decks are to be at least equivalent to the standards laid down in §§ 45.10–10—45.10–45.

(b) Where hatch covers are of adequate metal construction, sealed watertight against pliable gaskets by dogs or other suitable means, as approved by the Load Line Assigning Authority, the application of the requirements of §§ 45.10–10—45.10–45 will be modified accordingly.

§ 45.10–10 Hatchway coamings.

(a) The minimum height of hatchway coamings on freeboard decks is to be at least 18 inches above the deck. The minimum height of coamings on superstructure decks is to be at least 18 inches above the deck if situated within a quarter of the vessel's length from the stem, and at least 12 inches if situated elsewhere.

§ 45.10–15 Hatchway covers.

(a) On bulk freighters over 350 feet in length steel hatch covers are to be fitted to all exposed hatchways on the freeboard deck and they are to be of such thickness and provided with such stiffening as will enable them to be handled without deformation.

(b) Solid covers are to have stiffeners spaced not over 42 inches apart. The plating is to be not less than 0.24'' at 24-inch spacing and 0.36'' at 42-inch spacing with intermediate thicknesses at intermediate spacings. The stiffeners are not to be less effective than provided by angles, bulb angles or channels riveted or welded to the plate and having a section modulus in inches cubed not less than given by the formula:

$$I/y = S \times L^2 \times 0.025 \qquad (1)$$

where:

S = spacing of stiffeners in feet.
L = length in feet of the unsupported spans.
I = moment of inertia of the section.
y = distance from center of gravity of the section to the outermost strain fiber.

(c) Covers of the sliding plate type with flanges on one edge or with stiffeners riveted or welded to one edge shall have a sufficient number of sections so that when closed the spacing of the stiffeners does not exceed 42 inches. Plates are not to be less in thickness than required for solid steel covers in association with the spacing of the stiffeners when closed. The stiffening at the edge of the covers is not to be less effective than required above for solid covers. If hatch covers of the sliding plate type are used for spans exceeding 12'—1'', additional support must be provided, the details of which will be specially considered.

(d) Where wood hatch covers are used they are to be made of long leaf yellow pine or fir and the finished thickness is not to be less than 2¼ inches in association with a span of 6 feet. The width of each bearing surface is to be at least 2½ inches.

§ 45.10–20 Hatchway beams.

(a) Hatchways having wood covers are to be fitted with a system of main beams all extending in one direction or a system of main beams in association with auxiliary beams across the top of the main beams so arranged that the unsupported spans of the covers do not exceed 6 feet except where specially approved. The main beams may be of solid, rolled, or built shapes and the auxiliary beams may be either rolled shapes or timber of rectangular section. They are to have a section modulus in inches cubed of not less than given by the formula.

$$I/y = S \times L^2 \times C \qquad (1)$$

where:

S = the breadth of the area supported in feet.
L = the length of the unsupported spans in feet.
C = 0.03 for steel main beams where 18'' coamings are required.
C = 0.025 for steel auxiliary beams where 18'' coamings are required.
C = 0.025 for steel main beams where 12'' coamings are required.
C = 0.02 for steel auxiliary beams where 12'' coamings are required.
C = 0.15 for wood auxiliary beams where 18'' coamings are required.
C = 0.12 for wood auxiliary beams where 12'' coamings are required.
I = moment of inertia of the section.
y = distance from center of gravity of the section to the outermost strain fiber.

(b) Where rolled section beams are used the top flanges and the top angles in the case of built beams are to extend for the full length of the beams. Where wood auxiliary beams are used they are to be steel shod at all points where they bear on the main beams and at the ends.

§ 45.10–25 Carriers or sockets.

(a) Carriers or sockets for hatchway beams and fore-and-afters are to be of steel at least one-half inch thick, and are to have a width of bearing surface of at least 3 inches.

§ 45.10–30 Cleats and fasteners.

(a) Strong cleats at least 2½ inches wide or efficient clamping devices are to be fitted at intervals of approximately 2 feet from center to center; the end cleats are to be placed not more than 6 inches from each corner of the hatchway. Where steel sliding covers are fitted, patent fasteners of the "Mulholland type" or equal, spaced to suit the width of covers, may be used in place of cleats and wedges.

§ 45.10–35 Battens and wedges.

(a) Battens, wedges, or tarpaulin securing devices are to be efficient and in good condition.

§ 45.10–40 Tarpaulins.

(a) At least one tarpaulin in good condition, thoroughly waterproofed, and of ample strength, is to be provided for each hatchway in an exposed position on freeboard and superstructure decks. The material is to be guaranteed free from jute, and shall not be less than No. 4 cotton canvas or equal before waterproofing, or shall be of suitable synthetic fabric as approved for this purpose by the Load Line Assigning Authority.

§ 45.10–45 Security of hatchway covers.

(a) At all hatchways in exposed positions on freeboard or superstructure decks suitable provision is to be made for securing the covers after the tarpaulins are battened down.

§ 45.10–50 Cargo and other hatchways in the freeboard deck within superstructures which are fitted with closing appliances less efficient than class 1.

(a) The construction and fitting of such hatchways are to be at least equivalent to the standards laid down in §45.10–55 (a).

§ 45.10–55 Hatchway coamings and closing arrangements.

(a) Cargo, coaling, and other hatchways in the freeboard deck within superstructures which are fitted with class 2 closing appliances are to have coamings at least 9 inches in height and closing arrangements as effective as those required for exposed cargo hatchways.

(b) Where the closing appliances are less efficient than class 2, the hatchways are to have coamings at least 12 inches in height and are to have fittings and closing arrangements as effective as those required for exposed cargo hatchways.

(c) In the case of car ferries fitted with efficient "sea gates" extending above the freeboard deck at least to the height of a standard superstructure, coamings of less height may be fitted provided the hatches within superstructures are fitted with close fitting steel covers with efficient securing devices. When the openings in freeboard decks are not provided with closing devices the coamings are to extend above the freeboard deck at least to the height of a standard superstructure.

CROSS REFERENCE: For class 2 closing appliances, see § 45.15–40.

§ 45.10–57 Machinery space openings in exposed positions on freeboard and raised quarter-decks.

(a) Such openings are to be properly framed and efficiently enclosed by steel casings of ample strength, and where the casings are not protected by other structures their strength is to be specially considered; doors in such casings are to be of steel, efficiently stiffened, permanently attached, and capable of being closed and secured from both sides. The sills of openings are to be at least 18 inches above the freeboard deck and 12 inches on a raised quarter-deck.

(b) Fiddley, funnel, and ventilator coamings are to be as high above the deck as is reasonable and practicable. Fiddley openings are to have strong steel covers permanently attached in their proper positions. Engineroom skylights are to be of strong construction, preferably of steel.

§ 45.10–60 Machinery space openings in exposed positions on superstructure decks other than raised quarter-decks.

(a) Such openings are to be properly framed and efficiently enclosed by strong

steel casings. Doors in such cases are to be strongly constructed, permanently attached, and capable of being closed and secured from both sides. The sills of the openings are to be at least 9 inches above superstructure decks.

(b) Fiddley, funnel, and ventilator coamings are to be as high above the deck as is reasonable and practicable. Fiddley openings are to have strong steel covers permanently attached in their proper positions. Where the fiddley openings are more than 15 feet in height above the freeboard deck, covers need not be provided.

(c) Engineroom skylights are to be of strong construction, preferably of steel.

§ 45.10–65 Machinery space openings in the freeboard deck within superstructures which are fitted with closing appliances less efficient than class 1.

(a) Such openings are to be properly framed and efficiently enclosed by steel casings. Doors in such casings are to be strongly constructed, permanently attached, and capable of being securely closed. The sills of the openings are to be at least 6 inches above the deck where the superstructures are closed by class 2 closing appliances, and at least 12 inches above the deck where the closing appliances are less efficient than class 2.

CROSS REFERENCE: For class 2 closing appliances, see § 45.15–40.

§ 45.10–67 Flush scuttles.

(a) Flush scuttles, where fitted, are to be of iron or steel, of substantial construction, with screw or bayonet joints.

§ 45.10–70 Companionways.

(a) Companionways in exposed positions on freeboard decks and on decks of enclosed superstructures are to be of substantial construction. The sills of the doorways are to be 18 inches on freeboard decks and on superstructure decks within a quarter of the vessel's length from the stem and 12 inches on superstructure decks elsewhere. The doors are to be strongly constructed and capable of being closed and secured from both sides. Where the companionway is situated within a quarter of the vessel's length from the stem, it is to be of steel and riveted to the deck plating.

§ 45.10–75 Ventilators in exposed positions on freeboard and superstructure decks.

(a) Such ventilators to spaces below freeboard decks or decks of superstructures which are intact or fitted with class 1 closing appliances are to have coamings of steel, substantially constructed and sufficiently connected to the deck. The deck plating at the base of the coamings is to be efficiently stiffened between the deck beams. The openings of ventilator coamings are to be provided with efficient closing arrangements.

(b) Where such ventilators are situated on the freeboard deck, or on the superstructure deck within a quarter of the vessel's length from the stem, and the closing arrangements are of a temporary character, the coamings are to be at least 30 inches in height; in other exposed positions on the superstructure deck they are to be at least 24 inches in height. Where the coaming of any ventilator exceeds 36 inches in height, it is to be specially supported and secured.

§ 45.10–77 Air pipes.

(a) Where the air pipes to ballast and other tanks extend above the freeboard or superstructure decks, the exposed parts of the pipes are to be of substantial construction; the height from the deck to the opening is to be, when practical, at least 30 inches in wells on freeboard decks, 24 inches on raised quarter-decks, and 12 inches on other superstructure decks. Satisfactory means are to be provided for closing the openings of the air pipes. Where these heights may interfere with the working of the vessel a lower height may be approved provided the air pipe cap is properly protected and the air pipe is fitted with adequate means of closing.

§ 45.10–80 Gangway, cargo, and coaling ports, etc.

(a) Openings in the sides of vessels below the freeboard deck are to be fitted with watertight doors or covers, which, with their securing appliances, are to be of sufficient strength.

§ 45.10–85 Scuppers and sanitary discharge pipes.

(a) Discharges from scuppers and sanitary pipes led through the vessel's sides from spaces below the freeboard deck are to be fitted with efficient and accessible means for preventing water from passing inboard. Each separate discharge may have an automatic nonreturn valve with a positive means of closing it from a readily accessible position above the freeboard deck, or two automatic nonreturn valves without positive means of closing, provided the upper valve is situated so that it is always accessible for examination under service conditions. The positive-action valve is to be accessible and is to be provided with means for showing whether the valve is open or closed.

(b) Conditional upon the type and the location of the inboard ends of such openings, similar provisions may be prescribed by the assigning authority as to discharge from spaces within enclosed superstructures.

(c) Where scuppers are fitted in superstructures not fitted with class 1 closing appliances they are to have efficient means for preventing the accidental admission of water below the freeboard deck.

§ 45.10–87 Air ports.

(a) Air ports to spaces below the freeboard deck or to spaces below the superstructure deck of superstructures, closed by class 1 or class 2 closing appliances, are to be fitted with efficient inside deadlights permanently attached in their proper positions so that they can be effectively closed and secured watertight. Where, however, such spaces in superstructures are appropriated to passengers other than steerage passengers or to crew, the air ports may have portable deadlights stowed adjacent to the air ports, provided they are readily accessible at all times on service.

(b) The air ports and deadlights are to be of substantial and approved construction.

CROSS REFERENCE: For class 1 and class 2 closing appliances, see §§ 45.15–37, 45.15–40.

§ 45.10–90 Guardrails.

(a) Efficient guardrails or bulwarks are to be fitted on all exposed portions of freeboard and superstructure decks.

§ 45.10–95 Freeing ports.

(a) Where bulwarks on the weather portions of freeboard or superstructure decks form "wells" ample provision is to be made for rapidly freeing the decks of water and for draining them. The minimum freeing port area on each side of the vessel for each well on the freeboard deck and on the raised quarter-deck is to be that given by the following scale: The minimum area for each well on any other superstructure deck is to be one-half the area given by the scale. Where the length of the well exceeds .7*L*, the scale may be modified.

TABLE 45.10-95 (a)—SCALE OF FREEING PORT AREA

Length of bulwarks in "well" in feet	Freeing port area on each side in square feet	Length of bulwarks in "well" in feet	Freeing port area on each side in square feet
15	8.0	45	11.0
20	8.5	50	11.5
25	9.0	55	12.0
30	9.5	60	12.5
35	10.0	65	13.0
40	10.5	Above 65	(1)

[1] 1 square foot for each additional 5 feet length of bulwark.

(b) The lower edges of the freeing ports are to be as near the deck as practicable and preferably not higher than the upper edge of the gunwale bar. Two thirds of the freeing port area required is to be provided in the midship half of the well. In vessels with less than the standard sheer the freeing port area is to be suitably increased.

(c) All such openings in the bulwarks are to be protected by rails or bars spaced about 9 inches apart. If shutters are fitted to freeing ports, ample clearance is to be provided to prevent jamming. Hinges are to have brass pins.

§ 45.10–100 Protection of crew.

Gangways, lifelines, or other satisfactory means are to be provided for the protection of the crew in getting to and from their quarters.

Subpart 45.15—Load Lines for Steamers [1]

§ 45.15–1 Length (L).

(a) The length used with the rules and the freeboard tables is the length in feet on the summer load waterline from the foreside of the stem to the afterside of the rudder post. Where there is no rud-

[1] The provisions of §§ 45.01–1–45.01–90, inclusive, and §§ 45.05–1–45.10–100, inclusive, apply to all vessels having Great Lakes load lines and, for steamers, are supplemented by §§ 45.15–1–45.15–97, inclusive. Tankers having Great Lakes load lines are also subject to these requirements except as specifically modified in §§ 45.20–1–45.20–70, inclusive.

der post, the length is measured from the foreside of the stem to the axis of the rudder stock. For vessels with cruiser sterns, the length is to be taken as 96 percent of the total length on the designed summer load waterline or as the length from the foreside of the stem to the axis of the rudder stock if that be the greater.

§ 45.15–5 Breadth (B).

(a) The breadth is the maximum breadth in feet amidships to the molded line of the frame in iron or steel vessels and to the outside of the planking in wood or composite vessels.

§ 45.15–7 Molded depth.

(a) The molded depth is the vertical distance in feet, measured amidships, from the top of the keel to the top of the freeboard deck beam at side. In wood and composite vessels the distance is measured from the lower edge of the keel rabbet. Where the form at the lower part of the midship section is of a hollow character, or where thick garboards are fitted, the depth is measured from the point where the line of the flat of the bottom continued inwards cuts the side of the keel.

§ 45.15–10 Depth for freeboard (D).

(a) The depth used with the freeboard table is the molded depth plus the thickness of stringer plate, or plus

$$\frac{T(L-S)}{L} \qquad (1)$$

if that be greater, where

T is the mean thickness of the exposed deck clear of deck openings, and

S is the total length of superstructures as defined in § 45.15–27.

(b) Where the topsides are of unusual form, D is the depth of a midship section having vertical topsides, standard round of beam, and area of topside section equal to that in the actual midship section. Where there is a step or break in the topsides (that is, as in the turret-deck vessel) 70 percent of the area above the step or break is included in the area used to determine the equivalent section.

(c) In a vessel without an enclosed superstructure covering at least $0.6L$ amidships, without a complete trunk or without a combination of intact partial superstructures and trunk extending all fore and aft, the depth to be used with the freeboard table is not to be less than $L/15$ in vessels below 350 feet in length, nor less than those tabulated below for lengths above 350 feet (minimum depths at intermediate lengths are obtained by interpolation).

TABLE 45.15-10 (a)—FREEBOARD TABLE

L	Minimum depth	L	Minimum depth	L	Minimum depth
350	23.35	450	27.65	550	30.20
375	24.70	475	28.40	575	30.70
400	25.80	500	29.05	600	31.15
425	26.80	525	29.65	625	31.60

§ 45.15–15 Coefficient of fineness (c).

(a) The coefficient of fineness used with the freeboard table is given by

$$c=\frac{\Delta}{L.B.d_1} \qquad (1)$$

Where Δ is the volume in cubic feet of the vessel's molded displacement excluding bossing at a mean molded draft d_1 which is 85 percent of the molded depth. The coefficient c is not to be taken as less than 0.68, nor more than 0.86.

§ 45.15–17 Strength.

(a) The assigning authority is to be satisfied with the structural strength of vessels to which freeboards are assigned.

(b) Vessels which comply with the highest standard of the rules of a classification society recognized by the Commandant, U. S. Coast Guard, shall be regarded as having sufficient strength for the minimum freeboards allowed under Commandant, U. S. Coast Guard, in this part.

(c) Vessels which do not comply with the highest standard of the rules of a classification society recognized by the Commandant, U.S. Coast Guard, shall be assigned such increased freeboards as shall be determined by the assigning authority, and for guidance the following strength moduli are formulated:

(1) *Material.* The strength moduli are based on the assumption that the structure is built of mild steel, manufactured by the open-hearth process (acid or basic), and having a tensile strength of 60,000 to 72,000 pounds per square inch, and a minimum elongation on a length of 8 inches of at least

$$\frac{1{,}500{,}000}{\text{Tensile strength}}$$

(2) *Strength deck.* The strength deck is the uppermost deck which is incorporated into and forms an integral part of the longitudinal girder within the half-length amidships.

(3) *Depth to strength deck (Ds).* The depth to strength deck is the vertical distance in feet amidships from the top of the keel to the top of the strength deck beam at side.

(4) *Draft (d).* The draft is the vertical distance in feet amidships from the top of the keel to the center of the diamond except in those cases where midsummer marks are granted, the draft to be used is the draft to the midsummer mark.

(5) *Longitudinal modulus.* The longitudinal modulus $\frac{I}{y}$ is the moment of inertia I of the midship section about the neutral axis divided by the distance y measured from the neutral axis to the top of the strength deck beam at side, calculated in way of openings but without deductions for rivet holes. Areas are measured in square inches and distances in feet.

(i) Below the strength deck, all continuous longitudinal members other than such parts of underdeck girders as are required entirely for supporting purposes are included. Above the strength deck, the gunwale angle bar and the extension of the sheerstrake are the only members included.

(ii) The required longitudinal modulus for effective material is expressed by f. d. B., where f is the factor obtained from the Table 45.15–17 (c) (5) (ii).

TABLE 45.15–17 (c) (5) (ii)

L	f	L	f	L	
100	1.70	280	5.70	460	11.10
120	1.95	300	6.30	480	11.70
140	2.20	320	6.90	500	12.30
160	2.50	340	7.50	520	12.90
180	2.90	360	8.10	540	13.50
200	3.40	380	8.70	560	14.10
220	3.90	400	9.30	580	14.70
240	4.50	420	9.90	600	15.30
260	5.10	440	10.50	620	15.90

(iii) For intermediate lengths, the value of f is determined by interpolation.

(iv) This formula applies where the ratio $\frac{L}{D_s}$ does not exceed 13.5 in vessels of 325 feet length and under and 19 in vessels of 600 feet length and above. Intermediate values between lengths of 325 feet and 600 feet length are to be obtained by interpolation.

(6) *Frame.* For the purpose of the frame modulus, the frame is regarded as composed of a frame angle and a reverse angle each of the same size and thickness.

(7) *Frame modulus.* The modulus $\frac{I}{y}$ of the midship frame below the lowest tier of beams is the moment of inertia I of the frame section about the neutral axis divided by the distance y measured from the neutral axis to the extremity of the frame section, calculated without deduction for rivet and bolt holes. The modulus is measured in inch units.

(i) The required frame modulus is expressed by

$$\frac{s\ (d-t)\ (f_1+f_2)}{1{,}000} \qquad (2)$$

where:

s is the frame spacing in inches.

t is the vertical distance in feet measured at amidships from the top of the keel to a point midway between the top of the inner bottom at side and the top of the heel bracket (see fig. 45.15–17 (c) (7) (i)); where there is no double bottom, t is measured to a point midway between the top of the floor at center and the top of the floor at the side.

f_1 is a coefficient depending on H, which, in vessels fitted with double bottoms, is the vertical distance in feet from the middle of the beam bracket of the lowest tier of beams at side to a point midway between the top of the inner bottom at side and the top of the heel bracket (see fig. 45.15–17 (c) (7) (i)); where there is no double bottom, H is measured to a point midway between the top of the floor at center and the top of the floor at side. Where the frame obtains additional strength from the form of the vessel, due allowance is made in the value of f_1.

f_2 is a coefficient depending on K which is the vertical distance in feet from the top of the lowest tier of beams at side to a point 7 feet, 6 inches above the freeboard deck at side, or, if there is a superstructure, to a point 12 feet 6 inches above the freeboard deck at side. (See fig. 45.15–17 (c) (7) (i).) The values of f_1 and f_2 are obtained from Table 45.15–17 (c) (7) (i).

TABLE 45.15-17 (c) (7) (i)

H in feet	0	7.0	9.0	11.0	13.0	15.0	17.0	19.0	21.0	23.0	25.0
f_1	9	11.0	12.5	15.0	19.0	24.0	29.5	36.0	43.0	51.0	59.0
K in feet	0	5.0	10.0	15.0	20.0	25.0	30.0	35.0	40.0	.....	.....
f_2	0	.5	1.0	2.0	3.0	4.5	6.5	9.0	12.0	.....	.....

NOTE: Intermediate values are obtained by interpolation.

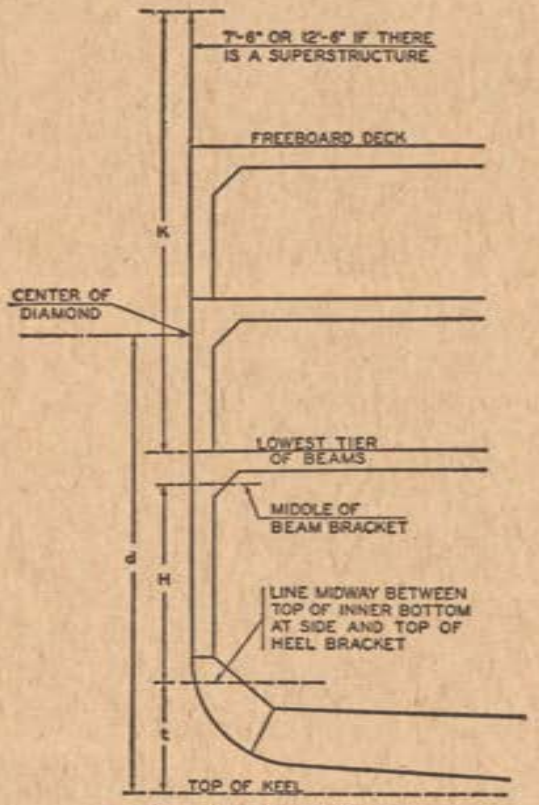


FIGURE 45.15-17 (c) (7) (i)

(ii) This formula applies where D is between 15 feet and 60 feet, both inclusive;

B is between $\frac{L}{10}+5$ and $\frac{L}{10}+20$, both inclusive;

$\frac{L}{Ds}$ is between 10 and 13.5, both inclusive; and the horizontal distance from the outside of the frame to the center of the first row of pillars does not exceed 20 feet.

(iii) In single-deck vessels of ordinary form, where H does not exceed 18 feet, the frame modulus determined by the preceding method is multiplied by the factor f_3 where

$$f_3=0.50+0.05\ (H-8)$$

(iv) Where the horizontal distance from the outside of the frame to the center of the first row of pillars exceeds 20 feet, the assigning authority is to be satisfied that sufficient additional strength is provided.

§ 45.15–20 Height of superstructure.

(a) The height of a superstructure is the least vertical height measured from the top of the superstructure deck to the top of the freeboard deck beam minus the difference between D and the molded depth. (See §§ 45.15–7, 45.15–10.)

§ 45.15–25 Standard height of superstructure.

(a) The standard height of a raised quarter-deck is 3 feet for vessels up to and including 100 feet in length, 4 feet for vessels 250 feet in length, and 6 feet for vessels 400 feet in length and above. The standard height of any other superstructure is 6 feet for vessels up to and including 250 feet in length and 7 feet 6 inches for vessels 400 feet in length and above. The standard height at intermediate lengths is obtained by interpolation.

§ 45.15–27 Length of superstructure (S).

(a) The length of a superstructure is the mean covered length of the parts of the superstructure which extend to the sides of the vessel and lie within lines drawn perpendicular to the extremities of the summer load waterline, as defined in § 45.15–1.

§ 45.15–30 Enclosed superstructure.

(a) A detached superstructure is regarded as enclosed only where:

(1) The enclosing bulkheads are of efficient construction. (See § 45.15–35.)

(2) The access openings in these bulkheads are fitted with class 1 or class 2 closing appliances. (See §§ 45.15–37, 45.15–40.)

(3) All other openings in sides or ends of the superstructure are fitted with efficient weathertight means of closing.

(4) Independent means of access to crew, machinery, bunker, and other working spaces within bridges and poops are at all times available when the bulkhead openings are closed.

§ 45.15–35 Superstructure bulkheads.

(a) Bulkheads at exposed ends of poops, bridges, and forecastles are deemed to be of efficient construction where the assigning authority is satisfied that, in the circumstances, they are equivalent to the following standard for vessels with minimum freeboards under which standard the stiffeners and plating are of the scantlings given in Table 45.15–35(a), the stiffeners are spaced 30 inches apart, the stiffeners on poop and bridge front bulkheads have efficient end connections, and those on after bulkheads of bridges and forecastles extend for the whole distance between the margin angles of the bulkheads.

TABLE 45.15-35 (a)—EXPOSED BULKHEADS OF SUPERSTRUCTURES OF STANDARD HEIGHT [1]

Bridge front bulkheads, unprotected bulkheads of poops 0.4L or more in length		Bulkheads of poops partially protected or less in length than 0.4L		After bulkheads of bridges and forecastles	
Length of vessel (feet)	Bulb angle stiffeners (inches)	Length of vessel (feet)	Plain angle stiffeners (inches)	Length of vessel (feet)	Plain angle stiffeners (inches)
Under 160	5½ x 3 x 0.32.	Under 150	8 x 2½ x 5/16.	Under 150	2¾ x 2¾ x ¼.
160	6 x 3 x 0.34.	150	3½ x 2½ x 5/16.	150	3½ x 2½ x ¼.
200	7 x 3 x 0.32.	200	4 x 3 x 5/16.	250	3½ x 3 x 5/16.
240	7 x 3 x 0.38.	250	5 x 3 x 5/16.	350 and above	4 x 3 x 5/16.
280	7 x 3 x 0.44.	300	5 x 3 x 3/8.		
320	8 x 3 x 0.40.	350	6 x 3½ x 3/8.		
360	8 x 3 x 0.46.	400	6 x 3½ x 7/16.		
400	9 x 3½ x 0.38.	450	7 x 3½ x 7/16.		
440	9 x 3½ x 0.50.	500 and above	7 x 3½ x ½.		
480	10 x 3½ x 0.40.				
520	10 x 3½ x 0.52.				
560 and above	10 x 3½ x 0.64.				

Length of vessel (feet)	Bulkhead plating (inch)	Length of vessel (feet)	Bulkhead plating (inch)	Length of vessel (feet)	Bulkhead plating (inch)
200 and under	0.3	150 and under	0.24	150 and under	0.20
380 and above	0.44	400 and above	0.38	400 and above	0.30

[1] For vessels intermediate in length the thickness of bulkhead plating is obtained by interpolation.

§ 45.15–37 Class 1 closing appliances.

(a) These appliances are of iron or steel, are in all cases to be permanently and strongly attached to the bulkhead, are framed, stiffened, and fitted so that the whole structure is of equivalent strength to the unpierced bulkhead, and are weathertight when closed. The means for securing these appliances are permanently attached to the bulkhead or to the appliances and the latter are so arranged that they can be closed and secured from both sides of the bulkhead or from the deck above. The sills of the access openings are at least 12 inches above the deck.

§ 45.15–40 Class 2 closing appliances.

(a) These appliances are (1) strongly framed hardwood hinged doors, which are not more than 30 inches wide nor less than 2 inches thick, or (2) shifting boards fitted for the full height of the opening in channels riveted to the bulkhead, the shifting boards being at least 2 inches thick where the width of opening is 30 inches or less, and increased in thickness at the rate of 1 inch for each additional 15 inches of width, or (3) portable plates of equal efficiency.

§ 45.15–45 Temporary closing appliances.

(a) Temporary closing appliances for middle line openings in the deck of an enclosed superstructure consists of: (1) a steel coaming not less than 9 inches in height efficiently riveted to the deck; (2) hatchway covers as required by § 45.10–15, secured by hemp lashings; and (3) hatchway supports as required by §§ 45.10–20, 45.10–25.

§ 45.15–47 Superstructures, general.

(a) Where exposed bulkheads at the ends of poops, bridges, and forecastles are not of efficient construction (see § 45.15–35), they are considered as nonexistent.

(b) Where in the side plating of a superstructure there is an opening not provided with permanent means of closing, the part of the superstructure in way of the opening is regarded as having no effective length.

(c) Where the height of a superstructure is less than the standard its length is reduced in the ratio of the actual to the standard height. Where the height exceeds the standard, no increase is made in the length of the superstructure.

§ 45.15–50 Poop.

(a) Where there is an efficient bulkhead and the access openings are fitted with class 1 closing appliances, the length to the bulkhead is effective. Where the access openings in an efficient bulkhead are fitted with class 2 closing appliances and the length to the bulkhead is 0.5 *L* or less, 100 percent of that length is effective; where the length is 0.7 *L* or more, 90 percent of that length is effective; where the length is between 0.5 *L* and 0.7 *L*, an intermediate percentage of that length is effective; where an allowance is given for an efficient adjacent trunk (see § 45.15–65), 90 percent of the length to the bulkhead is to be taken as effective; 50 percent of the length of an open poop or of an open extension beyond an efficient bulkhead is effective.

CROSS REFERENCE: For class 2 closing appliances, see § 45.15–40.

§ 45.15–55 Raised quarter-deck.

(a) Where there is an efficient intact bulkhead, the length to the bulkhead is effective. Where the bulkhead is not intact, the superstructure is considered as a poop of less than standard height.

§ 45.15–57 Bridge.

(a) Where there is an efficient bulkhead at each end, and the access openings in the bulkheads are fitted with class 1 closing appliances, the length between the bulkheads is effective.

(b) Where the access openings in the forward bulkhead are fitted with class 1 closing appliances and the access openings in the after bulkhead with class 2 closing appliances, the length between the bulkheads is effective; where an allowance is given for an efficient trunk, adjacent to the after bulkhead (see § 45.15–65), 90 percent of the length is effective. Where the access openings in both bulkheads are fitted with class 2 closing appliances, 90 percent of the length between the bulkheads is effective. Where the access openings in the forward bulkhead are fitted with class 1 or class 2 closing appliances and the access openings in the after bulkhead have no closing appliances, 75 percent of the length between the bulkheads is effective. Where the access openings in both bulkheads have no closing appliances, 50 percent of the length is effective; 75 percent of the length of an open extension beyond the after bulkhead and 50 percent of that beyond the forward bulkhead are effective.

CROSS REFERENCE: For class 1 and class 2 closing appliances, see §§ 45.15–37, 45.15–40.

§ 45.15–60 Forecastle.

(a) Where there is an efficient bulkhead and the access openings are fitted with class 1 or class 2 closing appliances, the length to the bulkhead is effective. Where no closing appliances are fitted and the sheer forward of amidships is not less than the standard sheer, 100 per cent of the length of the forecastle forward of 0.1 *L* from the forward perpendicular is effective; where the sheer forward is half the standard sheer or less, 50 percent of that length is effective; and where the sheer forward is intermediate between the standard and half the standard sheer, an intermediate percentage of that length is effective; 50 per cent of the length of an open extension beyond the bulkhead or beyond 0.1 *L* from the forward perpendicular is effective.

CROSS REFERENCE: For class 1 and class 2 closing appliances, see §§ 45.15–37, 45.15–40.

§ 45.15–65 Trunk.

(a) A trunk or similar structure which does not extend to the sides of the vessel is regarded as efficient, *Provided*, That:

(1) The trunk is at least as strong as a superstructure;

(2) The hatchways are in the trunk deck, and comply with the requirements of §§ 45.10–1—45.10–45, and the width of the trunk deck stringer provides a satisfactory gangway and sufficient lateral stiffness;

(3) A permanent working platform fore and aft fitted with guardrails is provided by the trunk deck, or by detached trunks connected to other superstructures by efficient permanent gangways. On tank barges an efficient lifeline may be accepted in lieu of guardrails;

(4) Ventilators are protected by the trunk, by watertight covers, or by equivalent means;

(5) Open rails are fitted on the weather portions of the freeboard deck in way of the trunk for at least half their length;

(6) The machinery casings are protected by the trunk, by a superstructure of standard height, or by a deckhouse of the same height and of equivalent strength.

(b) Where access openings in poop and bridge bulkheads are fitted with class 1 closing appliances, 100 percent of the length of an efficient trunk reduced in the ratio of its mean breadth to *B* is added to the effective length of the superstructures. Where the access openings in these bulkheads are not fitted with class 1 closing appliances 90 percent is added.

(c) The standard height of a trunk is the standard height of a bridge.

(d) Where the height of the trunk is less than the standard height of a bridge, the addition is reduced in the ratio of the actual to the standard height; where the height of hatchway coamings on the trunk deck is less than the standard height of coamings (see § 45.15–10), a reduction from the actual height of trunk is to be made which corresponds to the difference between the actual and the standard height of coamings.

§ 45.15–67 Enclosed superstructure with middle line openings in the deck not provided with permanent means of closing.

(a) Where there is an enclosed superstructure with one or more middle line openings in the deck not provided with permanent means of closing (see §§ 45.10–1—45.10–45), the effective length of the superstructure is determined as follows:

(1) Where efficient temporary closing appliances are not provided for the middle line deck openings (see §§ 45.15–45), or the breadth of opening is 80 percent or more of the breadth B_1 of the superstructure deck at the middle of the opening, the vessel is considered as having an open well in way of each opening, and freeing ports are to be provided in way of this well. The effective length of superstructure between openings is governed by §§ 45.15–50, 45.15–57, 45.15–60.

(2) Where efficient temporary closing appliances are provided for middle line deck openings and the breadth of opening is less than 0.8 B_1, the effective length is governed by §§ 45.15–50, 45.15–57, 45.15–60, except that where access openings in 'tween deck bulkheads are closed

by class 2 closing appliances, they are regarded as being closed by class 1 closing appliances in determining the effective length. The total effective length is obtained by adding to the length determined by subparagraph (a) (1) of this section the difference between this length and the length of the vessel modified in the ratio of

$\frac{B_1-b}{B_1}$ where b=breadth of deck opening

where

$\frac{B_1-b}{B_1}$ is greater than 0.5 it is taken as 0.5.

§ 45.15–70 Deductions for superstructures.

(a) Where the effective length of superstructures is 1.0 L, the deduction from the freeboard is 14 inches at 80 feet length of vessel, 34 inches at 280 feet length, and 42 inches at 400 feet length and above; deductions at intermediate lengths are obtained by interpolation. Where the total effective length of superstructures is less than 1.0 L, the deduction is a percentage obtained from Table 45.15–70 (a).

TABLE 45.15-70 (a)—TOTAL EFFECTIVE LENGTH OF SUPERSTRUCTURE (E)

Superstructures	0	0.1L	0.2L	0.3L	0.4L	0.5L	Line
	Per-cent	Per-cent	Per-cent	Per-cent	Per-cent	Per-cent	
All types with forecastle and without detached bridge	0	5	10	15	23.5	32	A
All types with forecastle and detached bridge [1]	0	6.3	12.7	19	27.5	36	B

Superstructures	0.6L	0.7L	0.8L	0.9L	1.0L	Line
	Per-cent	Per-cent	Per-cent	Per-cent	Per-cent	
All types with forecastle and without detached bridge	46	63	75.3	87.7	100	A
All types with forecastle and detached bridge [1]	46	63	75.3	87.7	100	B

[1] Where the effective length of a detached bridge is less than 0.2L the percentages are obtained by interpolation between lines B and A. Where no forecastle is fitted the above percentages are reduced by 5. Percentages for intermediate lengths of superstructures are obtained by interpolation.

§ 45.15–73 Sheer, general.

(a) The sheer is measured from the deck at side to a line of reference drawn parallel to the keel through the sheer line at amidships.

(b) In vessels designed to trim by the stern in service, the sheer may be measured in relation to the load line, provided an additional mark is placed at 0.25L forward of amidships to indicate the assigned load line. This mark is to be similar to the load line diamond amidships.

(c) In flush deck vessels and in vessels with detached superstructures the sheer is measured at the freeboard deck.

(d) In vessels with topsides of unusual form in which there is a step or break in the topsides, the sheer is considered in relation to the equivalent depth amidships (see § 45.15–10).

(e) In vessels with a superstructure of standard height which extends over the whole length of the freeboard deck, the sheer is measured at the superstructure deck; where the height exceeds the standard, the sheer may be considered in relation to the standard height.

(f) Where a superstructure is intact or access openings in its enclosing bulkheads are fitted with class 1 closing appliances, and the superstructure deck has at least the same sheer as the exposed freeboard deck, the sheer of the enclosed portion of the freeboard deck is not taken into account.

CROSS REFERENCE: For class 1 closing appliances, see § 45.15–37.

§ 45.15–75 Standard sheer profile.

(a) The ordinates (in inches) of the standard sheer profile are given in Table 45.15–75(a) where L is the number of feet in the length of the vessel.

TABLE 45.15-75 (a)

Station [1]	Ordinate	Factor
A. P.	0.1 L+10	1
1/6L from A. P.	0.0445 L+4.45	4
1/3L from A. P.	0.011 L+1.1	2
Amidships	+0	4
1/3L from F. P.	0.022 L+2.2	2
1/6L from F. P.	0.089 L+8.9	4
F. P.	0.2 L+20	1

[1] A. P.=After end of summer load waterline. F. P.=Fore end of summer load waterline.

§ 45.15–77 Measurement of variations from standard sheer profile.

(a) Where the sheer profile differs from the standard, the 7 ordinates of each profile are multiplied by the appropriate factors given in the table of ordinates. The difference between the sums of the respective products, divided by 18, measures the deficiency or excess of sheer. Where the after half of the sheer profile is greater than the standard and the forward half is less than the standard, no credit is allowed for the part in excess and the deficiency only is measured.

(b) Where the forward half of the sheer profile exceeds the standard, and the after portion of the sheer profile is not less than 75 percent of the standard, credit is allowed for the part in excess; where the after part is less than 50 percent of the standard, no credit is given for the excess sheer forward. Where the after sheer is between 50 percent and 75 percent of the standard, intermediate allowances may be granted for excess sheer forward.

§ 45.15–80 Correction for variations from standard sheer profile.

(a) The correction for sheer is the deficiency or excess of sheer (see § 45.15–77) multiplied by $0.75-\frac{S}{2L}$ where S is the total length of the superstructure, as defined in § 45.15–27.

§ 45.15–83 Addition for deficiency in sheer.

(a) Where the sheer is less than the standard, the correction for deficiency in sheer (see § 45.15–80) is added to the freeboard.

§ 45.15–85 Deduction for excess sheer.

(a) Where an enclosed superstructure covers 0.1L before and 0.1L abaft midships, the correction for excess of sheer (see § 45.15–80) is deducted from the freeboard; in vessels with detached superstructures where no enclosed superstructure covers amidships, no deduction is made from the freeboard; where an enclosed superstructure covers less than 0.1L before and 0.1L abaft amidships, the deduction is obtained by interpolation. The maximum deduction for excess sheer is 1½ inches at 100 feet and increases at the rate of 1½ inches for each additional 100 feet in the length of the vessel.

§ 45.15–87 Standard round of beam.

(a) The standard round of beam of the freeboard deck is one-fiftieth of the breadth of the vessel.

§ 45.15–90 Round of beam correction.

(a) Where the round of beam of the freeboard deck is greater or less than the standard, the freeboard is decreased or increased respectively by one-fourth of the difference between the actual and the standard round of beam, multiplied by the proportion of the length of the freeboard deck not covered by enclosed superstructures. Twice the standard round of beam is the maximum for which allowance is given.

§ 45.15–93 Summer freeboard.

(a) The minimum freeboard in summer is the freeboard derived from the freeboard table after corrections for departures from the standards and after deduction for superstructures. The freeboard measured from the intersection of the upper surface of the freeboard deck with the outer surface of the shell is not to be less than 2 inches.

§ 45.15–94 Midsummer freeboard.

(a) In the case of cargo vessels and tankers which comply fully with the provisions of § 45.15–17 as to strength of structure at the deeper draft, the Assigning Authority may permit a reduction in the freeboard for the midsummer season of an amount in inches not exceeding the product of 0.3 multiplied by the summer draft in feet, measured from the top of the keel to the center of the diamond. However, in no case shall the freeboard be less than 2 inches.

§ 45.15–95 Intermediate and winter freeboard.

(a) The minimum freeboards for the intermediate and winter seasons is obtained by an addition to the summer freeboard of a distance in inches obtained by multiplying the factors given in Table 45.15–95 (a) by the summer draft in feet measured from the top of the keel to the center of the diamond.

TABLE 45.15-95 (a)

Length between perpendiculars [1]	Factor for intermediate season	Factor for winter season
Under 400 feet	0.25	0.50
450 feet	.25	.65
500 feet	.35	.80
550 feet and above	.45	1.00

[1] Factors for intermediate lengths to be obtained by interpolation.

§ 45.15–96 Salt water freeboard.

(a) In the case of ships which load in salt water and proceed to fresh water, the minimum freeboards while in salt water for all seasons shall be increased by an amount equal to

$$\frac{\Delta}{4T} \text{ inches,}$$

where:

Δ = displacement in fresh water, in tons of 2,240 pounds at the summer load waterline;

T = tons of 2,240 pounds per inch immersion in fresh water at the summer load waterline.

(1) Where the displacement at the summer load waterline cannot be certified, the increase in freeboard shall be one-fourth of an inch per foot of summer draft measured from the top of the keel.

§ 45.15–97 Freeboard table for steamers.

(a) Table 45.15–97(a) gives the basic minimum summer freeboard for steamers which comply with the standards in this part.

TABLE 45.15-97(a)—BASIC MINIMUM SUMMER FREEBOARD FOR STEAMERS

L (feet)	Freeboard (inches)	L (feet)	Freeboard (inches)	L (feet)	Freeboard (inches)
80	7.2	310	42.2	540	107.4
90	8.0	320	44.0	550	110.0
100	8.9	330	47.0	560	112.6
110	9.9	340	49.5	570	115.1
120	11.0	350	52.1	580	117.6
130	12.1	360	54.8	590	120.0
140	13.3	370	57.6	600	122.3
150	14.5	380	60.5	610	124.5
160	15.7	390	63.4	620	126.7
170	17.1	400	66.4	630	128.8
180	18.5	410	69.4	640	130.8
190	19.9	420	72.4	650	132.8
200	21.4	430	75.4	660	134.7
210	23.0	440	78.5	670	136.7
220	24.6	450	81.5	680	138.7
230	26.3	460	84.5	690	140.7
240	28.1	470	87.5	700	142.6
250	29.9	480	90.5	710	144.6
260	31.8	490	93.4	720	146.5
270	33.8	500	96.3	730	148.4
280	35.8	510	99.1	740	150.3
290	37.8	520	101.9	750	152.1
300	40.0	530	104.7		

(b) The freeboards at intermediate lengths are obtained by interpolation.

(c) Where c exceeds 0.68, the freeboard is multiplied by the factor

$$\frac{c+0.68}{1.36}$$

(d) Where D exceeds or is less than $\frac{L}{15}$ the freeboard is increased or decreased accordingly, by $\left(D-\frac{L}{15}\right)R$ inches, where R is $\frac{L}{130}$ at lengths less than 390 feet, and 3 at 390 feet length and above, except that the depth to be used in the above correction is not to be taken at less than $L/15$ in vessels below 350 feet in length, nor less than those given in Table 45.15–97 (d), for lengths 350 feet and above. Minimum depths at intermediate lengths are obtained by interpolation.

TABLE 45.15-97 (d)

L	Minimum depth	L	Minimum depth	L	Minimum depth
350	23.35	450	27.65	550	30.20
375	24.70	475	28.40	575	30.70
400	25.80	500	29.05	600	31.15
425	26.80	525	29.65	625	31.60

(1) *Provided, however,* a vessel with an enclosed superstructure covering at least 0.6 L amidships, with a complete trunk, or with a combination of intact partial superstructures and trunk which extends all fore and aft, where D is less than $L/15$, the freeboard is reduced at the above rate. Where the height of superstructures or trunk is less than the standard height, the reduction is in the ratio of the actual to the standard height.

(e) Where the actual depth to the surface of the freeboard deck amidships is greater or less than D, the difference between the depths (in inches) is added to or deducted from the freeboard.

Subpart 45.20—Load Lines for Tankers [2]

§ 45.20–1 Definition.

(a) The term "tanker" includes all steamers specially constructed for the carriage of liquid cargoes in bulk.

§ 45.20–5 Marks on sides.

(a) The marks on the tanker's sides are to be as shown in Figure 45.05–5(a) and the lines as described in § 45.05–15.

§ 45.20–10 Construction.

(a) The structure of the vessel is to be of sufficient strength for the increased draft corresponding to the freeboard assigned.

§ 45.20–15 Forecastle.

(a) The vessel is to have a forecastle of which the length is not less than 7 percent of the length of the vessel and the height is not less than the standard height.

[2] The provisions of §§ 45.01–1—45.01–90, inclusive, and §§ 45.05–1—45.15–97, inclusive, shall apply to Great Lakes tankers except as they are modified by §§ 45.20–1—45.20–70, inclusive.

(b) A forecastle is not required in the case of self-propelled barges, tank barges, and cargo barges carrying cargo only on deck.

§ 45.20–20 Machinery casings.

(a) The openings in machinery casings on the freeboard deck are to be fitted with steel doors. The casings are to be protected by an enclosed poop or bridge of at least standard height, or by a deckhouse of equal height and of equivalent strength. These conditions may be modified in the case of self-propelled barges. The bulkheads at the ends of these structures are to be of the scantlings required for bridge front bulkheads. All entrances to the structures from the freeboard deck are to be fitted with effective closing appliances, and the sills are to be at least 18 inches above the deck. Exposed machinery casings on the superstructure deck are to be of substantial construction, and all openings in them are to be fitted with steel closing appliances permanently attached to the casings and capable of being closed and secured from both sides; the sills of such openings are to be at least 15 inches above the deck. Fiddley openings are to be as high above the superstructure deck as is reasonable and practicable and are to have strong steel covers permanently attached in their proper positions. Engineroom skylights are to be of substantial construction, fitted with strong glass lights, which may be required to be fitted with steel covers depending on their height above the freeboard deck.

§ 45.20–25 Gangway.

(a) An efficiently constructed permanent gangway of sufficient strength for its exposed position is to be fitted fore and aft at the level of the superstructure deck between the poop and midship bridge, and when crew are berthed forward from the bridge to the forecastle, or other equivalent means of access may be provided to carry out the purpose of the gangway, such as passage below deck.

(b) On towed tank barges a wire cable arranged and equipped to facilitate safe communication between both ends of the vessel at all times may be accepted in lieu of a permanent gangway.

§ 45.20–30 Protection of crew, access to machinery space, etc.

(a) Safe and satisfactory access from the gangway level to the quarters of the crew, the machinery space, and all other parts used in the necessary work of the vessel is to be available at all times. This section does not apply to pumprooms entered from the freeboard deck, when fitted with class 1 closing appliances. Deckhouses for the accommodation of the crew, pilothouses, etc., on the freeboard deck are to be of steel efficiently constructed and provided with port lights fitted with steel deadlights.

§ 45.20–35 Hatchways.

(a) All hatchways on the freeboard deck and on the deck of expansion trunks are to be closed watertight by efficient steel covers.

§ 45.20–40 Ventilators.

(a) Ventilators to spaces below the freeboard deck are to be of ample strength or are to be protected by superstructures or equally efficient means.

§ 45.20–45 Freeing arrangements.

(a) Vessels with bulwarks are to have open rails fitted for at least half the length of the exposed portion of the weather deck or other effective freeing arrangements. The upper edge of the sheer strake is to be kept as low as practicable and preferably not higher than the upper edge of the gunwale bar.

(b) Where superstructures are connected by trunks, open rails are to be fitted for the whole length of the weather portions of the freeboard deck.

§ 45.20–50 Plans.

(a) Plans showing proposed fittings and arrangements are to be submitted to the assigning authority for approval.

§ 45.20–55 Computation of freeboard.

(a) When the assigning authority is satisfied that the foregoing requirements are fulfilled, the summer freeboard may be computed from the table for tankers; all corrections, except those for flush-deck steamers, detached superstructures, and excess sheer, are to be made in accordance with §§ 45.15–1—45.20–1.

§ 45.20–60 Deductions for detached superstructures.

(a) When the total effective length of superstructure is less than 1.0 *L*, the deduction is a percentage of that for a superstructure of length 1.0 *L*, and is obtained from Table 45.20–60 (a).

TABLE 45.20–60 (a)—TOTAL EFFECTIVE LENGTH OF SUPERSTRUCTURES

	0	0.1*L*	0.2*L*	0.3*L*	0.4*L*	0.5*L*	0.6*L*	0.7*L*	0.8*L*	0.9*L*	1.0*L*
	Percent	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*
All types	0	7	14	21	31	41	52	63	75.3	87.7	100

§ 45.20–65 Deduction for excess sheer.

(a) Where the sheer is greater than the standard, the correction for excess sheer (see § 45.15–80) is deducted from the freeboard for all tankers. Section 45.15–85 does not apply except that the maximum deduction for excess sheer is 1½ inches at 100 feet and increases at the rate of 1½ inches for each additional 100 feet in the length of the vessel.

§ 45.20–70 Freeboard table for tankers.

(a) Table 45.20–70 (a) gives the basic minimum summer freeboard for tankers which comply with the standards in this part.

TABLE 45.20–70 (a)—BASIC MINIMUM SUMMER FREEBOARD FOR TANKERS

L (feet)	Freeboard	*L* (feet)	Freeboard	*L* (feet)	Freeboard
	Inches		*Inches*		*Inches*
80	6.4	220	22.8	360	48.5
90	7.2	230	24.3	370	50.6
100	8.1	240	25.9	380	52.7
110	9.1	250	27.5	390	54.9
120	10.1	260	29.2	400	57.1
130	11.1	270	30.9	410	59.4
140	12.2	280	32.7	420	61.7
150	13.3	290	34.5	430	64.1
160	14.5	300	36.4	440	66.5
170	15.8	310	38.3	450	69.0
180	17.1	320	40.2	460	71.5
190	18.5	330	42.2	(1)	(1)
200	19.9	340	44.3		
210	21.3	350	46.4		

[1] Tankers above 460 feet in length to be specially considered, and the assigned freeboards are to be approved by the Commandant, U. S. Coast Guard, before issuance of certificate.

Subpart 45.25—Fees and Form of Certificate

§ 45.25–1 Fees.

(a) Fees payable by owners will be charged for the assignment of load line, renewal of load line certificates, and annual load line inspection, in accordance with the regulations set forth in § 43.40–5 of this subchapter.

§ 45.25–5 Form of load line certificate.

LOAD LINE CERTIFICATE FOR THE GREAT LAKES

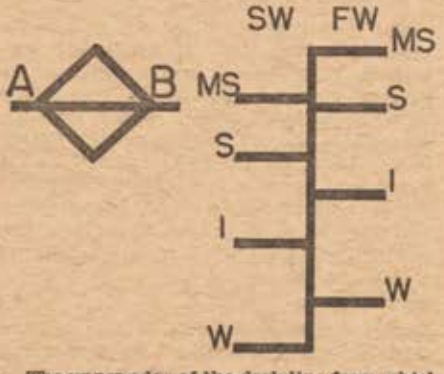
[SEAL]

Issued under the authority of the Commandant, U.S. Coast Guard, United States of America, under the provisions of the act of August 27, 1935, as amended, to establish load lines for American merchant vessels of 150 gross tons or over engaged in trade on the Great Lakes of North America.

Ship _____
Certificate No. _____
Official No. _____
Gross tonnage _____
Port of registry _____

FREEBOARD FROM DECK LINE		LOAD LINE
Midsummer _____	MS	_____ above S
Summer _____	S	Upper edge of line through center of diamond.
Intermediate _____	I	_____ below S
Winter _____	W	_____ below S

Increase for salt water for all freeboards _____ inches.



The upper edge of the deck line from which these freeboards are measured is _____ inches above the top of the _____ deck at side.

This is to certify that this ship has been surveyed and the freeboards and load lines shown above have been found to be correctly marked upon the vessel in manner and location as provided by the load line regulations of the Commandant, U.S. Coast Guard, applicable to the Great Lakes.

This certificate[1] remains in force until _____ Issued at _____ on the _____ day of _____ 19__. (Here follows the signature, seal, if any, and the name of the authority issuing the certificate.)

NOTES: (1) In accordance with the Great Lakes Load Line Regulations the diamond and lines must be permanently marked by center punch marks or cutting. The "MS" load line shall be assigned only to those particular vessels that qualify under the regulations.

(2) The "SW" marks need only be assigned to Great Lakes vessels loading in salt water of the St. Lawrence River west of a straight line from Cap de Rosiers to West Point Anticosti Island, and west of a line along longitude 63 degrees west from Anticosti Island to the north shore of the St. Lawrence River. In such cases these limits shall be indicated on the certificate.

(3) The load line assignment given by this certificate necessarily assumes that the nature and stowage of cargo, ballast, etc., are such as to secure sufficient stability for the vessel. Accordingly, it is the owner's responsibility to furnish the Master of the vessel with stability information and instructions when this is necessary to maintenance of sufficient stability.

(On the reverse side of the load line certificate, or on a separate sheet attached and forming part of the certificate, provision is to be made for annual inspection and renewal endorsements.)

[1] Upon the expiration of the certificate, renewal must be obtained as provided by the Great Lakes Load Line Regulations and the certificate so endorsed.

PART 46—SUBDIVISION LOAD LINES FOR PASSENGER VESSELS

Subpart 46.01—Authority and Purpose

Sec.
46.01–1 Purpose.
46.01–5 Authority.
46.01–10 Responsibility for administration.
46.01–15 Application of regulations.
46.01–20 Penalties for violations.

Subpart 46.05—Definitions Used in This Part

46.05–1 Passenger vessel.
46.05–10 Foreign voyage.
46.05–15 Coastwise voyages.
46.05–20 Great Lakes voyage.
46.05–25 New passenger vessel.
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Subpart 46.10—Administration

46.10–1 Relaxation from regulations.
46.10–5 Load line requirements for subdivision.
46.10–10 Marks to indicate subdivision load lines.
46.10–15 Survey for the establishment and renewal of subdivision load line marks.
46.10–20 Application for the assignment and renewal of subdivision load lines.
46.10–25 Equivalents.
46.10–30 Subdivision load line certificates.
46.10–35 Validity of subdivision load line certificates.
46.10–40 Nonsubmergence subdivision load line (Great Lakes).
46.10–45 Nonsubmergence subdivision load lines in salt water.
46.10–50 Drills and inspections.
46.10–55 Logbook entries.

Sec.
46.10-60 Control.
46.10-65 Construction.
46.10-70 Plans and inspections of new and converted vessels.

Subpart 46.15—Subdivision Load Lines for Passenger Vessels Engaged in Foreign, Coastwise, and Great Lakes Voyages

46.15-1 Procedure for determination of subdivision load line.
46.15-5 Engineering requirements.
46.15-10 Subdivision load lines.

AUTHORITY: The provisions of this Part 46 issued under sec. 2, 45 Stat. 1493, as amended, sec. 2, 49 Stat. 888, as amended; 46 U.S.C. 85a, 88a. Interpret or apply R.S. 4490, as amended, sec. 3, 24 Stat. 129, as amended, 41 Stat. 305, as amended, sec. 5, 49 Stat. 1384, as amended, secs. 1, 2, 49 Stat. 1544, 1545, as amended, sec. 3, 54 Stat. 347, as amended, sec. 3, 68 Stat. 675; 46 U.S.C. 482, 483, 363, 369, 367, 1333, 50 U.S.C. 198; E.O. 11239, July 31, 1965, 30 F.R. 9671, 3 CFR, 1965 Supp. Treasury Department Orders 120, July 31, 1950, 15 F.R. 6521; 167-14, Nov. 26, 1954, 19 F.R. 8026; 167-48, Oct. 19, 1962, 27 F.R. 10504.

Subpart 46.01—Authority and Purpose

§ 46.01-1 Purpose.

(a) The purpose of the regulations in this part is to set forth uniform minimum requirements applicable to passenger vessels required to have subdivision load lines. These requirements deal with the following:

(1) Load line requirements applicable before a passenger vessel will be marked with and certificated as to subdivision load lines.

(2) Assigning, marking, and recording of subdivision load lines.

(3) Administration of subdivision load lines.

(4) Application of requirements to passenger vessels.

§ 46.01-5 Authority.

(a) The regulations regarding subdivision and subdivision load lines interpret or apply Title 46, U.S. Code, sections 85a, 88a, 363, 367, 369, 482, 483, and 1333, and Title 50, U.S. Code, section 198.

(b) The International Load Line Convention, 1930, and the applicable International Convention for Safety of Life at Sea, also establish minimum requirements for load lines and subdivision.

§ 46.01-10 Responsibility for administration.

(a) Under the general direction and supervision of the Secretary of the Treasury, the Commandant of the United States Coast Guard is delegated the responsibility and authority for the administration of load line requirements and to determine the position and to assure the correct marking of subdivision load lines on all passenger vessels subject to the applicable International Convention for Safety of Life at Sea, or the Act of March 2, 1929, as amended (46 U.S.C. 85-85g), or the Coastwise Load Line Act, 1935, as amended (46 U.S.C. 88-88i).

§ 46.01-15 Application of regulations.

(a) The regulations in this part establish subdivision load lines required on passenger vessels engaged in foreign voyages, as well as on passenger vessels of 150 gross tons or over engaged in coastwise or Great Lakes voyages.

(b) When engaged in voyages subject to this part, no passenger vessel required to be marked with subdivision load lines shall depart from or arrive at any port or place under the jurisdiction of the United States, nor shall such United States vessel operate on the high seas nor the Great Lakes, unless such vessel has been marked with subdivision load lines in accordance with the regulations in this part, has on board a valid certificate certifying to the correctness of the location of such subdivision load line marks, and is otherwise in compliance with the applicable requirements of law and regulations in this part.

(c) No passenger vessel of the United States of 150 gross tons or over and subject to the Coastwise Load Line Act, 1935, as amended, shall engage in coastwise voyages or voyages on the Great Lakes unless such vessel has been marked with subdivision load lines in accordance with the regulations in this part and has on board a valid certificate certifying to the correctness of the location of such subdivision load line marks.

(d) No foreign passenger vessel belonging to a country that has ratified or acceded to the applicable International Convention for Safety of Life at Sea shall arrive or depart from any port or place under the jurisdiction of the United States, and no foreign passenger vessel of 150 gross tons or over subject to the Act of March 2, 1929, as amended (46 U.S.C. 85-85g), or the Coastwise Load Line Act, 1935, as amended (46 U.S.C. 88-88i), shall arrive or depart from any port or place under the jurisdiction of the United States, including ports on the Great Lakes, unless such passenger vessel has been marked with subdivision load lines in accordance with the regulations in this part and has on board a valid certificate certifying to the correctness of the location of such subdivision load line marks.

(e) Subdivision load lines shall be marked on both sides of passenger vessels where determined and in a manner described in Subpart 46.15 as applicable to the vessel's service. The subdivision load line certificates shall be in accordance with §§ 46.10-30 and 46.10-35.

§ 46.01-20 Penalties for violations.

(a) Penalties for violations of the regulations in this part by passenger vessels of the United States engaged in foreign voyages shall be in accordance with those laws which require the inspection and certification of the vessel. In addition, for passenger vessels of 150 gross tons or over and subject to either the Act of March 2, 1929, as amended (46 U.S.C. 85-85g), or the Coastwise Load Line Act, 1935, as amended (46 U.S.C. 88-88i), which engage in voyages described in § 43.01-1 or 45.01-1, the penalties for violations of the regulations in this part shall be those set forth in the load line act applicable to the vessel.

(b) For a further description of the actions which may be taken see § 43.01-13 of this subchapter. The procedures governing the assessment, collection, remission and mitigation of any monetary penalty imposed for a violation of a law or the regulations prescribed thereunder in this part, as well as the appeal procedures followed, are in Subpart 2.50 of Part 2 of Subchapter A (Procedures Applicable to the Public) of this chapter.

Subpart 46.05—Definitions Used in This Part

§ 46.05-1 Passenger vessel.

(a) For the purpose of the regulations in this part, a vessel is a passenger vessel if:

(1) Engaged on an international voyage by sea, it carries or is authorized to carry more than 12 passengers; or,

(2) Engaged on a coastwise voyage by sea or a voyage on the Great Lakes, it carries or is authorized to carry more than 16 persons in addition to the crew.

§ 46.05-10 Foreign voyage.

(a) A foreign voyage for the purpose of marking passenger vessels with subdivision load lines is a voyage by sea between a port under the jurisdiction of the United States and a port of a foreign country, its colonies, territories, or protectorates, or conversely (a voyage exclusively on the Great Lakes excepted).

§ 46.05-15 Coastwise voyages.

(a) A coastwise voyage by sea, for the purpose of marking passenger vessels with subdivision load lines, is a voyage in which a vessel in the usual course of her employment proceeds from one port or place in the United States to another port or place in the United States or from a port or place in a possession to another port or place in the same possession, and passes outside the line dividing inland waters from the high seas (a voyage exclusively on the Great Lakes excepted), as well as a voyage in which a vessel proceeds from a port or place in the United States or her possessions and passes outside the line dividing inland waters from the high seas and navigates on the high seas, and then returns to the same port or place.

§ 46.05-20 Great Lakes voyage.

A Great Lakes voyage is any voyage from a United States port or place on the Great Lakes to another United States port or place on the Great Lakes or to a Canadian port or place on the Great Lakes, or conversely.

§ 46.05-25 New passenger vessel.

A new passenger vessel is a vessel whose keel was laid or was a vessel converted into a passenger vessel on or after November 19, 1952.

§ 46.05-30 Existing passenger vessel.

An existing passenger vessel in respect to its voyage is any passenger vessel that is not a new passenger vessel as defined in § 46.05-25.

Subpart 46.10—Administration

§ 46.10–1 Relaxation from regulations.

(a) New passenger vessels making foreign voyages by sea shall comply with the requirements in this part. An existing passenger vessel engaged in foreign voyages by sea may be permitted relaxation from the requirements of this part if, in the opinion of the Commandant, U. S. Coast Guard, such requirements are unreasonable or impracticable.

(b) A new passenger vessel making coastwise voyages by sea or making Great Lakes voyages shall comply with the requirements in this part. An existing passenger vessel making coastwise voyages by sea or Great Lakes voyages may be permitted relaxation from the requirements of this part if, in the opinion of the Commandant, U. S., Coast Guard, such requirements are unreasonable or impracticable.

§ 46.10–5 Load line requirements for subdivision.

(a) The load line requirements of Parts 43, 44, 45 of this subchapter as applicable to the passenger vessel and her service, shall be complied with before a passenger vessel will be marked with and certificated as to subdivision load lines.

§ 46.10–10 Marks to indicate subdivision load lines.

(a) Marks to indicate the maximum mean draft to which a passenger vessel may be lawfully submerged shall be permanently marked on each side of the passenger vessel in the form, manner, and location provided in this part.

(b) The Commandant, U.S. Coast Guard, shall determine the position of the subdivision load lines by the application of the requirements contained in this part and Parts 73 and 74 of Subchapter H (Passenger Vessels) of this chapter. The correct marking of subdivision load lines on passenger vessels shall be certified to by the American Bureau of Shipping as a classification society approved by the Commandant for such purpose.

(c) Certificates certifying to the correctness of subdivision load line marks shall not be furnished until it is determined that the marks have been correctly placed upon the passenger vessel.

(d) In the case of passenger vessels that are required by the International Convention for Safety of Life at Sea to have on board a safety certificate, the certification of subdivision load line marks shall be made by letter to the Commandant, U. S. Coast Guard, Washington, D.C., 20226.

§ 46.10–15 Survey for the establishment and renewal of subdivision load line marks.

(a) Every passenger vessel to be marked with and certificated for subdivision load lines must comply with the requirements as set forth in Subchapter H (Passenger Vessels) of this chapter for ocean, coastwise, and Great Lakes service as applicable to the particular vessel and the service in which she is to be employed.

(b) Every passenger vessel marked with a subdivision load line shall be subjected to the surveys specified in this paragraph. The details of the surveys or inspections indicated in subparagraphs (1) through (3) of this paragraph shall be as set forth in the applicable sections of Part 71 of Subchapter H (Passenger Vessels) of this chapter.

(1) A survey before the vessel is put in service.

(2) A periodical survey once every 12 months.

(3) Additional surveys as occasion arises.

(4) Surveys required by Parts 43, 44, or 45 of this subchapter.

§ 46.10–20 Application for the assignment and renewal of subdivision load lines.

(a) Application for assignment and renewal of subdivision load lines and certification thereof shall be made in writing to the Commandant, U.S. Coast Guard, Washington, D.C., 20226.

§ 46.10–25 Equivalents.

(a) Where in the regulations in this part it is provided that a particular fitting, appliance, apparatus, or type thereof, shall be fitted or carried in a vessel engaged on foreign voyages by sea or that any particular arrangement shall be adopted, there may be substituted any other fitting or appliance or type thereof or any other arrangement provided that the Commandant, U.S. Coast Guard, shall have been satisfied by suitable trials that the fitting, appliance, or apparatus, or type thereof, or that the arrangement substituted is at least as effective as that specified in this part.

(b) Where, in the application of the regulations in this part to passenger vessels engaged in coastwise voyages by sea and on Great Lakes voyages, it is desired to substitute other construction, arrangement, fitting, or appliance, or type thereof, such substitution may be made if approved by the Commandant, U. S. Coast Guard, provided the degree of safety provided by this part is obtained.

§ 46.10–30 Subdivision load line certificates.

(a) Passenger vessels engaged in foreign voyages by sea shall have their subdivision load lines certificated on the safety certificate required by the International Convention for Safety of Life at Sea, 1948. Safety certificates shall be issued by the Commandant, U. S. Coast Guard, Washington, D.C., 20226, for a period not to exceed one year. These vessels will also be provided with the load line certificate required by Part 43 of this subchapter, the minimum freeboard shown thereon to be not less than the minimum freeboard corresponding to the principal passenger condition. The fact that they are subdivision load lines is to be noted on the load line certificate.

(b) Passenger vessels engaged on coastwise voyages by sea or Great Lakes voyages shall have the position of their subdivision load lines recorded on a load line certificate in the form required by Parts 43 or 45 of this subchapter. The fact that they are subdivision load lines is to be noted on the load line certificate.

(c) A note shall be added to the load line certificate below the signature of the assigning authority in the following form:

> The bulkhead deck used for determining the position of the subdivision load lines certified above is _____ (here described bulkhead deck).

(d) Annual inspections of passenger vessels shall be as required by §§ 43.01–55 and 46.10–15 of this subchapter and renewal of passenger vessels' load line certificates shall be as required by § 43.01–75.

(e) Each new passenger vessel which receives its first load line certificate shall also be provided with a copy of the load line survey report as required by §§ 43.01–40 or 45.01–30 of this subchapter.

§ 46.10–35 Validity of subdivision load line certificates.

(a) Subdivision load line certificates issued to passenger vessels shall only be valid during the time for which the certificates are issued.

(b) If, due to any cause, the conditions as required by this part are changed, or the regulations in this part are not carried out, the load line certificate may be cancelled and the load lines considered nonexistent: *Provided*, That if the conditions causing the cancellation of the certificate are satisfactorily corrected, the load line certificate shall be reinstated for the remainder of its term.

(c) A valid subdivision load line certificate for foreign voyages by sea shall be valid for coastwise voyages by sea and Great Lakes voyages. A valid subdivision load line certificate for coastwise voyages by sea shall be valid for Great Lakes voyages but not for foreign voyages by sea. A valid subdivision load line certificate for Great Lakes voyages shall not be valid for foreign or coastwise voyages by sea.

§ 46.10–40 Nonsubmergence subdivision load line (Great Lakes).

(a) Passenger vessels on the Great Lakes of 150 gross tons or over shall not submerge the subdivision load line applicable to the voyage.

§ 46.10–45 Nonsubmergence subdivision load lines in salt water.

(a) Passenger vessels required to be marked with subdivision load lines, engaged on foreign and coastwise voyages other than the Great Lakes voyages, shall not submerge in salt water the subdivision load line applicable to the voyage. Passenger vessels engaged on ocean foreign or coastwise voyages may be marked with fresh water load lines. A passenger vessel on foreign or coastwise voyages (except Great Lakes voyages) may have an allowance made for the degree of brackishness of the water in which the vessel is floating but not for the weight of fuel, water, etc., required for consumption between the point of departure and the open sea, and no allowance is to be made for bilge or ballast

water that may be in the passenger vessel at the time of departure.

§ 46.10–50 Drills and inspections.

(a) For the required drills and inspections to be conducted on passenger vessels, see Subpart 78.17 of Subchapter H (Passenger Vessels) of this chapter.

§ 46.10–55 Log book entries.

(a) For required logbook entries to be made on passenger vessels, see Subpart 78.17 of Subchapter H (Passenger Vessels) of this chapter.

§ 46.10–60 Control.

(a) The Collector of Customs or the Coast Guard District Commander may detain a passenger vessel for a survey if there is reason to believe that such a vessel is proceeding on her journey in excess of the draft allowed by the regulations in this part as indicated by the vessel's load lines certified on the safety certificate, load line certificate, or otherwise. The Coast Guard District Commander may detain a passenger vessel if it is so loaded as to be manifestly unsafe to proceed to sea.

(b) When passenger vessels are subject to the Act of March 2, 1929 (46 U.S.C. 85–85g), the duties and responsibilities of the Collector of Customs or the Coast Guard District Commander and the procedures followed shall be the same as those stated in § 43.01–97 of this chapter.

(c) When passenger vessels are subject to the Coastwise Load Line Act, 1935, as amended (46 U.S.C. 88–88l), the duties and responsibilities of the Collector of Customs or the Coast Guard District Commander and the procedures followed shall be the same as those stated in § 43.01–97 or 45.01–85 of this subchapter, as applicable.

§ 46.10–65 Construction.

(a) The watertight subdivision of every passenger vessel shall be as efficient as possible, having regard to its intended service. This principle is given effect by the requirements of Part 73 of Subchapter H (Passenger Vessels) of this chapter which provide for variations in the standard of subdivision according to the length of the vessel and the degree to which the vessel approaches the exclusive passenger type, the highest standard being required in vessels of the greatest length engaged primarily in the carriage of passengers.

(b) Passenger vessels engaged in foreign voyages by sea or coastwise voyages by sea or voyages on the Great Lakes, to be marked with subdivision load lines shall comply with the requirements in this part.

§ 46.10–70 Plans and inspections of new and converted vessels.

(a) Plans for a new passenger vessel or a vessel to be converted to a passenger vessel shall be submitted to the Commandant as required by Subpart 71.65 of Subchapter H (Passenger Vessels) of this chapter.

(b) Inspections shall be made during the construction or conversion of the vessel as required by Subpart 71.20 of Subchapter H (Passenger Vessels) of this chapter.

(c) Upon completion of the construction or conversion of a passenger vessel, a stability test shall be performed and stability information shall be supplied to the operator as required by Part 74 of Subchapter H (Passenger Vessels) of this chapter.

Subpart 46.15—Subdivision Load Lines for Passenger Vessels Engaged in Foreign, Coastwise, and Great Lakes Voyages

§ 46.15–1 Procedure for determination of subdivision load line.

(a) The procedure for the determination of the subdivision load line as well as special construction features of the vessel shall be as set forth in Subpart 72.01 and Parts 73 and 74 of Subchapter H (Passenger Vessels) of this chapter.

§ 46.15–5 Engineering requirements.

(a) Bilge and ballast systems, piping, inlets and discharges, ash chutes, astern power, and auxiliary steering shall be in accordance with the provisions of Subchapter F (Marine Engineering) of this chapter.

§ 46.15–10 Subdivision load lines.

(a) Subdivision load lines shall be located by measuring vertically down from the deck line required by Part 43 of this subchapter.

(b) The length, width, and manner of marking the lines shall be as provided in Subpart 43.05 of this subchapter.

(c) No subdivision load line is to be placed so that the freeboard is reduced from that determined by the highest seasonal mark permitted by Part 43.

(d) When the highest subdivision load line is located on a vessel used as a passenger vessel in a position between the highest and lowest seasonal load line marks, the seasonal load line marks above the subdivision load line will be omitted and those below will be marked.

(e) When the freeboard from the highest subdivision load line on a vessel used as a passenger vessel is greater than the freeboard from the lowest load line permitted by Part 43 of this subchapter, the load lines required by Part 43 of this subchapter shall be omitted and the disk with its horizontal line located in line with the highest subdivision load line.

(f) One fresh water line shall be marked. When a subdivision and a normal load line are combined, the normal fresh water line only shall be used unless the position of the subdivision load line is such that confusion will result, in which case a subdivision fresh water line may be used, marked FW, and the normal fresh water line omitted.

(g) Subdivision load lines shall be aft of the vertical line. The vertical line shall be extended as necessary to connect the lowest and highest load lines marked on the vessel.

(h) When a vessel has spaces used for cargo and passengers alternatively so that the position of the subdivision load line varies with the service, subdivision load lines for the principal passenger condition shall be marked and denoted by C_1 and the alternative conditions marked and denoted by C_2, C_3, etc. The position of each load line and the conditions under which a particular load line is applicable shall be noted in the certificate.

(i) The principal passenger condition for a vessel having spaces used for passengers and cargo alternatively is the condition where only those spaces appropriated exclusively to passengers are taken into consideration for determination of the subdivision load line.

(j) For Great Lakes vessels, references to Part 43 shall read Part 45 and a "diamond" shall be substituted for the "disk". No "fresh water" line will be marked.

SUBCHAPTER F—MARINE ENGINEERING

PART 50—GENERAL PROVISIONS

Subpart 50.01—Basis and Purpose

Sec.

50.01–1 Authority.
50.01–5 Assignment of functions.
50.01–10 Purpose of regulations.
50.01–15 Application of regulations.

Subpart 50.10—Definition of Terms Used in This Subchapter

50.10–1 Commandant.
50.10–5 Coast Guard District Commander.
50.10–10 Officer in Charge, Marine Inspection.
50.10–15 Marine inspector or inspector.
50.10–20 Requirements.
50.10–25 Headquarters.

AUTHORITY: The provisions of this Part 50 issued under R.S. 4405, as amended, 4462, as amended; 46 U.S.C. 375, 416. Interpret or apply R.S. 4399, as amended, 4400, as amended, 4417, as amended, 4417a, as amended, 4418, as amended, 4421, as amended, 4426–4431, as amended, 4433, as amended, 4434, as amended, 4453, as amended, 4488, as amended, 4491, as amended, sec. 14, 29 Stat. 690, as amended, sec. 10, 35 Stat. 428, as amended, 41 Stat. 305, as amended, secs. 1, 2, 49 Stat. 1544, 1545, as amended, sec. 17, 54 Stat. 166, as amended, sec. 3, 54 Stat. 347, as amended, sec. 3, 70 Stat. 152, sec. 3, 68 Stat. 675; 46 U.S.C. 361, 362, 391, 391a, 392, 399, 404–409, 411, 412, 435, 481, 489, 366, 395, 363, 367, 526p, 1333, 390b, 50 U.S.C. 198; E.O. 11239, July 31, 1965, 30 F.R. 9671, 3 CFR, 1965 Supp. Treasury Department Orders 120, July 31, 1950, 15 F.R. 6521; 167–14, Nov. 26, 1954, 19 F.R. 8026; 167–20, June 18, 1956, 21 F.R. 4894; CGFR 56–28, July 24, 1956, 21 F.R. 5659; 167–38, Oct. 26, 1959, 24 F.R. 8857.

Subpart 50.01—Basis and Purpose

§ 50.01–1 Authority.

(a) The authority to prescribe regulations generally is set forth in R.S. 4405 and 4462, as amended (46 U.S.C. 375 and 416), as well as in other provisions of Title 52 of the Revised Statutes and acts amendatory thereof or supplemental thereto. Under the provisions of R.S. 4403, as amended (46 U.S.C. 372), the Commandant, United States Coast Guard superintends the administration of the vessel inspection laws and is required to produce a correct and uniform administration of the inspection laws, rules, and regulations.

§ 50.01–5 Assignment of functions.

By Reorganization Plan No. 3 of 1946, effective July 16, 1946, 3 CFR, 1946 Supp.,

the marine inspection functions of the former Bureau of Marine Inspection and Navigation and its officers and employees were transferred to the Commandant, United States Coast Guard. By Reorganization Plan No. 26 of 1950, effective July 31, 1950, 3 CFR, 1950 Supp., p. 178, the functions formerly vested in the Commandant, United States Coast Guard were transferred to the Secretary of the Treasury with certain specific exceptions. The Secretary of the Treasury by an order dated July 31, 1950 (15 F. R. 6521), delegated to the Commandant the functions formerly performed by him under Reorganization Plan No. 3 of 1946.

§ 50.01–10 Purpose of regulations.

The purpose of the regulations in this subchapter is to set forth uniform minimum requirements for marine engineering in accordance with the intent of Title 52 of the Revised Statutes and acts amendatory thereof or supplemental thereto, as well as to implement various International Conventions for Safety of Life at Sea and other treaties which affect the merchant marine. The regulations are necessary to carry out the provisions of law affecting inspected vessels and such regulations have the force of law.

§ 50.01–15 Application of regulations.

(a) The regulations in this subchapter contain specifications and requirements for materials, design, construction, installation, and inspection of machinery, boilers, unfired pressure vessels, safety valves and appurtenances, including piping systems, upon the strength and efficiency of which safety of life is dependent.

(b) The regulations in this subchapter apply to installations contracted for or built on or after July 1, 1935. The regulations in Subchapter G (Marine Engineering Installations Contracted for Prior to July 1, 1935) of this chapter apply only to installations contracted for or built prior to July 1, 1935.

(c) The regulations in this subchapter are not retroactive in effect, except as provided in paragraph (d) of this section or if specifically provided for in the regulation at the time it is amended or added. The regulations amended or added subsequent to July 1, 1935, are applicable to installations contracted for or built on or after the effective date of such regulations. For the purpose of recalculating the maximum allowable pressure of boilers, unfired pressure vessels and piping under the provisions of § 61.20–15 (f), the formulas found in this subchapter may be used for boilers, unfired pressure vessels and piping: *Provided*, That such recalculation shall not permit a higher pressure than that originally allowed by the regulations in effect at the time such work was contracted for or built.

(d) Where existing vessels are reboilered, the mountings and attachments shall be renewed in accordance with the regulations in this subchapter in effect at the time such work is contracted for. The existing steam piping shall be examined as provided for in § 55.07–5, and if found to be in good condition and complying with the minimum thickness required for the pressure and temperature design conditions at the time of installation of the new boiler, the piping may be continued in service.

(e) Items of equipment previously approved by the Commandant but not complying with the latest specifications and which are in good and serviceable condition may be continued in use until replacement is necessary.

Subpart 50.10—Definition of Terms Used in This Subchapter

§ 50.10–1 Commandant.

The term "Commandant means the Commandant of the Coast Guard.

§ 50.10–5 Coast Guard District Commander.

The term "Coast Guard District Commander" means an officer of the Coast Guard designated as such by the Commandant to command all Coast Guard activities within his district, which include the inspections, enforcement, and administration of Title 52, Revised Statutes, and acts amendatory thereof or supplemental thereto, and rules and regulations thereunder.

§ 50.10–10 Officer in Charge, Marine Inspection.

The term "Officer in Charge, Marine Inspection," means any person from the civilian or military branch of the Coast Guard designated as such by the Commandant and who under the superintendence and direction of the Coast Guard District Commander is in charge of an inspection district for the performance of duties with respect to the inspections, enforcement, and administration of Title 52, Revised Statutes, and acts amendatory thereof or supplemental thereto, and rules and regulations thereunder.

§ 50.10–15 Marine inspector or inspector.

The terms "marine inspector" or "inspector" mean any person from the civilian or military branch of the Coast Guard assigned under the superintendence and direction of an Officer in Charge, Marine Inspection, or any other person as may be designated for the performance of duties with respect to the inspections, enforcement, and the administration of Title 52, Revised Statutes, and acts amendatory thereof or supplemental thereto, and rules and regulations thereunder.

§ 50.10–20 Requirements.

The term "requirements" refers to process of manufacture, characteristic, physical and chemical properties, tests, workmanship, and finish of materials.

§ 50.10–25 Headquarters.

The term "headquarters" means the office of the Commandant, United States Coast Guard, Washington, D.C., 20226.

PART 51—MATERIALS

Subpart 51.01—General

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- 51.01–5 Basic information requirements.
- 51.01–10 General classification of materials.
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- 51.25–1 Scope.

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- 51.49–1 Scope.

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- 51.58–1 Scope.
- 51.58–5 Hydrostatic tests.

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- 51.61–1 Scope.
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51.70-1 Scope.

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51.73-1 Scope.

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51.76-1 Scope.
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Subpart 51.79—Aluminum-Alloy Plates and Sheets

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51.81-1 Scope.

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51.82-1 Scope.

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Subpart 51.86—Nickel-Alloy Pipe and Tubes

51.86-1 Scope.

Subpart 51.90—Rigid Poly (Vinyl Chloride) (PVC) Materials

51.90-1 Scope.

AUTHORITY: The provisions of this Part 51 issued under R.S. 4405, as amended, 4462, as amended; 46 U.S.C. 375, 416. Interpret or apply R.S. 4399, as amended, 4400, as amended, 4417, as amended, 4417a, as amended, 4418, as amended, 4421, as amended, 4426–4431, as amended, 4433, as amended, 4434, as amended, 4453, as amended, 4488, as amended, 4491, as amended, sec. 14, 29 Stat. 690, as amended, sec. 10, 35 Stat. 428, as amended, 41 Stat. 305, as amended, secs. 1, 2, 49 Stat. 1544, 1545, as amended, sec. 17, 54 Stat. 166, as amended, sec. 3, 54 Stat. 347, as amended, sec. 3, 70 Stat. 152, sec. 3, 68 Stat. 675; 46 U.S.C. 361, 362, 391, 391a, 392, 399, 404–409, 411, 412, 435, 481, 489, 366, 395, 363, 367, 526p, 1333, 390b, 50 U.S.C. 198; E.O. 11239, July 31, 1965, 30 F.R. 9671, 3 CFR, 1965 Supp. Treasury Department Orders 120, July 31, 1950, 15 F.R. 6521; 167-14, Nov. 26, 1954, 19 F.R. 8026; 167-20, June 18, 1956, 21 F.R. 4894; CGFR 56-28, July 24, 1956, 21 F.R. 5659; 167-38, Oct. 26, 1959, 24 F.R. 8857.

Subpart 51.01—General

§ 51.01-1 Statutory requirements.

(a) Plates, bars, and shapes used as pressure parts of boilers intended for marine service shall be tested, inspected, and stamped by an inspector in accordance with the requirements of Title 52 of the Revised Statutes of the United States.

(b) Material used for pressure parts in the construction of pressure vessels other than boilers shall conform to the requirements of this part.

§ 51.01-5 Basic information requirements.

When ordering material for the construction of boilers or unfired pressure vessels to be installed on vessels subject to the inspection of the Coast Guard, boiler manufacturers shall, as far as practicable, furnish the following information to the manufacturer of the material and to the Officer in Charge, Marine Inspection, in the district where the boiler or unfired pressure vessel is to be fabricated:

(a) Name and location of manufacturer's works.

(b) Type and size of boiler or unfired pressure vessel.

(c) Manufacturer's serial or shop number.

(d) Design pressure.

(e) Name of shipyard and hull number.

(f) Vessel's name.

§ 51.01-10 General classification of materials.

(a) The materials to be used in the construction of boilers and unfired pressure vessels, piping, valves, fittings, and appurtenances below listed shall be of three general classes of which classes A and B shall be used for pressure parts and class C may be used for other parts as specified.

Class A: Tested materials manufactured under the supervision of the Coast Guard, tests of which shall be witnessed by an inspector.

Class B: Certified materials tested by the manufacturers, and certified by them as conforming to the requirements.

Class C: Materials for nonpressure parts of boilers or unfired pressure vessels such as castings for water-tube boilers, uptakes, furnace fronts, and operating equipment shall be of good commercial quality. No detail requirements are herein specified for materials in this class. Class C materials shall be accepted by inspectors without requiring tests or certification by manufacturers.

(b) Except as may be otherwise required, the classification of materials under classes A and B and the subparts of this part in which they are specified, are as follows:

CLASS A

Subparts	
51.04	Marine boiler steel plate.
51.07	Staybolt and rivet steel.
51.10	Steel bars and shapes.
51.13	Staybolt and rivet iron.

CLASS B

51.22	Flange and firebox steel plates.
51.23	Corrosion resisting steel plate, sheet, and strip for unfired pressure vessels.
51.24	Materials for low temperature service.
51.25	Carbon and alloy-steel wrought iron tubes.
51.34	Carbon and alloy-steel wrought iron pipe.
51.46	Steel forgings.
51.49	Carbon and alloy-steel bolting and nut material.
51.58	Steel castings.
51.61	Iron castings.
51.67	Copper and copper-alloy plate.
51.70	Seamless copper and copper-alloy pipe.
51.73	Seamless copper and copper-alloy tubes.
51.76	Copper-alloy castings.
51.79	Aluminum-alloy plates and sheets.
51.90	Rigid poly (vinyl chloride) (PVC) materials.

§ 51.01-15 Inspection and testing of class A material.

Inspectors shall have free entry at all times to those parts of the works where material subject to the regulations in this part is being manufactured. The manufacturer shall afford inspectors all reasonable facilities to satisfy them that the material is being manufactured in accordance with the requirements of the Commandant. Unless otherwise authorized, tests and inspection shall be made at the place of manufacture prior to shipment and shall be so conducted as not to interfere unnecessarily with the operation of the works. Inspectors shall assure themselves that test specimens are marked for positive identification with the materials which they represent. Unless otherwise specified, tests shall be made at ordinary temperature.

§ 51.01-20 Chemical analyses.

(a) A ladle analysis of each melt of class A materials shall be made by the manufacturer and a certified report thereof shall be furnished by him to the inspector upon request. This analysis shall be made from a test ingot taken during the pouring of the melt. The chemical composition thus determined shall conform to the specified requirements. This requirement shall apply also to the following class B materials:

(1) Flange and firebox quality steel plates specified in Subpart 51.22.

(2) Steel forgings specified in Subpart 51.46.

(3) Alloy-steel bolting material specified in Subpart 51.49.

(4) Steel castings specified in Subpart 51.58.

(5) Copper-alloy plate specified in Subpart 51.67.

(6) Copper-alloy castings specified in Subpart 51.76.

(b) A check analysis may be made at the discretion of the Commandant from test specimens representing material for which chemical composition is specified in any section of this part, in either class A or B. The chemical composition thus determined shall conform to the requirements.

§ 51.01-25 Certification of class B material.

(a) Certification of chemical analyses and physical tests of materials of class B shall be an affidavit by the manufacturer certifying that all materials of this class supplied by him for marine service do, or will conform to all the requirements of the regulations in this part applicable thereto.

(b) Materials in this class are not required to be tested in the presence of an inspector, but whenever deemed necessary by the Commandant, he may detail an inspector to witness such tests and satisfy himself that the requirements of the specification for class B materials are met.

§ 51.01-30 Tension tests.

(a) All tension tests shall be made on standard calibrated machines. The yield point in tension tests shall be determined by the drop of the beam or the halt in the gage of the testing machine. Except where otherwise specified in this part, the speed of the crosshead of the ma-

chine shall not exceed $\frac{1}{8}$ inch per minute per inch of gage length up to the yield point, nor shall it exceed ½ inch per minute per inch of gage length beyond the yield point. Any convenient speed of the crosshead may be used from the start of loading the test specimen until a value estimated as one-half of the yield point is reached. In determining the yield strength by use of an extensometer, the crosshead speed shall not exceed 0.025 inch per minute per inch of gage length. In the event the machine is stopped in taking readings, the speed may be exceeded in the take-up only. The ends of all test specimens shall be of form to fit the holders of the testing machine in such a way that the load will be axial.

(b) The test specimens and procedures employed for the mechanical testing of steel products covered by the specifications listed in this part shall be in conformance with A.S.T.M. A370–60T, except as otherwise provided for in this subchapter.

§ 51.01–40 Retests.

When the result of any of the physical tests specified for any of the materials does not conform to the requirements, two additional specimens may, at the request of the manufacturer, be taken from the same lot and tested in the manner specified, but in such case, both of the specimens shall conform to the requirements. In the case of tension tests, this retest shall be allowed if the percentage of elongation obtained is less than required, or if any part of the fracture is outside of the middle third of the gauge length. If any test specimen develops flaws, it shall be discarded and another specimen from the same lot substituted.

§ 51.01–45 Rejections.

Failure of the tests (or retests) specified in the regulations in this subchapter for each particular material shall be cause for rejection. Unless otherwise required, any rejection shall be reported by the inspector within 5 working days from the receipt of the test specimen. Acceptance of material on results of tests at the place of manufacture shall not prejudice the right to reject any of such material in which injurious defects are subsequently discovered. The manufacturer shall be promptly notified of such subsequent rejections, and the records shall be corrected.

§ 51.01–50 Appeals.

In case of dissatisfaction with the results of any test, the manufacturer may appeal to the Coast Guard District Commander from the decision of the Officer in Charge, Marine Inspection. Should the Coast Guard District Commander sustain the Officer in Charge, Marine Inspection, the manufacturer may appeal to the Commandant. Tested specimens which represent rejected material shall be retained for at least 30 days.

§ 51.01–55 Process of steel manufacture.

Unless otherwise officially authorized by the Commandant, all wrought steel to be used in the construction of boilers or unfired pressure vessels to be installed on vessels shall be manufactured by the open-hearth, electric furnace, or crucible process.

§ 51.01–60 Stamping plates and specimens.

(a) Class A plates shall be stamped by the manufacturer, before they are tested, with his name or trademark, the word "Marine", the letter indicating the grade of the steel, and the minimum tensile strength of the plate in pounds per square inch expressed in thousands. Inspectors shall permit cutting a plate into two or more parts before testing, but each part shall be stamped or matchmarked for identification before cutting. All plates accepted by the inspector as conforming to the requirements shall be stamped by him near the manufacturer's stamp with the official stamp of the Coast Guard, the initials of his name, and the serial number. All test specimens shall be ring-stamped or matchmarked for identification before being detached. Plates shall be stamped lengthwise in two places on one long side about 18 inches from the edges at the corners. Each butt strap shall be stamped lengthwise of the plate about the middle of the strap.

(b) The impression of the official stamp of the Coast Guard for stamping plates and specimens shall be as shown below:

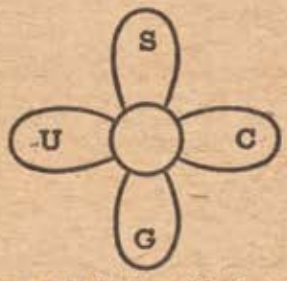


FIGURE 51.01–60 (b)—Official stamp.

§ 51.01–65 Stock plates.

Plates may be ordered to be carried in stock ashore or on shipboard for repairs to boilers and unfired pressure vessels. Such plates shall be inspected and tested at the place of manufacture and stamped for identification as stock plates. A test report for such plates shall be furnished to the Coast Guard District Commander of the district where the purchaser is located, with a copy to the purchaser. The Coast Guard District Commander shall furnish a copy thereof to the Officer in Charge, Marine Inspection, in the district where the material is kept in stock, and if the material is to be used by persons other than the original purchaser, they shall also be furnished with a copy of such report, for submittal by them to the Officer in Charge, Marine Inspection, in the district where the repairs are actually to be made before the material may be used. Vessels carrying such stock plates shall obtain and carry identification and test records of each plate. Where such plates are cut into pieces for repairs, the Officer in Charge, Marine Inspection, shall, upon request, stamp each piece so detached for identification with the original plate and a record of such stamping shall be made.

§ 51.01–70 Workmanship and finish.

All materials within the scope of the regulations in this subchapter shall be free from injurious defects and shall have a workmanlike finish.

§ 51.01–75 Heat treatment.

Some of the materials herein specified require heat treatment. This may consist of annealing, or of normalizing, or of normalizing followed by annealing, or of normalizing followed by a draw back to a temperature below the critical range. Annealing shall consist of allowing material to cool after forging or rolling to a temperature below the critical range, then reheating it to proper temperature to refine the grain and allowing it to cool in the furnace. Normalizing shall consist of allowing material to cool after forging or rolling to a temperature below the critical range, then reheating it to proper temperature to refine the grain and allowing it to cool in still air.

§ 51.01–80 Reclassification of materials.

When more than one grade is specified for any material or purpose and tests of a material of a superior grade fail to meet the requirements, such material may be reclassified and accepted as a specified lower grade if it fulfills the specified requirements for the latter. In such cases, the material shall be restamped or re-marked as required for proper identification, and revised records shall be made to cover it.

§ 51.01–85 Alternative materials.

If, in the development of industrial arts, other suitable or improved materials differing from those specified in this part are developed, their use will be given consideration, upon formal application to the Commandant with full information as to the characteristics of the material, and such scientific data and facts as may be necessary to establish the suitability and safety of the material for the use proposed. The material requirements in this subchapter are minimum requirements and are not intended to bar better materials.

§ 51.01–90 Material specification standards.

(a) The specifications prescribed in this part cover materials for use in the construction of boilers, unfired pressure vessels, piping, valves, fittings, and appurtenances, and shall comply with the standard specifications issued by the American Society for Testing Materials (A. S. T. M.), as listed in this part, subject to the limitations noted in the applicable subparts.

(b) Reference copies of all A. S. T. M. specifications listed in this part are available for reading purposes at U. S. Coast Guard Headquarters, Washington, D.C., 20226, and are on file with various Coast Guard District Commanders.

(c) The A. S. T. M. Standards referred to in this subchapter may be purchased

from the American Society for Testing Materials, 1916 Race Street, Philadelphia, Pa., 19103.

Subpart 51.04—Marine Boiler Steel Plate

§ 51.04–1 Scope.

(a) The material specifications covering marine boiler steel plate subject to class A inspection shall comply with the following standard specifications issued by the American Society for Testing Materials, subject to the limitations given in this subpart:

TABLE 51.04-1—MATERIAL SPECIFICATIONS

A.S.T.M. designation	A.S.T.M. grade	Coast Guard grade
A201-61T	A and B	A201—A and B.
A212-61T	A and B	A212—A and B.
A204-61	A, B, and C	A204—A, B, and C.
A202-56	A	A202—A.
A203-61	A, B, D, E	A203—A, B, D, and E.
A225-56	A and B	A225—A and B.
A299-56	A	A299—A.
A302-56	A and B	A302—A and B.
A353-58	A and B	A353—A and B.
A357-58		A357—A.
A387-61T	A, B, C, D, E	A387—A, B, C, D, and E.

(b) Steel plates for any part of a boiler subject to pressure and exposed to the fire or products of combustion shall be of firebox quality, steel plates for any part of a boiler subject to pressure and not exposed to the fire or products of combustion shall be of either flange or firebox quality.

(c) The grades listed in paragraph (a) of this section are suitable for arc or gas welding, but are not suitable for forge welding.

(d) Sufficient discard from the top of each ingot shall be made at any stage of the manufacture, to secure freedom from piping and undue segregation in the finished product, but in no case shall the amount of top discard be less than 30 percent.

§ 51.04–5 Heat treatment.

(a) Plates over 2 inches in thickness, before being fabricated, shall be uniformly heat-treated to produce grain refinement. Heat treatment involving quenching in a liquid medium is prohibited. If this treatment is not done at the rolling mill, the testing shall be carried out in accordance with paragraph (d) of this section.

(b) When plates are heat-treated to produce grain refinement the test specimens and the plates shall be stamped "G. R." The tensile strength of the plates in the grain-refined state shall be not less than the minimum of the specified range.

(c) Orders to the plate manufacturer or the fabricator shall specify when plates subject to the requirements of this section are to be stress-relieved and when they are to be heat-treated for grain-refinement so that proper provision may be made for the treatment of test specimens.

(d) When a fabricator, equipped to perform the work, elects to do the required heat treatment of plates for grain refinement, he shall accept the plates on the basis of the mill tests. The plate manufacturer shall make the tests prescribed in this subpart. The tension and bend test specimens shall be prepared from full thickness pieces heat-treated under conditions he considers appropriate for grain refinement and to meet the test requirements. The manufacturer shall inform the fabricator of the procedure followed in treating the pieces at the mill for guidance in treating the plates. The required physical properties shall be determined after heat treatment of the plates on specimens prepared from pieces similarly and simultaneously treated with the plates. Pieces for two tension tests, one top and one bottom, shall be provided from each plate as rolled. These pieces shall be stamped by the inspector with his official stamp for identification.

NOTE: The term "plate as rolled" as used in this section and in § 51.04–10 (c) refers to the unit plate rolled from a slab or directly from an ingot in its relation to the location and number of specimens; not to its condition.

(e) In the case of plates over 2 inches in thickness which subsequently are to be stress-relieved, the test specimens for such plates shall, before testing, be stress-relieved following the heat treatment for grain refinement.

§ 51.04–10 Test specimens.

(a) For plates 2 inches and under in thickness, tension and bent test specimens shall be the full thickness of the material and shall be machined to the form and dimensions shown in figure 51.04–10(a); or the bend test specimen may be machined with both edges parallel.

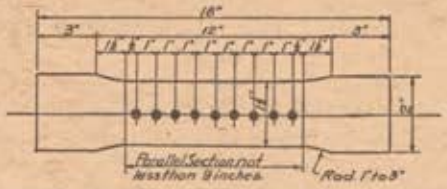


FIGURE 51.04–10 (a)—Standard rectangular tension-test specimen with 8-inch gauge length.

(b) For grade A or B plates over 2 inches and not over 4 inches in thickness, tension-test specimens may be the full thickness of the material and of the form shown in figure 51.04–10 (a); when adequate testing machine capacity is available.

(c) For plates over 2 inches in thickness, except as permitted in paragraph (b) of this section, tension-test specimens shall be machined to the form and dimensions shown in figure 51.04–10 (c); and the axis of each such specimen shall be located midway between the center and the top or bottom surface of the plate. The bend test specimens shall be at least 1½ inches in width, with both edges parallel, and may be reduced to 2 inches in thickness; but shall have one surface as rolled.

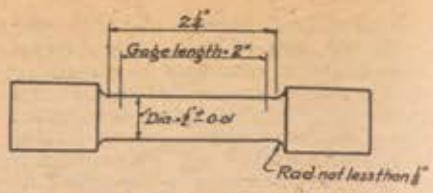


FIGURE 51.04–10 (c)—Standard round tension-test specimen with 2-inch gauge length.

§ 51.04–15 Marking.

The quality classification to be marked on all class A plates in accordance with § 51.01–60 shall be the word, "Marine" followed by the letter designating the grade of the steel.

Subpart 51.07—Staybolt and Rivet Steel

§ 51.07–1 Scope.

The material specifications covering staybolt and rivet steel subject to class A inspection shall comply with the following standard specifications issued by the American Society for Testing Materials:

TABLE 51.07-1—MATERIAL SPECIFICATIONS

A.S.T.M. designation	A.S.T.M. grade	Coast Guard grade
A31-55	A	A
A31-55	B	B
A202-56	A	C

Subpart 51.10—Steel Bars and Shapes

§ 51.10–1 Scope.

(a) The material specifications covering round steel bars and structural steel shapes subject to class A inspection shall comply with the following standard specification issued by the American Society for Testing Materials, subject to the limitations noted in this subpart:

A. S. T. M. designation:	Grade
A107–58T	1010 through 1030

§ 51.10–5 Process.

The steel shall be made by either or both of the following processes: open-hearth or electric-furnace.

§ 51.10–10 Chemical composition.

The steel shall conform to the following requirements as to chemical composition:

Phosphorus, maximum, percent:	
Acid	0.05
Basic	.04
Sulfur, maximum percent	.05

§ 51.10–15 Tensile properties.

The material shall conform to the following requirements as to tensile properties:

Tensile strength, p. s. i.	55,000 to 65,000
Yield point, p. s. i.	0.5 tensile strength
Elongation in 8 inches, minimum, percent	17.
Elongation in 2 inches, minimum, percent	20.

§ 51.10–20 Modification in elongation.

For material over ¾ inch in thickness, a deduction from the percentages of elongation specified in § 51.10–15 of 0.125 percent shall be made for each increase of 1/32 inch of the specified thickness above ¾ inch.

§ 51.10–25 Bending properties.

The bend test specimen shall stand being bent cold through 180° without cracking on the outside of the bent portion to an inside diameter which shall have the following relation to the thickness of the specimen:

TABLE 51.10-25—BENDING TEST

Thickness of material	Ratio of inside diameter of bend to thickness of specimen
¾ inch and under	½
Over ¾ to 1 inch, inclusive	1
Over 1 to 1½ inches, inclusive	1½
Over 1½ to 2 inches, inclusive	2½
Over 2 inches	3

§ 51.10–30 Test specimens.

(a) Test specimens shall be of the full thickness or diameter of material as rolled, except as specified in paragraphs (b) and (c) of this section.

(b) Test specimens for shapes and flats may be machined to the form and dimensions shown in figure 51.04–10 (a), or with both edges parallel.

(c) Test specimens for bars over 1½ inches in thickness or diameter may be machined to a thickness or diameter of at least ¾ inch for a length of at least 9 inches; or tension test specimens may conform to the dimensions shown in figure 51.04–10 (c). Bend test specimens may be 1 by ½ inch in section.

§ 51.10–35 Number of tests.

(a) One tension and one bend test shall be made from each melt; except that if material from one melt differs ⅜ inch or more in thickness, one tension and one bend test shall be made from both the thickest and the thinnest material rolled.

(b) If any test specimen shows defective machining or develops flaws, it may be discarded and another specimen substituted.

(c) If the percentage of elongation of any tension test specimen is less than that specified in § 51.10–15 and any part of the fracture is more than ¾ inch from the center of the gauge length of a 2-inch specimen, or is outside the middle third of the gauge length of an 8-inch specimen, as indicated by scribe scratches marked on the specimen before testing, a retest shall be allowed.

§ 51.10–40 Finish.

The finished material shall be free from injurious defects and shall have a workmanlike finish.

§ 51.10–45 Marking.

Bars shall, when loaded for shipment, be properly separated, and marked with the name or brand of the manufacturer and melt number for identification. The melt number shall be legibly marked on each test specimen.

Subpart 51.13—Staybolt and Rivet Iron

§ 51.13–1 Scope.

(a) The material specifications covering wrought iron bars for stays and staybolts and wrought iron rivets subject to Class A inspection shall comply with the following standard specifications issued by the American Society for Testing Materials:

TABLE 51.13-1—MATERIAL SPECIFICATIONS

A.S.T.M. designation	A.S.T.M. grade	Coast Guard grade
A84–60T	Staybolts	A
A152–60T	Rivets	B

Subpart 51.22—Flange and Firebox Steel Plates

§ 51.22–1 Scope.

(a) The material specifications covering carbon steel plate of flange and firebox quality, Class B, certified material, shall comply with the following standard specification issued by the American Society for Testing Materials:

TABLE 51.22-1—MATERIAL SPECIFICATIONS

A.S.T.M. designation	A.S.T.M. grade	Coast Guard grade
A285–67T	A (flange quality)	A
A285–67T	B (flange quality)	B
A285–67T	C (flange quality)	C
A285–67T	A (firebox quality)	A
A285–67T	B (firebox quality)	B
A285–67T	C (firebox quality)	C
A410–61T		

Subpart 51.23—Corrosion Resisting Steel Plate, Sheet and Strip for Unfired Pressure Vessels

§ 51.23–1 Scope.

(a) The material specifications for corrosion resisting steel plate, sheet, and strip, Class B, certified materials, shall comply with the following standard specifications issued by the American Society for Testing Materials:

TABLE 51.23-1—MATERIAL SPECIFICATIONS

A.S.T.M. designation	A.S.T.M. grade	Coast Guard grade
A240–63	Type 302	Type 302.
A240–63	Type 304	Type 304.
A240–63	Type 304L	Type 304L.
A240–63	Type 309S	Type 309S.
A240–63	Type 310S	Type 310S.
A240–63	Type 316	Type 316.
A240–63	Type 316L	Type 316L.
A240–63	Type 317	Type 317.
A240–63	Type 321	Type 321.
A240–63	Type 347	Type 347.
A240–63	Type 348	Type 348.
A240–63	Type 405	Type 405.
A240–63	Type 410	Type 410.
A240–63	Type 410S	Type 410S.
A240–63	Type 430A	Type 430A.
A240–63	Type 430B	Type 430B.

Subpart 51.24—Materials for Low Temperature Service

§ 51.24–1 Scope.

(a) The material specifications for materials for service at low temperatures shall comply with the following standard specifications of the American Society for Testing Materials, subject to the limitations noted in this subpart:

TABLE 51.24-1—MATERIAL SPECIFICATIONS

A.S.T.M. designation	Materials
A300–58	Steel plates for pressure vessels for service at low temperatures.
A333–63T	Seamless and welded steel pipe for low temperature service.
A334–63T	Seamless and welded steel tubes for low temperature service.
A350–61T	Forged or rolled carbon and alloy steel flanges, forged fittings, and valves and parts for low temperature service.
A352–60T	Ferritic steel castings for pressure containing parts suitable for low temperature service.

(b) Acceptance of materials listed in this subpart will be contingent upon the impact properties of the material tested at such temperatures and by such methods as may be required by the Commandant.

Subpart 51.25—Carbon and Alloy-Steel and Wrought Iron Tubes

§ 51.25–1 Scope.

(a) The material specifications covering steel and iron tubes, Class B, certified material, shall comply with the following standard specifications issued by the American Society for Testing Materials, subject to the limitations noted in this subpart:

TABLE 51.25-1(a)—MATERIAL SPECIFICATIONS

A.S.T.M. designation	A.S.T.M. grade	Coast Guard grade
Carbon-steel and iron:		
A83–63T	Low-carbon seamless steel	T83
A178–63T	A (low-carbon electric-resistance welded steel).	T178-A
A178–63T	C (medium-carbon electric-resistance welded steel).	T178-C
A179–63T	Low-carbon seamless steel condenser tubes.	T179
A192–63T	Low-carbon seamless steel	T192
A210–63T	Medium-carbon seamless steel.	T210
A226–63T	Electric resistance welded steel.	T226
Alloy steel:		
A209–63T	T1	T1
A209–63T	T1a	T1a
A209–63T	T1b	T1b
A213–63T	T2	T2
A213–63T	T5	T5
A213–63T	T5b	T5b
A213–63T	T7	T7
A213–63T	T9	T9
A213–63T	T11	T11
A213–63T	T12	T12
A213–63T	T17	T17
A213–63T	T21	T21
A213–63T	T22	T22
A213–63T	TP304	T304
A213–63T	TP304L	T304L
A213–63T	TP310	T310
A213–63T	TP316	T316
A213–63T	TP316L	T316L
A213–63T	TP321	T321
A213–63T	TP321H	T321H
A213–63T	TP347	T347
A213–63T	TP348	T348
A250–63T	T1	T1
A250–63T	T1a	T1a
A250–63T	T1b	T1b
A423–63T		

(b) Grade T179 shall be permitted only for use as tube material in heat exchangers and tubing for hydraulic systems.

Subpart 51.34—Carbon and Alloy-Steel and Wrought Iron Pipe

§ 51.34–1 Scope.

(a) The material specifications covering steel and wrought iron pipe, Class B, certified material, shall comply with the following standard specifications issued by the American Society for Testing Materials:

TABLE 51.34-1—MATERIAL SPECIFICATIONS

A.S.T.M. designation	A.S.T.M. grade	Coast Guard grade
Carbon-steel and iron:		
A53-63T	Butt-welded steel	P53-BW
A53-63T	A (seamless steel)	P53-A
A53-63T	B (seamless steel)	P53-B
A53-63T	A (electric-resistance welded steel).	P53-RW-A
A53-63T	B (electric-resistance welded steel).	P53-RW-B
A106-63T	A (seamless steel)	P106-A
A106-63T	B (seamless steel)	P106-B
A106-63T	C (seamless steel)	P106-C
A135-63T	A (electric-resistance welded steel).	P135-A
A135-63T	B (electric-resistance welded steel).	P135-B
A72-62T	Lap-welded wrought iron.	P72-LW
A72-62T	Butt-welded wrought iron.	P72-BW
Alloy steel:		
A312-63T	TP304	P304
A312-63T	TP304L	P304L
A312-63T	TP309	P309
A312-63T	TP310	P310
A312-63T	TP316	P316
A312-63T	TP316L	P316L
A312-63T	TP317	P317
A312-63T	TP321	P321
A312-63T	TP347	P347
A312-63T	TP348	P348
A335-63T	P1	P1
A335-63T	P2	P2
A335-63T	P5	P5
A335-63T	P5C	P5C
A335-63T	P7	P7
A335-63T	P9	P9
A335-63T	P11	P11
A335-63T	P12	P12
A335-63T	P15	P15
A335-63T	P21	P21
A335-63T	P22	P22

Subpart 51.46—Steel Forgings

§ 51.46–1 Scope.

The material specifications covering carbon-steel and alloy-steel pipe flanges, forged fittings, valves and parts of class B, certified material, intended for general service and high-temperature service, shall comply with the following standard specifications issued by the American Society for Testing Materials, subject to the limitations noted in this subpart:

TABLE 51.46-1—MATERIAL SPECIFICATIONS

A.S.T.M. designation	A.S.T.M. grade	Coast Guard grade
Carbon-steel:		
A105-61T	I	F105-I
A105-61T	II	F105-II
A181-61T	I	F181-I
A181-61T	II	F181-II
Alloy-steel:		
A182-61T	F1	F1
A182-61T	F5	F5
A182-61T	F5a	F5a
A182-61T	F6	F6
A182-61T	F7	F7
A182-61T	F9	F9

TABLE 51.46-1—MATERIAL SPECIFICATIONS—Continued

A.S.T.M. designation	A.S.T.M. grade	Coast Guard grade
Alloy-steel—Con.		
A182-61T	F11	F11
A182-61T	F12	F12
A182-61T	F21	F21
A182-61T	F22	F22
A182-61T	F304	F304
A182-61T	F304L	F304L
A182-61T	F310	F310
A182-61T	F316	F316
A182-61T	F316L	F316L
A182-61T	F321	F321
A182-61T	F347	F347
A182-61T	F348	F348
A234-59T	WPA	WPA
A234-59T	WPB	WPB
A234-59T	WPC	WPC
A234-59T	WPI	WPI
A234-59T	WP12	WP12
A234-59T	WP11	WP11
A234-59T	WP22	WP22
A234-59T	WP5	WP5
A336-62T	F1	F1
A336-62T	F2	F2
A336-62T	F5	F5
A336-62T	F5a	F5A
A336-62T	F6	F6
A336-62T	F22	F22
A336-62T	F8	F8
A336-62T	F8M	F8M
A336-62T	F8C	F8C
A336-62T	F8T	F8T
A336-62T	F25	F25
A403-61T	WP304	WP304
A403-61T	WP304L	WP304L
A403-61T	WP309	WP309
A403-61T	WP310	WP310
A403-61T	WP347	WP347
A403-61T	WP316	WP316
A403-61T	WP316L	WP316L
A403-61T	WP317	WP317
A403-61T	WP321	WP321
A403-61T	WP348	WP348

§ 51.46–5 Hydrostatic tests.

Valves and pipe fittings shall be tested after machining to a hydrostatic pressure as required by § 61.30–5 of this subchapter.

Subpart 51.49—Carbon and Alloy-Steel Bolting and Nut Material

§ 51.49–1 Scope.

The material specifications covering carbon and alloy-steel bolts and nuts of class B, certified material, shall comply with the following standard specifications of the American Society for Testing Materials:

TABLE 51.49-1—MATERIAL SPECIFICATIONS

A.S.T.M. designation	A.S.T.M. grade	Coast Guard grade
Carbon-steel bolting:		
A307-63T	B	B
Alloy-steel bolting:		
A193-62T	B5 (5 Cr–0.50 Mo)	B5
A193-62T	B6 (12 Cr)	B6
A193-62T	B7 (1 Cr–0.20 Mo)	B7
A193-62T	B14 (1 Cr–0.35 Mo–0.25 Va)	B14
A193-62T	B16 (1 Cr–0.55 Mo–0.30 Va)	B16
A193-62T	B8C (18 Cr–8 Ni+Co)	B8C
A193-62T	B8T (18 Cr–8 Ni+Ti)	B8T
Carbon and alloy steel nuts:		
A194-62T	1 (carbon-steel)	1
A194-62T	2 (carbon-steel)	2
A194-62T	2H (carbon-steel)	2H
A194-62T	3 (5 Cr–0.50 Mo–0.10 Si)	3
A194-62T	4 (0.15 Si–0.20 Mo)	4

Subpart 51.58—Steel Castings

§ 51.58–1 Scope.

(a) The material specifications covering carbon and alloy-steel castings of class B, certified material, shall comply with the following standard specifications issued by the American Society for Testing Materials, subject to the limitations noted in this subpart:

TABLE 51.58-1—MATERIAL SPECIFICATIONS

A.S.T.M. designation	A.S.T.M. grade	Coast Guard grade
Carbon-steel:		
A216-63T	WCA	WCA
A216-63T	WCB	WCB
Alloy-steel:		
A217-60T	WC1 (C–Mo)	WC1
A217-60T	WC4 (1 Ni–0.65 Cr–0.50 Mo).	WC4
A217-60T	WC5 (0.80 Ni–0.70 Cr–1 Mo.)	WC5
A217-60T	WC6 (1.25 Cr–0.50 Mo)	WC6
A217-60T	WC9 (2.25 Cr–1 Mo)	WC9
A217-60T	C5 (5 Cr–0.50 Mo)	C5
A217-60T	C12 (9 Cr–1 Mo)	C12
A351-63T	CA15	CA15
A351-63T	CF8	CF8
A351-63T	CF8M	CF8M
A351-63T	CF8C	CF8C
A351-63T	CH20	CH20
A351-63T	CK20	CK20

(b) Grades C5, C12, WCA, WCB, WC1, WC4, WC5, WC6, and WC9 are suitable for arc or gas welding. Other grades may be considered weldable when employing proper welding technique approved by the Commandant.

§ 51.58–5 Hydrostatic tests.

(a) Valves and pipe fittings shall be tested after machining to a hydrostatic pressure as required by § 61.30–5 of this subchapter.

(b) Pressure containing castings other than those specified in paragraph (a) in this section shall be tested to a hydrostatic pressure of 2 times the maximum allowable pressure and show no leaks.

Subpart 51.61—Iron Castings

§ 51.61–1 Scope.

The material specifications covering nodular cast iron, malleable iron and gray iron castings of Class B, certified material, used for pipe fittings, valves, flanges and manifolds, shall comply with the following standard specifications issued by the American Society for Testing Materials, subject to the limitations noted in this subpart:

TABLE 51.61-1—MATERIAL SPECIFICATIONS

A.S.T.M. designation	A.S.T.M. grade	Coast Guard grade
Nodular iron:		
A395-61	60-45-15	60-45-15.
Malleable iron:		
A47-61	32510	A1.
A47-61	35018	A2.
A197-47	Cupola	B.
Cast iron:		
A126-61T	Class A (regular)	C.
A126-61T	Class B (higher strength).	D.
A126-61T	Class C (high test)	E.
A278-62T	Class No. 20	No. 20.
A278-62T	Class No. 25	No. 25.
A278-62T	Class No. 30	No. 30.
A278-62T	Class No. 35	No. 35.
A278-62T	Class No. 40	No. 40.
A278-62T	Class No. 50	No. 50.
A278-62T	Class No. 60	No. 60.

§ 51.61–5 Hydrostatic tests.

Castings intended for use as valves and pipe fittings shall be tested after machining to a hydrostatic pressure as required by § 61.30–5 of this subchapter.

§ 51.61–10 Markings.

Each nodular iron casting shall be legibly marked for material identification, either by casting or stamping, with the A. S. T. M. designation or grade.

Subpart 51.67—Copper and Copper-Alloy Plate

§ 51.67–1 Scope.

(a) The material specifications covering copper and copper-alloy rolled plate of class B, certified material, suitable for use as shells and tube sheets of heat exchangers and unfired pressure vessels, shall comply with the following standard specifications issued by the American Society for Testing Materials, subject to the limitations noted in this subpart:

TABLE 51.67-1—MATERIAL SPECIFICATIONS

A.S.T.M. designation	A.S.T.M. grade	Coast Guard grade
Copper:		
B11-61	Type ETP (tough pitch copper nonarsenical).	B11-1.
B11-61	Type DHP (phosphorized copper nonarsenical).	B11-2.
B11-61	Type ATP (tough pitch arsenical copper).	B11-3.
B11-61	Type DPA (phosphorized arsenical copper).	B11-4.
Copper-alloy:		
B96-61	Copper silicon alloy A or C	B96-A or C.
B169-55	Aluminum bronze alloy D	B169-D.
B171-58	Naval brass	B171-A.
B171-58	Admiralty metal	B171-B.
B171-58	Copper-nickel alloy 70-30	B171-C.
B171-58	Copper-nickel alloy 90-10	B171-D.
B171-58	Aluminum bronze alloy D	B171-E.
B171-58	Aluminum bronze alloy E	B171-F.
B-402	Copper-nickel alloy 70-30	B-402-A.
B-402	Copper-nickel alloy 90-10	B-402-B.

(b) When copper plates are to be welded, grades B11–2 and B11–4 only shall be employed.

Subpart 51.70—Seamless Copper and Copper-Alloy Pipe

§ 51.70–1 Scope.

The material specifications covering seamless copper and copper-alloy pipe, of class B, certified material, shall comply with the following standard specifications issued by the American Society for Testing Materials:

TABLE 51.70-1—MATERIAL SPECIFICATIONS

A.S.T.M. designation	A.S.T.M. grade	Coast Guard grade
B42-58	Seamless copper	B42
B43-58	Red brass	B43

Subpart 51.73—Seamless Copper and Copper-Alloy Tubes

§ 51.73–1 Scope.

(a) The material specifications covering seamless copper and copper-alloy tubes, of class B, certified material, shall comply with the following standard specifications issued by the American Society for Testing Materials, subject to the limitations noted in this subpart:

TABLE 51.73-1—MATERIAL SPECIFICATIONS

A.S.T.M. designation	A.S.T.M. grade	Coast Guard grade
B88-61	Copper Type K	B88-K.
B88-61	Copper Type L	B88-L.
B88-61	Copper Type M	B88-M.
B75-61	Oxygen-free copper	B75-D.
B75-61	Phosphorized copper Type DPL.	B75-A.
B75-61	Phosphorized copper Type DHP.	B75-B.
B75-61	Phosphorized arsenical copper Type DPA.	B75-C.
B111-60	Copper	B111-A.
B111-60	Arsenical copper	B111-B.
B111-60	Red brass	B111-C.
B111-60	Admiralty metal grades A, B, C, and D.	B111-D.
B111-60	Aluminum brass grade B.	B111-E.
B111-60	Aluminum bronze	B111-F.
B111-60	Copper-nickel 70-30	B111-G.
B111-60	Copper-nickel 80-20	B111-H.
B111-60	Copper-nickel 90-10	B111-I.

(b) When copper tubes are to be welded, deoxidized copper shall be employed.

Subpart 51.76—Copper-Alloy Castings

§ 51.76–1 Scope.

The material specifications covering bronze castings of class B, certified material, for pressure-containing parts of valves, pipe fittings, and similar appliances, shall comply with the following standard specifications issued by the American Society for Testing Materials, subject to the limitations noted in this subpart:

TABLE 51.76-1—MATERIAL SPECIFICATIONS

A.S.T.M. designation	A.S.T.M. grade	Coast Guard grade
B61-60	Steam or valve bronze.	2A.
B62-60	Composition bronze or ounce metal.	4A.
B143-61	Tin bronze, 1A	1A.
B143-61	Tin bronze, 1B	1B.

§ 51.76–5 Hydrostatic tests.

Castings intended for use as pipe flanges and flanged fittings shall be tested after machining to a hydrostatic test as required by § 61.30–5 of this subchapter.

Subpart 51.79—Aluminum-Alloy Plates and Sheets

§ 51.79–1 Scope.

(a) The material specifications covering aluminum-alloy plate and sheet of Class B, certified material, suitable for use as shells and tube sheets of unfired pressure vessels and heat exchangers, shall comply with the following standard specifications issued by the American Society for Testing Materials:

TABLE 51.79-1—MATERIAL SPECIFICATIONS

A.S.T.M. designation	A.S.T.M. grade		Coast Guard grade
	Alloy	Temper	
B209-61	1060	0	1060-0.
B209-61	1100	0	1100-0.
B209-61	3003	0	3003-0.
B209-61	3004	0	3004-0.
B209-61	5050	0	5050-0.
B209-61	5052	0	5052-0.
B209-61	5083	0	5083-0.
B209-61	5086	0	5086-0.
B209-61	5154	0	5154-0.
B209-61	5456	0	5456-0.
B209-61	6061	T6	6061-T6.

Subpart 51.80—Aluminum-Alloy Pipe and Tubes

§ 51.80–1 Scope.

(a) The material specifications covering aluminum-alloy pipe and tubes of Class B, certified materials shall comply with the following standard specifications issued by the American Society for Testing Materials:

TABLE 51.80-1—MATERIAL SPECIFICATIONS

A.S.T.M. designation	A.S.T.M. grade		Coast Guard grade
	Alloy	Temper	
B210-61	1060	0	1060-0.
B210-61	3003	0	3003-0.
B210-61	5154	0	5154-0.
B210-61	6061	T6	6061-T6.
B210-61	6063	T6	6063-T6.
B234-61	6061	T6	6061-T6.
B235-61	1060	0	1060-0.
B235-61	3003	0	3003-0.
B235-61	5154	0	5154-0.
B235-61	5456	0	5456-0.
B235-61	6061	T6	6061-T6.
B235-61	6063	T6	6063-T6.
B241-61	5456	0	5456-0.
B241-61	6061	T6	6061-T6.
B241-61	6063	T6	6063-T6.

Subpart 51.81—Aluminum-Alloy Forgings

§ 51.81–1 Scope.

(a) The material specifications covering aluminum-alloy forgings of Class B, certified materials, shall comply with the following standard specifications issued by the American Society for Testing Materials:

TABLE 51.81-1—MATERIAL SPECIFICATIONS

A.S.T.M. designation	A.S.T.M. grade		Coast Guard grade
	Alloy	Temper	
B247-61	3003	F	3003-F.
B247-61	6061	T6	6061-T6.
B247-61	6063	T6	6063-T6.

Subpart 51.82—Aluminum-Alloy Bars, Rods, and Shapes

§ 51.82–1 Scope.

(a) The material specifications covering aluminum-alloy bars, rods, and shapes of Class B, certified materials, shall comply with the following standard specifications issued by the American Society for Testing Materials:

TABLE 51.82-1—MATERIAL SPECIFICATIONS

A.S.T.M. designation	A.S.T.M. grade		Coast Guard grade
	Alloy	Temper	
B211-61	6061	0	6061-T6.
B221-61	5083	0	5083-0.
B221-61	5154	0	5154-0.
B221-61	5456	0	5456-0.
B221-61	6061	T6	6061-T6.

Subpart 51.85—Nickel-Alloy Plates and Sheets

§ 51.85-1 Scope.

(a) The material specifications covering nickel-alloy plates and sheets of Class B, certified materials, shall comply with the following standard specification issued by the American Society for Testing Materials:

TABLE 51.85-1—MATERIAL SPECIFICATIONS

A.S.T.M. designation	A.S.T.M. grade	Coast Guard grade
B127-61	Hot or cold rolled	B127.

Subpart 51.86—Nickel-Alloy Pipe and Tubes

§ 51.86-1 Scope.

(a) The material specifications covering nickel-alloy pipe and tubes of Class B, certified material, shall comply with the following standard specification issued by the American Society for Testing Materials:

TABLE 51.86-1—MATERIAL SPECIFICATIONS

A.S.T.M. designation	A.S.T.M. grade	Coast Guard grade
B163-61	Nickel copper alloy	B163.
B165-61		B165.

Subpart 51.90—Rigid Poly (Vinyl Chloride) (PVC) Materials

§ 51.90-1 Scope.

(a) The material specifications covering materials fabricated of rigid polyvinylchloride (PVC), Class B, certified materials, shall comply with the following standard specifications issued by the American Society for Testing Materials, subject to the limitations noted in this subpart:

TABLE 51.90-1—MATERIAL SPECIFICATIONS

A.S.T.M. designation	A.S.T.M. grade	Coast Guard grade
D1784-60T	Type I, Grade 1	
D1784-60T	Type I, Grade 2	
D1784-60T	Type II, Grade 1	
D1785-60T	Type I, Grade 1	
D1785-60T	Type I, Grade 2	
D1785-60T	Type II, Grade 1	

(b) PVC pipe that is to be used for potable water shall bear the seal of approval or NSF mark of the National Sanitation Foundation Testing Laboratory Incorporated, School of Public Health, University of Michigan, Ann Arbor, Mich., 48103.

PART 52—CONSTRUCTION

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AUTHORITY: The provisions of this Part 52 issued under R.S. 4405, as amended, 4462, as amended; 46 U.S.C. 375, 416. Interpret or apply R.S. 4399, as amended, 4400, as amended, 4417, as amended, 4417a, as amended, 4418, as amended, 4421, as amended, 4426-4431, as amended, 4433, as amended, 4434, as amended, 4453, as amended, 4488, as amended, 4491, as amended, sec. 14, 29 Stat. 690, as amended, sec. 10, 35 Stat. 428, as amended, 41 Stat. 305, as amended, secs. 1, 2, 49 Stat. 1544, 1545, as amended, sec. 17, 54 Stat. 166, as amended, sec. 3, 54 Stat. 347, as amended, sec. 3, 70 Stat. 152, sec. 3, 68 Stat.

675; 46 U.S.C. 361, 362, 391, 391a, 392, 399, 404–409, 411, 412, 435, 481, 489, 366, 395, 363, 367, 526p, 1333, 390b; 50 U.S.C. 198; E.O. 11239, July 31, 1965, 30 F.R. 9671, 3 CFR, 1965 Supp. Treasury Department Orders 120, July 31, 1950, 15 F.R. 6521; 167–14, Nov. 26, 1954, 19 F.R. 8026; 167–20, June 18, 1956, 21 F.R. 4894; CGFR 56–28, July 24, 1956, 21 F.R. 5659; 167–38, Oct. 26, 1959, 24 F.R. 8857.

Subpart 52.01—Procedure and General Requirements

§ 52.01–1 Definitions.

(a) *Main boiler.* A main boiler is a steam boiler used for generating steam for propulsion purposes on shipboard.

(b) *Auxiliary or donkey boiler.* An auxiliary or donkey boiler is a steam boiler used for all purposes on shipboard for which steam may be required other than propulsion.

(c) *Pressure vessel.* A pressure vessel is a vessel containing gases, vapors, or liquids under pressure. (See § 54.01–5 of this subchapter.)

(d) *Water-tube boiler.* A water-tube boiler is a steam boiler in which the boiler tubes contain water and steam, the heat being applied to the outside surface of the tubes; and is composed generally of drums, headers, and tubes.

(e) *Internally-fired fire-tube boiler (Scotch boiler).* An internally-fired fire-tube boiler is a steam boiler containing furnaces, one or more combustion chambers and tubes or flues, which are surrounded by water and through which the products of combustion pass from the furnace to the uptake. In such boilers no part of the shell is in contact with the fire or products of combustion.

(f) *Externally fired fire-tube or flue boiler (horizontal return tubular).* An externally fired fire-tube or flue boiler is a steam boiler, part of the outer shell of which is exposed to fire or to the products of combustion, and containing flues through which such products pass from the furnace to the uptake.

(g) *Factor of safety.* Factor of safety is the ratio of the ultimate strength of the material to the maximum allowable stress.

(h) *Pressure or p. s. i.* Pressure or p. s. i. is the gauge pressure or the pressure above the atmospheric pressure in pounds per square inch.

(i) *Design pressure.* Design pressure is the theoretical bursting pressure of the weakest part of a boiler, pressure vessel, or piping divided by its factor of safety.

(j) *Maximum allowable pressure.* The maximum allowable pressure of a boiler and its appurtenances or of an unfired pressure vessel shall be considered as the highest setting of the safety valves or relief valves.

(k) *Repair.* Repair is the restoration of any damaged or impaired part to an effective and safe condition.

(l) *Alteration.* Alteration is a structural modification of or departure from an approved design or existing construction.

(m) *Packaged boiler.* A packaged boiler is a steam boiler equipped, and shipped complete with fuel burning equipment, mechanical draft equipment, feed water apparatus and all necessary controls for manual or automatic operation, all completely mounted on a common base and requiring only to be connected to fuel, water and electric supplies to be ready for use.

(n) *Fired steam boiler.* A pressure vessel in which steam is generated by the application of heat resulting from the combustion of fuel is classed as a fired steam boiler.

(o) *Unfired steam boilers.* An unfired pressure vessel in which steam is generated is classed as an unfired steam boiler. (See § 54.03–27 of this subchapter for requirements for unfired steam boilers.)

§ 52.01–5 Plans.

(a) Manufacturers intending to fabricate boilers, unfired pressure vessels or appliances of riveted, welded, brazed, or seamless material to be installed on vessels subject to inspection by the Coast Guard, shall submit detail plans in triplicate which shall be fully descriptive of the pressure containing parts of such boilers, unfired pressure vessels, or appliances to be manufactured, to the Officer in Charge, Marine Inspection, having jurisdiction over the vessel. When due to location of the shipyard or design office, such a procedure would result in unnecessary delay in transmission, the plans may be forwarded directly to the Commandant (MMT), U.S. Coast Guard, Washington, D.C., 20226.

(b) The procedure specified in paragraph (a) of this section shall apply also to proposed alterations in boilers, unfired pressure vessels, or appliances of riveted, welded, brazed, or seamless material.

(c) In addition to the requirements specified in paragraph (a) of this section, manufacturers intending to fabricate packaged boilers to be installed on vessels subject to inspection by the Coast Guard shall submit detail plans, in triplicate, fully descriptive of the manual or automatic features of such boilers, to the Commandant (MMT), U. S. Coast Guard, Washington, D.C., 20226. Manufacturers intending to fabricate automatically controlled packaged auxiliary boilers shall submit plans and descriptive data, in quadruplicate, as specified in Subpart 162.026 of Subchapter Q (Specifications) of this chapter.

§ 52.01–10 Automatically controlled packaged boilers.

All automatically controlled packaged auxiliary boilers shall be designed, constructed and tested in conformance with the requirements of Subpart 162.026 of Subchapter Q (Specifications) of this chapter.

§ 52.01–15 Conditions for approval.

(a) Manufacturers of boilers and unfired pressure vessels to be installed on vessels subject to inspection by the Coast Guard shall make calculations of the pressure parts of such boilers and unfired pressure vessels using the formulas provided in this subchapter, and submit such calculations for approval together with the drawings required by § 52.01–5. In making calculations, the design stress shall not exceed the maximum allowable stresses for the material.

(b) When it is determined that the design of the boiler or unfired pressure vessel complies with the requirements of this subchapter and, in the case of boilers, with the requirements of Part 162 of Subchapter Q (Specifications) of this chapter, the drawings shall be approved for the maximum allowable pressure at which the boiler or unfired pressure vessels may be operated. If it is determined that the design does not comply with the specified requirements, the manufacturer will be notified by a written statement which will list the reasons for disapproval.

§ 52.01–20 Appeals.

In case the design is disapproved by the Officer in Charge, Marine Inspection, the manufacturer may appeal within 30 days, to the Coast Guard District Commander of the district, and should the Coast Guard District Commander sustain the Officer in Charge, Marine Inspection, the manufacturer may, within 30 days, further appeal to the Commandant. The decision of the Commandant shall be final.

§ 52.01–25 Certifications and affidavits of manufacturers.

(a) In requesting inspection of a new boiler or pressure vessel subject to inspection by the Coast Guard, the manufacturer shall file with the Officer in Charge, Marine Inspection, a certification of a data report in triplicate on Form CG–2935 for boilers or Form CG–2936 for unfired pressure vessels. (See § 61.45–5 or § 61.45–10 of this subchapter.)

(b) Manufacturers of class B materials, such as pipe, valves, flanges, fittings, traps, separators, castings, forgings, etc., or appliances, proposed for use on vessels subject to inspection by the Coast Guard, shall file at Headquarters affidavits duly executed on Form CG–935A certifying that such materials or appliances will be manufactured in accordance with the regulations in this subchapter. (See § 61.45–15 of this subchapter.)

§ 52.01–30 Certification required for duplicate boilers or pressure vessels.

A manufacturer desiring to construct any boiler or pressure vessel which is identical with a boiler or pressure vessel previously approved by the Officer in Charge, Marine Inspection, shall not be required to resubmit drawings, but shall submit to the Officer in Charge, Marine Inspection, a certificate that the proposed boiler or pressure vessel conforms in every respect with drawings previously approved. Such certificate shall contain the boiler or pressure vessel number, the drawing number or numbers, and the date of approval. If, upon examination, the Officer in Charge, Marine Inspection, ascertains that the said approved drawings meet the requirements specified in § 52.01–15, the

manufacture of such boiler or pressure vessel shall be authorized. In case of disapproval of the request by the Officer in Charge, Marine Inspection, the manufacturer shall have the right of appeal, as specified in § 52.01–20.

§ 52.01–35 Auxiliary, donkey, and low-pressure heating boilers.

(a) All auxiliary and donkey boilers shall be designed, constructed, installed, and inspected in accordance with the requirements specified in this subchapter for main boilers, and shall be subject to the same initial procedure and general requirements.

(b) Low-pressure steam and hot-water heating boilers, the maximum allowable pressure of which does not exceed 30 pounds per square inch, shall conform to the requirements of Part 53 of this subchapter. Boilers of this type, the maximum allowable pressure of which exceeds 30 pounds per square inch, shall conform to the requirements specified in this subchapter for main boilers.

§ 52.01–40 Materials and workmanship.

All materials to be used in any of the work specified in the various sections of this part shall be free from injurious defects and shall have a workmanlike finish. The construction work shall be executed in a workmanlike manner with proper tools or equipment and shall be free from defects which would impair strength or durability.

§ 52.01–50 Boilers or pressure vessels of foreign vessels.

(a) Boilers or pressure vessels of foreign vessels admitted to American registry shall be inspected in the same manner as boilers on American vessels. The hydrostatic test of such boilers or pressure vessels shall be one and one-half times the maximum allowable pressure under which they have been operated at the first United States inspection.

(b) This allowable pressure shall be accepted as the basis for determining the maximum allowable pressure where it is not practicable or possible to secure a record of the tests of the plates that entered into the construction of the boiler or pressure vessel. The Officer in Charge, Marine Inspection, may reduce the maximum allowable pressure if deemed necessary after a close examination of the general conditions or design of the boiler or pressure vessel.

§ 52.01–55 Request for increase in pressure.

(a) When the maximum allowable pressure of a boiler has been established, an increase in pressure shall not be granted unless the boiler design meets the requirements of this subchapter in effect at the time the boiler was contracted for or built; but in no case will a pressure increase be authorized for boilers constructed prior to the effective date of the regulations dated November 19, 1952, if the minimum thickness found by actual measurements shows that the boiler will have a factor of safety of less than 4½. The piping system, machinery, and appurtenances shall meet the present requirements of this subchapter for the maximum allowable pressure requested. An increase in pressure shall be granted only by the Commandant upon presentation of data or drawings proving that the requested increase in pressure is justified.

(b) When existing boilers are replaced by new boilers designed to operate at pressures in excess of the pressure allowed by the certificate of inspection, an increase in pressure shall not be authorized unless the boiler design, piping systems and machinery meet the requirements of this subchapter for the maximum pressure requested. An increase in maximum allowable pressure shall be granted only by the Commandant upon presentation of data or drawings proving that the boiler, piping system and machinery will operate safely at the desired maximum pressure of the system.

§ 52.01–60 Alternative materials or methods of construction.

If, in the development of industrial arts, improved materials or methods of construction are developed, their use in lieu of those specified will be given consideration upon formal application to the Commandant, with full information as to their characteristics, together with such scientific data and evidence as may be necessary to establish the suitability of such materials or methods of construction for the purpose intended.

§ 52.01–70 Experimental determination of pressure rating.

(a) Where approval is requested for a boiler structure, pressure vessel or any part thereof which, due to its irregular form, process of manufacture, or for any other reason, becomes a new or difficult subject of accurate mathematical analysis, the Commandant may require a full size specimen to be furnished for the purpose of making any tests which he may consider necessary to determine a safe and fair pressure rating for such pressure vessel or pressure part.

(b) In lieu of the proof hydrostatic tests as prescribed in Subpart 61.35 of this subchapter, the Commandant may permit the use of empirical formulas for determining the maximum allowable pressure of pressure vessels of irregular form, or where the stresses cannot be accurately determined. The empirical formulas shall be based upon proof hydrostatic test data acceptable to the Commandant.

§ 52.01–75 Inspectors' decisions.

When it becomes necessary for inspectors to make decisions on certain matters covered by the regulations in this subchapter, they shall in making their reports quote the section and paragraph number on which their decisions are based. Whenever it is necessary to make decisions in matters not specifically covered by the regulations in this subchapter, they shall in making their reports state clearly the reasons which caused them to arrive at such decisions.

§ 52.01–85 Alternative procedures to govern new designs or methods of construction.

When new procedures, designs, or methods of construction are submitted for approval, the Commandant is authorized to act regarding the approval or disapproval of such new developments for which no regulations have been provided.

Subpart 52.05—Cylindrical Shells

§ 52.05–1 Definitions.

(a) *Cylindrical shell.* The term "cylindrical shell," as used in the regulations in this subchapter means the cylinder forming the outer envelope of a boiler or other pressure vessel, or of a drum which is a part of a boiler consisting of one or more plates properly riveted, welded, or otherwise joined or of seamless construction as hereinafter specified. (This does not include curved tube sheets set forth in Subpart 52.40.)

(b) *Course.* A course is a section of a cylindrical shell which comes between circumferential joints.

§ 52.05–5 Materials.

(a) Plates shall be of marine boiler steel complying with subpart 51.04 of this subchapter, except that boilers designed for pressures not exceeding 150 pounds per square inch may be constructed of steel meeting the specifications of subpart 51.22 of this subchapter, and which are tested, inspected, and stamped in conformance with the requirements for class A materials.

(b) Boiler shells not exceeding 24 inches in diameter may be of seamless pipe or tubing in accordance with requirements of § 52.05–15. Boiler shells not exceeding 18 inches in diameter may be fabricated of electric-resistance butt-welded pipe in accordance with § 52.05–20.

§ 52.05–10 Computations.

(a)(1) *General.* The maximum allowable pressure and the minimum thickness of cylindrical shells subject to internal pressure shall be determined by the strength of the weakest course computed from the thickness and tensility of the material, the efficiency of the longitudinal joint, or of the ligament efficiency between the tube holes in the shell or drum (whichever is the least), the inside or outside radius of the course, and the maximum allowable stress.

(2) *Boiler shells.* (i) Cylindrical headers and drums up to and including 24 inches in outside diameter shall be computed in accordance with Formula (3).

(ii) Cylindrical shells larger than 24 inches in outside diameter, where the thickness of the shell does not exceed one-half of the inside radius, and the designed temperature does not exceed 900° F., Formula (1) shall be used. Where the thickness exceeds one-half of the inside radius, and for temperatures up to that of saturated steam at critical pressure (705.4° F.), Formula (2) shall be used.

(iii) The minimum thickness of boiler plates shall not be less than ¼ inch where the diameter of the shell is 36

inches and under and shall not be less than 5/16 inch when the diameter is over 36 inches and not greater than 54 inches, and not less than 3/8 inch for shell diameter exceeding 54 inches but not greater than 72 inches.

$$P=\frac{STE}{R+0.6T} \text{ or } T=\frac{PR}{SE-0.6P} \quad (1)$$

$$P=SE\left(\frac{R_o^2-R^2}{R_o^2+R^2}\right) \quad (2)$$

$$P=\frac{SE}{\frac{D}{2T}-y} \text{ or } T=\frac{PD}{2SE+2yP} \quad (3)$$

Where:

P = maximum allowable pressure, in pounds per square inch. The value of P in formula (3) shall not be taken as less than 100 p.s.i. for any condition of service or material.

S = maximum allowable stress, in pounds per square inch, taken from Tables 52.05-10(a) and 54.03-10(c) and subject to the limitations of § 52.05-12.

T = minimum thickness of the shell plates, in inches.

R = inside radius of the shell, in inches.

R_o = outside radius of the shell, in inches.

D = outside diameter of header or drum, in inches.

E = minimum efficiency of the longitudinal joints or of ligaments between tube holes or other openings.

y = a coefficient having values as follows:

Materials	Temperature, ° F.					
	900 and below	950	1,000	1,050	1,100	1,150 and above
Ferritic steels	0.4	0.5	0.7	0.7	0.7	0.7
Austenitic steels	0.4	0.4	0.4	0.4	0.5	0.7

TABLE 52.05-10(a)—MAXIMUM ALLOWABLE STRESSES [1] FOR FERROUS MATERIALS

Specification subpart	A.S.T.M. designation	Grade		Minimum tensile strength p.s.i.	Notes	For metal temperatures not exceeding °F.[2]											
		A.S.T.M.	C.G.			650	700	750	800	850	900	950	1,000	1,050	1,100	1,150	1,200
PLATE																	
Carbon steel:																	
51.04	A201	A	A	55,000		13,750	13,250	12,650	10,200								
51.04	A201	B	B	60,000		15,000	14,350	12,950	10,800								
51.04	A212	A	C	65,000		16,250	15,500	13,850	11,400								
51.04	A212	B	D	70,000		17,500	16,600	14,750	12,000								
51.22	A285	A	A	45,000		11,250											
51.22	A285	B	B	50,000		12,500											
51.22	A285	C	C	55,000		13,750											
Alloy steel:																	
51.04	A202	A	A	75,000		18,750	17,700	15,650	12,600								
51.04	A203	A, D	A, D	65,000		16,250	15,500	13,850	11,400								
51.04	A203	B, E	B, E	70,000		17,500	16,600	14,750	12,000								
51.04	A204	A	E	65,000	(3)	16,250	16,250	16,250	15,650	14,400	12,500						
51.04	A204	B	F	70,000	(3)	17,500	17,500	17,500	16,900	15,000	12,750						
51.04	A204	C	G	75,000	(3)	18,750	18,750	18,750	18,000	15,900	13,000						
51.04	A225	A	A	70,000		17,500	16,600	14,750	12,000								
51.04	A225	B	B	75,000		18,750	17,700	15,650	12,000								
51.04	A299		A	75,000		18,750	17,700	15,650	12,000								
51.04	A302	A	A	75,000	(3)	18,750	18,750	18,750	18,000	15,900	13,000						
51.04	A302	B	B	80,000	(3)	20,000	20,000	20,000	19,100	16,800	13,250						
51.04	A353	A and B	A and B	90,000		22,500											
51.04	A357		A	60,000		13,700	13,400	13,100	12,800	12,400	11,500	10,000	7,300	5,200			
51.04	A387	A	A	65,000	(4)	16,250	16,250	16,250	15,650	14,400	12,500	10,000					
51.04	A387	B	B	60,000	(4)	15,000	15,000	15,000	14,750	14,200	13,100	11,000	7,500	5,000			
51.04	A387	C,D	C,D	60,000	(4)	15,000	15,000	15,000	15,000	14,400	13,100	11,000	7,800	5,800			
51.04	A387	E	E	60,000	(4)	15,000	14,800	14,500	13,900	13,200	12,000	9,000	7,000	5,500			
51.22	A410			60,000		15,000											
High alloy steel:																	
51.23	A240	302	302	75,000	(4 5)	11,200	10,800	10,400									
51.23	A240	304	304	75,000	(4 5)	11,200	10,800	10,400	10,000	9,700	9,400	9,100	8,800	8,500	7,500	5,750	4,500
51.23	A240	304L	304L	70,000	(5)	8,700	8,500	8,300	8,100								
51.23	A240	309S	309S	75,000	(4 5)	16,450	16,400	16,200	15,700	14,900	13,800	12,500	10,500	8,500	6,500	5,000	3,800
51.23	A240	310S	310S	75,000	(4 5)	16,900	16,600	16,250	15,700	14,900	13,800	12,500	11,000	7,100	5,000	3,600	2,500
51.23	A240	316	316	75,000	(4 5)	17,050	17,000	16,900	16,750	16,500	16,000	15,100	14,000	12,200	10,400	8,500	6,800
51.23	A240	316L	316L	70,000	(5)	9,800	9,450	9,100	8,800	8,500							
51.23	A240	317	317	75,000	(4 5)	17,050	17,000	16,900	16,750	16,500	16,000	15,100	14,000	12,200	10,400	8,500	6,800
51.23	A240	321	321	75,000	(4 5)	14,850	14,800	14,700	14,450	14,300	14,100	13,850	13,500	13,100	12,500	8,500	6,800
51.23	A240	347	347	75,000	(4 5)	14,850	14,800	14,700	14,450	14,300	14,100	13,850	13,500	13,100	12,500	8,500	6,800
51.23	A240	348	348	75,000	(4 5)	14,850	14,800	14,700	14,450	14,300	14,100	13,850	13,500	13,100	12,500	8,500	6,800
51.23	A240	405	405	60,000	(5)	13,000	12,450	11,800	11,000	10,100	9,100	8,000	4,000				
51.23	A240	410	410	65,000	(4)	13,700	13,400	13,100	12,750	12,100	11,000	8,800	6,400	4,400			
51.23	A240	410S	410S	60,000	(4)	12,700	12,500	12,250	11,950	11,600	11,000	8,800	6,400	4,400			
51.23	A240	430A	430A	65,000	(4)	13,250	12,900	12,500	12,050	11,500	10,800	9,200	6,500	4,500			
51.23	A240	430B	430B	65,000	(4)	13,250	12,900	12,500	12,050	11,500	10,800	9,200	6,500	4,500			
PIPES AND TUBES																	
Seamless carbon steel:																	
51.25	A83		TS3	(47,000)	(5)	11,750	11,450	10,550									
51.25	A192		T192	(47,000)	(5)	11,750	11,450	10,550	9,000								
51.25	A210		T210	60,000		15,000	14,350	12,950	10,800								
51.25	A179		T179	(47,000)	(5 7)	11,750	11,450	10,550									
51.34	A53	A	P53-A	48,000		12,000	11,650	10,700									
51.34	A53	B	P53-B	60,000		15,000	14,350	12,950									
51.34	A106	A	P106-A	48,000		12,000	11,650	10,700	9,000								
51.34	A106	B	P106-B	60,000		15,000	14,350	12,950	10,800								
51.34	A106	C	P106-C	70,000	(5)	17,500	16,600	14,750	12,000								
Seamless alloy steel:																	
51.25	A200	T1	T1	55,000	(5)	13,750	13,750	13,750	13,450	13,150	12,500						
51.25	A209	T1a	T1a	60,000	(5)	15,000	15,000	15,000	14,400	13,750	12,500						
51.25	A209	T1b	T1b	53,000	(5)	13,250	13,250	13,250	13,000	12,750	12,500						
51.25	A213	T2	T2	60,000		15,000	15,000	15,000	14,400	13,750	12,500	10,000	6,500				
51.25	A213	T5	T5	60,000	(10)		13,400	13,100	12,800	12,400	11,500	10,000	7,300	5,200			
51.25	A213	T5b	T5b	60,000	(5)	13,700	13,400	13,100	12,800	12,400	10,900	9,000	5,500	3,500			
51.25	A213	T7	T7	60,000	(5)	13,700	13,400	13,100	12,500	11,500	9,500	7,000	5,000	3,500			
51.25	A213	T9	T9	60,000	(5)	13,700	13,400	13,100	12,800	12,500	12,000	10,800	8,500	5,500			
51.25	A213	T11	T11	60,000		15,000	15,000	15,000	15,000	14,400	13,100	11,000	7,800	5,500			
51.25	A213	T12	T12	60,000		15,000	15,000	15,000	14,750	14,200	13,100	11,000	7,500	5,000			
51.25	A213	T17	T17	60,000	(11)	15,000											
51.25	A213	T21	T21	60,000		15,000	14,800	14,500	13,900	13,200	12,000	9,000	7,000	5,500			
51.25	A213	T22	T22	60,000		15,000	15,000	15,000	15,000	14,400	13,100	11,000	7,800	5,800			
51.25	A213	TP304	T304	75,000	(4 5)	11,200	10,800	10,400	10,000	9,700	9,400	9,100	8,800	8,500	7,500	5,750	4,500
51.25	A213	TP304L	T304L	70,000	(5)	8,750	8,500	8,300	8,100								
51.25	A213	TP310	T310	75,000	(5)	16,900	16,600	16,750	15,700	14,900	13,800	12,500	11,000	7,100	5,000	3,600	2,500
51.25	A213	TP316	T316	75,000	(4 5)	17,050	17,000	16,900	16,750	16,500	16,000	15,100	14,000	12,200	10,400	8,500	6,800
51.25	A213	TP316L	T316L	70,000	(5)	9,800	9,450	9,100	8,800	8,500							
51.25	A213	TP321	T321	75,000	(4 5)	14,850	14,800	14,700	14,550	14,300	14,100	13,850	13,500				

See footnotes at end of table.

TABLE 52.05-10(a)—MAXIMUM ALLOWABLE STRESSES[1] FOR FERROUS MATERIALS—Continued

Specification subpart	A.S.T.M. designation	Grade		Minimum tensile strength p.s.i.	Notes	For metal temperatures not exceeding °F.[3]											
		A.S.T.M.	C.G.			650	700	750	800	850	900	950	1,000	1,050	1,100	1,150	1,200
PIPES AND TUBES—continued																	
Seamless alloy steel—Con.																	
51.25	A213	TP321H	T321H	75,000	(4 5)	14,850	14,800	14,700	14,550	14,300	14,100	13,850	13,500	13,100	12,500	8,000	5,000
51.25	A213	TP347	T347	75,000	(4 5)	14,850	14,800	14,700	14,550	14,300	14,100	13,850	13,500	13,100	12,500	8,000	5,000
51.25	A213	TP348	T348	75,000	(4 5)	14,850	14,800	14,700	14,550	14,300	14,100	13,850	13,500	13,100	12,500	8,000	5,000
51.25	A423			60,000		15,000											
51.34	A312	TP304	P304	75,000	(4 5)	11,200	10,800	10,400	10,000	9,700	9,400	9,100	8,800	8,500	7,500	5,750	4,500
51.34	A312	TP304L	P304L	70,000	(5)	8,750	8,500	8,300	8,100								
51.34	A312	TP309	P309	75,000	(4 5)	16,450	16,400	16,200	15,700	14,900	13,800	12,500	10,500	8,500	6,500	5,000	3,800
51.34	A312	TP310	P310	75,000	(4 5)	16,900	16,600	16,250	15,700	14,900	13,800	12,500	11,000	7,100	5,000	3,600	2,500
51.34	A312	TP316	P316	75,000	(4 5)	17,050	17,000	16,900	16,750	16,500	16,000	15,100	14,000	12,200	10,400	8,500	6,800
51.34	A312	TP316L	P316L	70,000	(5)	9,800	9,450	9,100	8,800	8,500							
51.34	A312	TP317	P317	75,000	(4 5)	17,050	17,000	16,900	16,750	16,500	16,000	15,100	14,000	12,200	10,400	8,500	6,800
51.34	A312	TP321	P321	75,000	(4 5)	14,850	14,800	14,700	14,550	14,300	14,100	13,850	13,500	13,100	12,500	8,000	5,000
51.34	A312	TP347	P347	75,000	(4 5)	14,850	14,800	14,700	14,550	14,300	14,100	13,850	13,500	13,100	12,500	8,000	5,000
51.34	A312	TP348	P348	75,000	(4 5)	14,850	14,800	14,700	14,550	14,300	14,100	13,850	13,500	13,100	12,500	8,000	5,000
51.34	A335	P1	P1	55,000	(5)	13,750	13,750	13,750	13,450	13,150	12,500						
51.34	A335	P2	P2	55,000		13,750	13,750	13,750	13,450	13,150	12,500	10,000	6,250				
51.34	A335	P5	P5	60,000	(5)	13,700	13,400	13,100	12,800	12,400	11,500	10,000	7,300	5,200			
51.34	A335	P5c	P5c	60,000	(5)	13,700	13,400	13,100	12,800	12,400	11,500	10,000	7,300	4,800			
51.34	A335	P7	P7	60,000	(5)	13,700	13,400	13,100	12,500	11,500	9,500	7,000	5,000	3,500			
51.34	A335	P9	P9	60,000	(5)	13,700	13,400	13,100	12,800	12,500	12,000	10,800	8,500	5,500			
51.34	A335	P11	P11	60,000		15,000	15,000	15,000	15,000	14,400	13,100	11,000	7,800	5,500			
51.34	A335	P12	P12	60,000		15,000	15,000	15,000	14,750	14,200	13,100	11,000	7,500	5,000			
51.34	A335	P15	P15	60,000		15,000	15,000	15,000	14,400	13,750	12,500	10,000	6,250				
51.34	A335	P21	P21	60,000		15,000	14,800	14,500	13,900	13,200	12,000	9,000	7,000	5,000			
51.34	A335	P22	P22	60,000		15,000	15,000	15,000	15,000	14,400	13,100	11,000	7,800	5,800			
Electric-resistance-welded pipe:																	
51.25	A178	A	T178-A	(47,000)	(6 12 13)	10,000	9,700	8,950									
51.25	A178	C	T178-C	60,000	(12 13)	12,750	12,200	11,000									
51.25	A226		T226	47,000	(6 12 13)	10,000	9,700	8,950	7,800								
51.25	A250	T1	T1-RW	55,000	(2 12)	11,700	11,700	11,700	11,450	11,200	10,650						
51.25	A250	T1a	T1a-RW	60,000	(2 12)	12,750	12,750	12,750	12,750	11,700	10,650						
51.25	A250	T1b	T1b-RW	53,000	(2 12)	11,250	11,250	11,250	11,050	10,850	10,650						
51.25	A423		T423-RW	60,000	(12)	12,750											
51.34	A53	A	P53-RW-A	48,000	(12)	10,200											
51.34	A53	B	P53-RW-B	60,000	(12)	12,750											
51.34	A135	A	P135-A	48,000	(12)	10,200											
51.34	A135	B	P135-B	60,000	(12)	12,750											
51.34	A312	TP304	P304-RW	75,000	(4 5 12)	9,500	9,200	8,850	8,500	8,250	8,000	7,750	7,500	7,200	6,400	4,900	3,800
51.34	A312	TP304L	P304L-RW	75,000	(5 12)	7,450	7,200	7,050	6,900								
51.34	A312	TP309	P309-RW	75,000	(5 12)	14,000	13,950	13,800	13,350	12,700	11,700	10,600	8,900	7,200	5,500	4,250	3,250
51.34	A312	TP310	P310-RW	75,000	(4 5 12)	14,400	14,100	13,800	13,350	12,700	11,700	10,600	9,350	6,000	4,250	3,050	2,100
51.34	A312	TP316	P316-RW	75,000	(4 5 12)	14,500	14,450	14,350	14,250	14,000	13,600	12,800	11,900	10,400	8,850	7,200	5,800
51.34	A312	TP316L	P316L-RW	70,000	(5 12)	8,350	8,050	7,750	7,500	7,200							
51.34	A312	TP317	P317-RW	75,000	(4 5 12)	14,500	14,450	14,350	14,250	14,000	13,600	12,800	11,900	10,400	8,850	7,200	5,800
51.34	A312	TP321	P321-RW	75,000	(4 5 12)	12,650	12,600	12,500	12,350	12,150	12,000	11,800	11,500	11,100	10,600	6,800	4,250
51.45	A312	TP347	P347-RW	75,000	(4 5 12)	12,650	12,600	12,500	12,350	12,150	12,000	11,800	11,500	11,100	10,600	6,800	4,250
51.45	A312	TP348	P348-RW	75,000	(4 5 12)	12,650	12,600	12,500	12,350	12,150	12,000	11,800	11,500	11,100	10,600	6,800	4,250
FORGINGS																	
Carbon steel:																	
51.46	A105	I	F105-I	60,000		15,000	14,350	12,950	10,800								
51.46	A105	II	F105-II	70,000		17,500	16,600	14,750	12,000								
51.46	A181	I	F181-I	60,000		15,000	14,350	12,950	10,800								
51.46	A181	II	F181-II	70,000		17,500	16,600	14,750	12,000								
Alloy steel:																	
51.46	A182	F1	F1	70,000	(5)	17,500	17,500	17,500	16,900	15,000	12,750						
51.46	A182	F5	F5	60,000	(10)		13,400	13,100	12,800	12,400	11,500	10,000	7,300	5,200			
51.46	A182	F5a	F5a	90,000	(5)	19,000	17,500	16,000	14,500	13,000	11,500	10,000	7,300	5,200			
51.46	A182	F6	F6-410	85,000	(5)	17,900	17,500	17,050	16,300	14,000	11,000	8,800	6,400	4,400			
51.46	A182	F7	F7	60,000	(5)	13,700	13,400	13,100	12,500	11,500	9,500	7,000	5,000	3,500			
51.46	A182	F9	F9	100,000	(5)	22,000	21,200	20,000	17,700	15,400	13,100	10,800	8,500	5,500			
51.46	A182	F11	F11	70,000	(5)	16,800	16,150	15,500	15,000	14,400	13,100	11,000	7,800	5,500			
51.46	A182	F12	F12	70,000	(10)	16,800	16,150	15,500	14,850	14,200	13,100	11,000	7,500	5,000			
51.46	A182	F21	F21	70,000	(5)	15,600	15,100	14,600	13,900	13,200	12,000	9,000	7,000	5,500			
51.46	A182	F22	F22	70,000		17,500	17,500	17,500	17,500	16,000	14,000	11,000	7,800	5,800			
51.46	A182	F304	F304	75,000	(4 5)	11,200	10,800	10,400	10,000	9,700	9,400	9,100	8,800	8,500	7,500	5,750	4,500
51.46	A182	F304L	F304L	65,000	(5)	8,750	8,500	8,300	8,100								
51.46	A182	F310	F310	95,000	(4 5)	16,900	16,600	16,250	15,700	14,900	13,800	12,500	11,000	7,100	5,000	3,600	2,500
51.46	A182	F316	F316	75,000	(4 5)	17,050	17,000	16,900	16,750	16,500	16,000	15,100	14,000	12,200	10,400	8,500	6,800
51.46	A182	F316L	F316L	65,000	(5)	9,800	9,450	9,100	8,800	8,500							
51.46	A182	F321	F321	75,000	(4 5)	14,850	14,800	14,700	14,550	14,300	14,100	13,850	13,500	13,100	12,500	8,000	5,000
51.46	A182	F347	F347	75,000	(4 5)	14,850	14,800	14,700	14,550	14,300	14,100	13,850	13,500	13,100	12,500	8,000	5,000
51.46	A182	F348	F348	75,000	(4 5)	14,850	14,800	14,700	14,550	14,300	14,100	13,850	13,500	13,100	12,500	8,000	5,000
51.46	A336	F1	F1	70,000	(5)	17,500	17,500	17,500	16,900	15,000	12,750						
51.46	A336	F2	F2	70,000	(5 10)	16,800	16,150	15,500	14,850	14,200	13,100	11,000	7,500	5,000			
51.46	A336	F5	F5	60,000	(5 10)	13,700	13,400	13,100	12,800	12,400	11,500	10,000	7,300	5,200			
51.46	A336	F5a	F5a	90,000	(5 10)	17,300	16,500	15,500	14,500	13,000	11,500	10,000	7,300	5,200			
51.46	A336	F6	F6-410	75,000	(5)	15,700	15,400	15,100	14,650	14,000	11,000	8,800	6,400	4,400			
51.46	A336	F22	F22	70,000	(10)	17,500	17,500	17,500	17,500	16,000	14,000	11,000	7,800	5,800			
51.46	A336	F8	F8-304	75,000	(4 5)	11,200	10,800	10,400	10,000	9,700	9,400	9,100	8,800	8,500	7,500	5,750	4,500
51.46	A336	F8m	F8m-316	75,000	(4 5)	17,050	17,000	16,900	16,750	16,500	16,000	15,100	14,000	12,200	10,400	8,500	6,800
51.46	A336	F8c	F8c-347	75,000	(4 5)	14,850	14,800	14,700	14,550	14,300	14,100	13,850	13,500	13,100	12,500	8,000	5,000
51.46	A336	F8t	F8t-321	75,000	(4 5)	14,850	14,800	14,700	14,550	14,300	14,100	13,850	13,500	13,100	12,500	8,000	5,000
51.46	A336	F25	F25-310	95,000	(4 5)	20,850	20,000	18,500	17,000	15,500	14,000	12,500	11,000	9,750	8,500	7,250	6,000

See footnotes at end of table.

TABLE 52.05-10(a)—MAXIMUM ALLOWABLE STRESSES [1] FOR FERROUS MATERIALS—Continued

Specification subpart	A.S.T.M. designation	Grade		Minimum tensile strength p.s.i.	Notes	For metal temperatures not exceeding °F.[2]											
		A.S.T.M.	C.G.			650	700	750	800	850	900	950	1,000	1,050	1,100	1,150	1,200
BOLTING																	
Carbon steel:																	
51.49	A307		B	55,000	(16)	7,000											
Alloy steel:																	
51.49	A193	B5	B5		(16)	20,000	20,000	20,000	20,000	17,250	13,750	10,300	7,300				
51.49	A193	B6	B6		(16)	20,000	18,400	16,700	14,200	11,800	8,400						
51.49	A193	B7	B7		(16)	20,000	20,000	20,000	20,000	16,250	12,500						
51.49	A193	B14	B14		(16)	20,000	20,000	20,000	20,000	18,750	16,650	14,250	11,000	6,250			
51.49	A193	B16	B16		(16)	20,000	20,000	20,000	20,000	18,750	16,650	14,250	11,000	6,250			
51.49	A193	B8C	B8C			11,850	11,800	11,750	11,650	11,450	11,300	11,100	10,800	10,500	10,000	8,000	5,000
51.49	A193	B8T	B8T			11,850	11,800	11,750	11,650	11,450	11,300	11,100	10,800	10,500	10,000	8,000	5,000
CASTINGS																	
Carbon steel:																	
51.58	A216	WCA	WCA	60,000	(17)	15,000	14,350	12,950	10,800								
51.58	A216	WCB	WCB	70,000	(17)	17,500	16,600	14,750	12,000								
Alloy steel:																	
51.58	A217	WC1	WC1	65,000	(3 17 18)	16,250	16,250	16,250	15,650	14,400	12,500						
51.58	A217	WC4	WC4	70,000	(17 18)	17,500	17,500	17,500	17,000	15,800	14,000						
51.58	A217	WC5	WC5	70,000	(17 18)	17,500	17,500	17,500	17,000	15,800	14,000	11,000	7,800	5,500			
51.58	A217	WC6	WC6	70,000	(17 18)	17,500	17,500	17,500	17,000	15,800	14,000	11,000	7,800				
51.58	A217	WC9	WC9	70,000	(17 18)	17,500	17,500	17,500	17,000	15,800	14,000	11,000	7,800	5,800			
51.58	A217	C5	C5	90,000	(17)	22,500	21,600	20,400	19,000	17,000	13,600	10,000	7,300				
51.58	A217	C12	C12	90,000	(17)	22,500	22,000	21,000	19,400	17,300	15,000	11,750	8,500				
51.58	A351	CA15	CA15	90,000	(17)	21,600	20,700	19,600	18,300	16,000	11,000	7,600	5,000	3,300	2,200	1,500	1,000
51.58	A351	CF8	CF8	70,000	(4 8 17)	11,500	11,300	11,100	10,900	10,650	10,400	10,100	9,850	9,600	7,500	5,700	4,500
51.58	A351	CF8M	CF8M	70,000	(4 8 17)	15,000	14,700	14,350	14,000	13,500	13,000	12,350	11,700	10,600	9,400	8,000	6,800
51.58	A351	CF8C	CF8C	70,000	(4 8 17)	11,900	11,700	11,600	11,500	11,350	11,200	11,100	11,000	10,900	10,800	8,000	5,000
51.58	A351	CH20	CH20	70,000	(4 8 17)	14,400	14,350	14,300	14,150	13,900	13,500	12,500	10,500	8,500	6,500	5,000	3,800
51.58	A351	CK20	CK20	65,000	(4 8 17)	14,400	14,350	14,300	14,150	13,900	13,500	12,500	11,000	9,750	8,500	7,250	6,000

[1] In general, the allowable "S" values in Table 52.05-10(a) except for welded pipe and tubing, and bolting, are based on one-fourth of the minimum of the specified tensile range of the material for temperatures of 650° and below; and on creep stress or stress-rupture for temperatures above 650° F.

[2] Intermediate values of "S" may be obtained by interpolation.

[3] Carbon-molybdenum alloy-steel plate, pipe, forging, and cast material shall be limited to a maximum temperature of 875° F.

[4] These stress values apply only when carbon content is 0.04 percent or higher.

[5] Higher values of maximum allowable stress for temperatures between 0° F. and 650° F. will be considered based on the proposed application.

[6] The minimum tensile strength employed not given in the specification; tensile strength value assumed.

[7] Permitted only for use as tube material in heat exchangers and tubing for hydraulic systems.

[8] This material limited to the construction of superheater, waterwall and economizer headers when used in boilers. Where welding fabrication is employed, a minimum preheat temperature of 300° F. shall be used.

[9] This material shall be limited to a temperature of 875° F. when used in the design of pressure vessels.

[10] Maximum allowable stress values for temperatures below 700° F. are as follows:

A.S.T.M. designation	Grade	For metal temperatures not exceeding °F.			
		−20 to 400	500	600	650
A213	T5	15,000	14,500	14,000	13,700
A182	F12	17,500	17,500	17,500	16,800
A182	F5	22,500	21,600	20,100	19,000

[11] Maximum allowable stress values for temperatures exceeding 650° F. will be considered based on the proposed application.

[12] These stresses include weld joint efficiency of 0.85.

[13] When material conforming to this specification is used in boiler, waterwall, economizer, and superheater tubes that are fully enclosed within the boiler setting, and in heat exchanger tubes, the maximum allowable stress may be used without weld joint efficiency of 0.85.

[14] Welding or brazing not permitted on liquid quenched and tempered materials.

[15] This stress not permitted for temperatures exceeding 450° F.

[16] Between temperatures of −20° to 400° F., stress values equal to the lower of the following will be permitted; 20 percent of the minimum tensile strength or 25 percent of the minimum yield strength.

[17] To these stresses a quality factor as specified in § 52.05-13 shall be applied.

[18] These stresses apply to the normalized material only.

§ 52.05-12 Maximum allowable stress.

(a) The maximum allowable stresses given in Tables 52.05-10 (a) and 54.03-10 (c) in Part 54 of this subchapter may be used in the formulas for determining the maximum allowable pressure and the minimum thickness of seamless or arc-welded shells which do not require staying, unstayed blank hemispherical and ellipsoidal heads with the pressure on the concave side, flat heads which do not require staying, bolting flanges, and reinforced openings in shells and heads of boilers and unfired pressure vessels, provided the fabrication complies with the following requirements:

(1) The pressure parts of boilers shall have a minimum thickness exceeding ½ inch, and to the calculated thickness as determined by the applicable design formula, a corrosion allowance of 0.1 inch shall be added.

(2) The pressure parts of unfired pressure vessels shall have a corrosion allowance of one-sixth of the calculated thickness, or 1/16 inch, whichever is smaller, added to the calculated thickness as determined by the applicable design formula, except that no additional thickness need be provided when acceptable corrosion resistant materials are employed.

(3) Backing strips fitted in way of longitudinal joints shall be removed and the weld surface and reinforcement of longitudinal and circumferential joints shall be prepared in accordance with § 56.05-5 (c) of this subchapter. For cylindrical shells subject to temperatures exceeding 800° F., all weld reinforcement on both the inside and outside of the shell at the longitudinal and circumferential joints shall be removed wherever possible.

(4) Class II welded pressure vessels which are not given a complete radiographic examination shall have portions of the welded joints examined by spot radiography as required by § 56.05-6 of this subchapter.

(5) The stresses due to hydrostatic head shall be taken into account in determining the minimum thickness of the shell or head of any pressure vessel. Additional stresses, imposed by effects other than internal pressure or static head, which increase the average stress over substantial sections of the shell or head by more than 10 percent of the allowable stress shall be taken into account. These effects include the weight of the vessel and its contents, method of support, impact loads, superimposed loads, localized stresses due to the reactions of supports, and stresses due to temperature gradient.

(b) The maximum allowable stress used in the formulas for determining the maximum allowable pressure and minimum thickness of the following pressure parts of boilers and unfired pressure vessels shall not exceed 80 percent of the values given in Tables 52.05–10 (a) and 54.03–10 (c) in Part 54 of this subchapter:

(1) Boiler shell or head thicknesses of ½ inch or less.

(2) Riveted or brazed shells or heads.

(3) Dished heads, other than hemispherical or ellipsoidal.

(4) Unstayed hemispherical or ellipsoidal heads with pressure on the convex side.

(5) Hemispherical and ellipsoidal heads with flanged-in or other unreinforced manholes.

(6) All stays, braces or parts requiring staying.

(c) Where the maximum allowable stress is limited to 80 percent of the values given in Table 52.05–10 (a) or 54.03–10 (c) in Part 54 of this subchapter, compliance with the provisions of paragraph (a) of this section is not required.

§ 52.05–13 Quality factors for steel castings.

(a) A quality factor as specified in this section shall be applied to the allowable stresses for steel casting materials as given in Table 52.05–10 (a), when used in special design of pressure parts.

(b) A factor not to exceed 80 percent shall be applied when a casting is produced only in accordance with the material specifications given in Subpart 51.58 of this subchapter.

(c) A factor not to exceed 90 percent may be used for castings which have been radiographed at all critical sections [1] and found free of injurious defects.

(d) Radiographing, where required shall conform to the requirements of § 56.05–5 of this subchapter.

(e) Serious defects shall be the basis for rejection of the casting. Defects which are not considered as impairing the strength of the castings may be repaired by welding in accordance with the applicable requirements of this subchapter for welding repairs to defective carbon-steel or alloy-steel castings.

(f) Castings to which a quality factor exceeding 80 percent is to be applied shall be marked as required by Subpart 51.58 of this subchapter, and in addition, the applicable quality factor shall be clearly stamped on the casting.

§ 52.05–15 Seamless pipe shells.

(a) Shells may be seamless pipe or tubing with or without integral heads for boilers and unfired pressure vessels provided the material conforms to Subpart 51.25 or 51.34 of this subchapter, except that Grades T83, P53–A and P–53B shall not be used for boiler shells exceeding 18 inches in diameter.

§ 52.05–20 Electric-resistance welded pipe shells.

(a) Shells may be fabricated of electric-resistance welded pipe or tubing made of open-hearth or electric furnace steel, as specified in Subpart 51.25 or 51.34 of this subchapter, not exceeding 24 inches in diameter for boiler shells and 30 inches in diameter for unfired pressure vessel shells. The maximum allowable stress values in Table 52.05–10(a) shall be substituted in Formulas (1) or (2) of § 52.05–10 for the values of SE.

(b) Holes for tubes, nozzles, or other openings shall not be drilled in the weld.

§ 52.05–30 Externally fired boilers.

The thickness of shell plates of externally fired boilers shall not exceed 0.45 inch.

Subpart 52.10—Shell Joints

§ 52.10–1 Type of shell joints.

The shells of boilers or unfired pressure vessels may be fabricated by riveting or welding.

§ 52.10–5 Materials and workmanship.

(a) The buttstraps of riveted joints shall be of steel conforming with the specifications and requirements for the shell plates.

(b) Rivets shall conform to the requirements of Part 51 of this subchapter, as follows:

Steel rivets	Subpart 51.07
Iron rivets	Subpart 51.13

(c) Rivet holes shall be drilled wholly and fairly, preferably in position. After drilling, plates and straps shall be disassembled, burrs removed, and edges of holes faired before the plates are riveted together. Drifting of rivet holes is prohibited.

(d) The calking edges of plates, buttstraps, and heads shall be beveled to an angle not sharper than 70° to the plane of the plate and as near thereto as practicable. Every portion of the unfinished surfaces of the calking edges of plates, buttstraps, and heads shall be planed or milled to a depth of not less than ¼ of the thickness of the plate, but in no case less than ⅛ inch. Calking shall be done with a tool of such form that there is no danger of scoring or damaging the plate underneath the calking edge, or splitting the calked sheet.

(e) Plates and shapes shall be so closely fitted, metal to metal, as to require a minimum of calking to obtain tightness.

(f) The seal welding of rivet heads to secure tightness is prohibited.

§ 52.10–8 Longitudinal riveted joints.

(a) The longitudinal joints of drums and shells of all boilers shall be of riveted double-butt strap construction, at least double-riveted.

(b) The longitudinal joints of externally fired fire-tube or flue boilers shall be located above the fire line of the setting.

(c) Boiler shell plates having longitudinal joints shall be rolled or formed by pressure, not blows, to the proper curvature.

(d) The maximum allowable pitch of rivets in longitudinal joints shall be such as to insure good calking.

(e) The distance between the center lines of any two adjacent rows of rivets in longitudinal joints or the "back pitch" measured at right angles to the direction of the joint, shall have the following minimum values:

(1) If $\frac{P}{d}$ is 4 or less, the minimum value shall be: 2d, or

(2) If $\frac{P}{d}$ is over 4, the minimum value shall be: $2d+0.1(P-4d)$

where:

P = Pitch of the rivets in outer row where a rivet in the inner row is located midway between two rivets in the outer row, in inches, or

P^1 = pitch of rivets in the outer row less pitch of rivets in the inner row where two rivets in the inner row is located between two rivets in the outer row, in inches.

d = diameter of the rivet holes, in inches.

(3) The "back pitch" of rivets shall be measured either on the flat plate before rolling or on the median line after rolling. The "back pitch" thus measured shall govern the locations of the rivet holes in the buttstraps. The diagonal ligaments between staggered rivets shall have the proper strength, as determined by figure 52.40–5 (c4).

(f) On longitudinal joints the distance from the center of rivet holes to the edge of the plate, except rivet holes in the ends of buttstraps, shall be not less than 1½ and not more than 1¾ times the diameter of the rivet holes, the distance to be measured from the center of the rivet holes to the calking edge of the plate before calking.

§ 52.10–10 Efficiency of riveted joints.

(a) The efficiency of riveted joints is the ratio which the strength of the joint bears to the strength of the solid plate. The efficiency of a riveted joint is determined by calculating the breaking strength of a unit section of the joint, considering each possible mode of failure separately, and dividing the lowest result by the breaking strength of the solid plate of a length equal to that of the section considered. It shall be computed in accordance with the following formulas:

(1) For plate section:

$$E=\frac{P-d}{P} \qquad (1)$$

(2) For rivet section:

$$E=\frac{Nas}{PST} \qquad (2)$$

(3) For combined efficiency of plate in second row and shearing strength of rivet in outer row:

$$E=\frac{p-d}{p}+\frac{nas}{PST} \qquad (3)$$

[1] Critical sections of a casting are defined as the sections where defects are usually encountered, such as the junction of risers, gates, or feeders to the castings, and at abrupt changes in section. All integrally cast bosses and all chaplets and internal chills shall be radiographed.

[1] It is assumed that the joints are of the usual construction where the rivets are symmetrically spaced.

(4) For combined efficiency of plate in second row and crushing strength of buttstrap in front of rivet in outer row:

$$E=\frac{p-d}{p}+\frac{ncdt}{PST} \quad (4)$$

where:

E = efficiency of riveted joint in ratio to solid plate.
P = pitch in inches of rivets in outer row.
p = pitch in inches of rivets in second row.
d = diameter of rivet hole, in inches.
N = total number of rivets per pitch P.
n = number of rivets in outer row per pitch P.
T = thickness of shell plate, in inches.
t = thickness of buttstrap, in inches.
a = sectional area of the driven rivet, in square inches.
c = crushing strength of plate in front of rivets. (Assumed as 95,000 pounds per square inch.)
S = tensile strength of plate in pounds per square inch.
s = shearing strength of rivets in pounds per square inch of sectional area, assumed as follows:

Iron rivets in single shear	38,000
Iron rivets in double shear	76,000
Steel rivets, grade A, in single shear	44,000
Steel rivets, grade A, in double shear	88,000
Steel rivets, grade B, in single shear	52,000
Steel rivets, grade B, in double shear	104,000
Alloy-steel rivets, grade C, in single shear	60,000
Alloy-steel rivets, grade C, in double shear	120,000

(b) Where the drums of water-tube boilers are pierced through the longitudinal buttstrap joint for the purpose of inserting tubes to connect the headers to the drum, the combined thickness of both buttstraps shall be taken in computing the efficiency of the ligament between tube holes. This efficiency shall in no case be less than that required for the riveted joint.

§ 52.10–15 Buttstraps and computations.

(a) The thickness of buttstraps shall be such as to permit efficient calking of the edges. Where the pitch of the rivets is so great as to make effective calking doubtful, as occurs in quadruple riveting, the edge should be scalloped around the outer rivets.

(b) The thickness of the outer buttstrap shall be not less than that determined by the following formula, but it shall in no case be less than ¼ inch:

$$t=\frac{5T(P-d)}{8(P-Kd)} \quad (1)$$

where:

t = thickness of outer strap, in inches.
T = required thickness of shell plate, in inches.
P = pitch of rivets in outer rows, in inches.
d = diameter of rivet holes, in inches.
K = ratio of pitch of rivets in outer row to minimum pitch in inner rows.

(c) The thickness of the inner buttstrap shall equal t plus 0.125 inch, but is not required to exceed the thickness of the shell plate.

(d) The thickness of buttstraps on drums of water-tube boilers pierced for the purpose of inserting tubes to connect the headers to the drums, shall be increased if necessary to maintain the efficiency on which the allowable pressure is based.

(e) Buttstraps shall be formed to the curvature of the shell by rolling or pressing.

§ 52.10–20 Circumferential joints.

(a) The minimum strength of circumferential joints attaching shells to heads of boilers or other pressure vessels shall bear the following ratios to that required for the longitudinal joints of the shell:

(1) Fifty percent when no part of the load on the head is supported by either tubes or stays.

(2) Forty percent when one-half or more of the load on the head is sustained by stay tubes, flues, or stays; except that circumferential head joints of externally fired fire-tube or flue boilers exposed to fire or to the products of combustion, shall have a minimum strength of not less than 50 percent of that of the longitudinal joint.

(b) The strength of the circumferential joints connecting courses of the shell shall be not less than 75 percent of that required for the longitudinal joints of the shell except that in the case of externally fired flue boilers the strength of circumferential joints need not exceed 60 percent of the strength of the longitudinal joint.

(c) Circumferential end joints of shell plates over ⅝ inch thick and circumferential joints connecting courses of shells, the required thickness of which is over ½ inch, shall be at least double riveted. Where the thickness of the shell plate exceeds 1⅜ inches for single-ended boilers, and 1⅜₁₆ inches for double-ended boilers, the circumferential seams connecting shell courses shall be triple riveted.

(d) On circumferential joints of shells having heads which are not supported by tubes or through stays, the distance from the center of rivet holes to the calking edges of the plates, shall be not less than 1½ and not more than 1¾ times the diameter of the rivet holes. The distance from the centers of rivet holes of circumferential joints to the edges of the plate in boilers having heads which are supported by tubes or through stays shall not be less than 1¼ times the diameter of the rivet holes.

(e) The distance between any two rows of rivets in a circumferential joint or the "back pitch" shall be not less than 1¾ times the diameter of the rivet hole.

§ 52.10–25 Welded joints.

(a) Drums, shells, or other cylindrical pressure parts and non-cylindrical pressure parts of boilers and unfired pressure vessels, except stays or braces as specified in Subpart 52.35, may be fabricated by means of arc or gas welding, provided the construction meets the requirements for material and design as specified in Parts 51 and 52 of this subchapter, and the welding conforms to the requirements of Part 56 of this subchapter.

(b) Arc or gas welding used in the fabrication of the pressure parts of boilers, as specified in paragraph (a) of this section, need not be radiographed, unless otherwise specified in this subchapter, provided the stress or load is carried by other construction which conforms to the requirements of the regulations in this subchapter, such as stays, staybolts, and stay tubes, and where the adequacy of the boiler design is not solely dependent upon the strength of the weld. Welding done under these provisions shall otherwise conform in all respects to Part 56 of this subchapter, unless otherwise specified in this subchapter.

(c) Arc or gas welding is permitted in the construction of boilers and unfired pressure vessels for the purpose of securing tightness in parts of riveted joints which are otherwise constructed fully in accordance with the regulations in this subchapter.

(d) The ends of inner butt-straps of riveted butt-strap longitudinal joints may be arc- or gas-welded to the edges of heads or of the adjoining shell plate, or to the circumferential butt-straps for tightness. When the butt-strap of a longitudinal joint does not extend the full length of the shell plates, the abutting edges of the shell plate may be welded provided the distance from the end of the butt-strap to the edge of the flange of the head or adjacent shell plate is not greater than 2½ inches.

(e) The longitudinal and circumferential joints of corrugated furnaces may be fabricated by arc welding in accordance with the requirements of § 52.50–15 (g).

(f) (1) A furnace in a fire-tube boiler may be attached to an outwardly flanged opening in a front tube sheet by a circumferential fillet weld, or, the furnace may be attached to either tube sheet by flaring the end which extends beyond the outside face of the head to an angle of 20 to 30 degrees, and using a circumferential fillet weld, provided:

(i) The area of the heads around the furnace is stayed by tubes or braces in accordance with the requirements of Subpart 52.35.

(ii) The joint is wholly outside the furnace.

(iii) The throat of the full fillet weld is not less than 0.7 times the thickness of the head.

(iv) Unless protected by refractory material, the furnace shall not extend beyond the outside face of the tube sheet a distance greater than the thickness of the tube sheet. Any excess shall be removed before welding.

(v) The welding conforms in all respects to Part 56 of this subchapter, except that radiographic examination is not required.

(2) A furnace may also be attached by a full penetration weld, provided the furnace extends through the full thickness of the tube sheet. The furnace shall not extend beyond the toe of the weld and the toe shall not project beyond the face of the tube sheet by more than ⅜ inch.

(g) Arc- or gas-welded construction may be used in lieu of riveted joints in

the fire boxes of internally-fired boilers provided the welds are located between two rows of staybolts, or in the case of flat surfaces, the weld is not less than one half of a staybolt pitch from the corner of the knuckle.

(h) The bottom edges of plates of vertical tubular and firebox types of boilers may be attached by full penetration butt welds provided the load due to internal pressure is carried by staybolting and the inside width of the waterleg does not exceed 4 inches. The plates may be considered as fully supported if the distance from the welds to the nearest row of staybolts is not more than one-half the pitch allowed by Subpart 52.35.

(i) Mud rings of plate material may be used in the construction of waterlegs of vertical fire-tube boilers and may be attached as shown in figure 52.22-10 (E), provided the width of the waterleg does not exceed 4 inches, and the thickness of the mud ring plate is at least ½ inch. The welding shall be stress-relieved, but radiographic examination is not required.

(j) Fire-tube boilers may be constructed by attaching an unflanged tube sheet to the shell or wrapper sheet by welding provided that:

(1) The tube sheet is supported by tubes or braces, or both, in accordance with the requirements of Subparts 52.30 and 52.35.

(2) The welded joint is wholly within the shell or wrapper sheet and forms no part thereof.

(3) The weld is a full penetration weld, of at least the full thickness of the tube sheet, applied from either or both sides.

(4) The shell or wrapper sheet, where exposed to primary furnace gases and not water cooled, does not extend more than ⅛ inch beyond the outside face of the tube sheet.

(5) The weld attaching a furnace or lower tube sheet of a vertical fire-tube boiler to the furnace sheet is wholly within the furnace sheet and ground flush with the upper or water side of the tube sheet.

(6) The welding conforms in all respects to Part 56 of this subchapter, except that radiographic examination is not required.

(7) This construction shall not be used on the rear head of a horizontal-return tubular boiler.

Subpart 52.15—Domes and Steam Chimneys

§ 52.15-1 Definitions.

(a) *Domes.* Domes are superstructures of shells, attached by riveting or welding. They generally consist of a cylindrical shell with one end flanged for attachment to the main shell and the other end closed by a head which may be integral with, riveted, or welded to the shell.

(b) *Steam chimneys.* Steam chimneys are superstructures of steam boilers which are fitted with a lining inside of which the products of combustion pass to the smokestack. They may be constructed in the form of a dome integral with the boiler or as independent steam vessels connected by piping to the boiler.

§ 52.15-5 Materials and workmanship.

(a) Steel plates used in the construction of domes and steam chimneys shall conform to the specifications and requirements for the shell plates.

(b) Rivets shall conform to the requirements of Part 51 as follows:

Steel rivets	Subpart 51.07
Iron rivets	Subpart 51.13

§ 52.15-10 Computations.

(a) The maximum allowable pressure and the minimum thickness of the shell of domes and steam chimneys shall be computed as specified for cylindrical shells in Subpart 52.05, employing the minimum efficiency of the joint.

(b) Flat surfaces of heads of domes and steam chimneys shall be stayed as specified for surfaces to be stayed or reinforced in Subparts 52.30 and 52.35.

(c) The maximum allowable pressure on unstayed steam chimney linings, or the minimum thickness of such linings, shall depend upon their type and shall be computed in accordance with the requirements for furnaces and flues specified in Subpart 52.50.

(d) A cylindrical surface exposed to external pressure and not entirely self-supporting shall be stayed in accordance with the requirements of Subparts 52.30 and 52.35, specifically § 52.30-10 (g).

(e) The strength of the rivets and of ligaments between rivets in the flange attaching a dome or steam chimney to a main shell shall be sufficient to give a factor of safety of not less than six against the full load acting on the head. This factor of safety may be reduced to not less than four when not less than 50 percent of the load on the head is carried by stays secured to the main shell.

(f) Domes attached to shells of boilers shall comply with the requirements for reinforced openings as specified in Subpart 52.25.

§ 52.15-15 Detail requirements.

(a) All domes and steam chimneys shall be so arranged that any water can drain back into the boiler.

(b) The diameter of a dome shall not exceed one-half of the diameter of the boiler shell.

(c) Flanges of domes shall be formed with a corner radius of at least twice the thickness of the plate for plates 1 inch in thickness or less, and at least three times the thickness of the plate, for plates over 1 inch in thickness.

(d) The longitudinal joints of a dome or steam chimney may be butt-welded and the dome flange may be double full-fillet lap-welded to shell, in lieu of riveting, provided the welding fully complies with the requirements of Part 56 of this subchapter, except that radiographic examination of the fillet welds may be omitted.

Subpart 52.20—Dished Heads

§ 52.20-1 Definitions.

(a) *Unstayed heads.* Unstayed heads are the ends of a pressure vessel shell. They may be either flat or dished. Heads may be integral with, riveted or welded, to the shell.

(b) *Dished heads.* Dished heads are heads formed to a segment of a sphere or to a hemispherical or elliptical section and may be attached to the shell so that the pressure will be either on the concave or on the convex side.

§ 52.20-5 Materials and workmanship.

(a) Steel plate used in the fabrication of dished heads shall conform to the specifications and requirements for the shell plates. Welding caps, conforming to the requirements of subpart 51.34 of this subchapter may be used as end closures in water drums and headers, provided the diameter does not exceed 24 inches. Flanged or dished heads if pressed or flanged cold shall be stress-relieved as required by § 56.01-70 of this subchapter after the cold forming operations are completed. Heads that are flanged or dished hot need not be stress-relieved.

NOTE: It is not mandatory in fresh and salt water service systems that flanged or dished heads be stress-relieved for use on compression tanks with an air cushion containing liquids operating at temperatures not exceeding 212° F.

(b) The inside radius of the bend of the flange formed on an unstayed dished head shall be not less than three times the thickness of the head and shall in no case be less than 6 percent of the outside diameter of the flanged portion of the head.

(c) Dished heads having the pressure on the convex side shall be formed to a true surface without flats.

(d) The heads here considered are of steel plate. Cast-steel, bronze and cast-iron heads may be used for unfired pressure vessels, but only where specifically authorized by the Commandant.

(e) The edge of the flange formed on a head shall be machined to a true surface. Where the flange is to be calked inside, the edge shall be beveled as specified for the edges of plates and straps in § 52.10-5. Care shall be taken in calking to avoid damaging the surface of the plate.

(f) The holes for rivets to attach the head to the shell shall, as far as practicable, be drilled in position, and the shell and head shall be taken apart after the holes are drilled, and burrs removed. In cases where holes cannot be drilled in position, the holes shall be examined after assembly and faired by reaming where necessary. (The requirements to take apart shell and head for removing burrs shall not apply to heads where the contact surfaces have been machined and the heads shrunk in place.)

§ 52.20-10 Computations.

(a) The maximum allowable pressure and the minimum thickness of blank unstayed spherically dished heads, hemispherical heads, or ellipsoidal heads having the pressure on the concave side shall be calculated by the following formulas:

(1) *Spherically dished heads.*

$$P=\frac{STE}{0.833R} \quad (1)$$

$$T=\frac{0.833PR}{SE} \quad (2)$$

(2) *Hemispherical heads.*

$$P=\frac{2STE}{R} \quad (3)$$

$$T=\frac{PR}{2SE} \quad (4)$$

where:

P = maximum allowable pressure, in pounds per square inch.

S = maximum allowable stress, in pounds per square inch, taken from tables 52.05–10 (a) and 54.03–10 (c), and subject to the limitations of § 52.05–12.

T = minimum thickness of the head, in inches.

E = efficiency of the weakest joint used in forming the head, including the head to shell joint for hemispherical heads only, for the following types:

Riveted joints = calculated riveted efficiency, § 52.10–10.

Welded joints = efficiency specified in table 56.01–30 (a).

Seamless shells with integral heads = 100 percent.

R = radius to which the head is dished or formed, measured on the concave side, in inches.

(3) *Ellipsoidal heads.* A blank head of a semi-ellipsoidal form in which half the minor axis (or the inside depth of the head not including the flange) is at least equal to one-fourth of the inside diameter of the head flange, shall be made at least as thick as the required thickness of the seamless shell of the same diameter, as specified in § 52.05–10.

(b) The radius to which a head is dished shall be not greater than the outside diameter of the flanged portion of the head. Where two radii are used, the longer shall be taken as the value of R in formulas (1) and (2) of this section.

(c) The maximum allowable pressure and minimum thickness of dished cast steel or bronze heads, where permitted, shall be calculated by the appropriate formulas in this section.

(d) The maximum allowable pressure and minimum thickness of cast-iron dished heads, where permitted, shall be calculated by the appropriate formulas in Part 54 of this subchapter for unfired pressure vessels.

§ 52.20–15 Detail requirements.

(a) Where the radius R to which a dished head is formed is less than 80 percent of the inside diameter of the shell, the thickness of a head with a flanged-in manhole opening shall be not less than the value found by making R, in Formulas (1) and (2) in § 52.20–10, equal to 80 percent of the inside diameter of the shell and with the added thickness for the manhole. The thickness calculated shall be the minimum thickness of a head with a flanged-in manhole opening for any form of head and the maximum allowable stress shall not exceed 80 percent of the values given in Table 52.05–10 (a) or 54.03–10 (c) in Part 54 of this subchapter.

(b) When dished heads are of a thickness less than called for by § 52.20–10 they shall be stayed as flat surfaces. Allowance may be made for the holding power of the spherical form provided the following conditions are met:

(1) The heads are at least two-thirds of the thickness required for unstayed dished heads;

(2) The heads are at least ⅞ inch in thickness;

(3) Through stays are used and attached to the dished head by outside and inside nuts; and,

(4) The maximum allowable pressure shall not exceed that calculated by the regulations for an unstayed dished head plus the pressure corresponding to the strength of the stays or braces obtained by Subpart 52.30, using 170 for the value of C.

(c) If a dished head concave to the pressure is formed with a flattened spot or surface, the diameter of the flat spot shall not exceed that allowed for flat heads as given by formulas (1) and (2) of § 52.22–10, and the minimum thickness shall be computed by these formulas, using $C=0.25$.

(d) When a spherically dished head has a flanged-in manhole or other access opening exceeding 6 inches in any dimension, the thickness of the head shall be increased by not less than 15 percent of the required thickness for a blank head computed by formula (2) of § 52.20–10, but in no case by less than ⅛ inch additional thickness over a blank head.

(e) If a flanged-in manhole which meets the requirements of § 52.20–20 is placed in a full-hemispherical head or ellipsoidal head, the thickness of the head shall be the same as for a head dished to a segment of a sphere, with the radius of dish equal to eight-tenths of the inside diameter of the shell and with the added thickness for the manhole as specified in paragraph (d) of this section.

(f) (1) Except as provided for in paragraphs (d) and (e) of this section, all openings which require reinforcement placed in an unstayed spherically dished head, or an ellipsoidal head, or in a full-hemispherical head, including all types of manholes except those of the integral flanged-in type, shall be reinforced in accordance with § 52.25–20.

(2) When so reinforced, the thickness of such a head may be the same as for a blank unstayed dished head.

(g) Where a spherically dished head has a flanged opening supported by an attached flue, an increase in the thickness over that computed by formula (2) of § 52.20–10 is not required.

(h) If more than one flanged-in manhole or access opening is inserted in a dished head, the thickness of which is calculated by paragraph (d) of this section, the minimum distance between the openings shall be not less than one-fourth of the outside diameter of the head.

(i) (1) The maximum allowable pressure and the minimum thickness of an unstayed dished head of any form excluding hemispherical heads, without manhole or handholes with the pressure on the convex side shall be calculated by Formulas (1) and (2) of § 52.20–10, but only 60 percent of the maximum allowable pressure thus determined shall be allowed.

(2) The maximum allowable pressure and minimum thickness of an unstayed hemispherical head without manhole or handholes with the pressure on the convex side shall be calculated by Formulas (3) and (4) of § 52.20–10, but only 60 percent of the maximum allowable pressure thus determined shall be allowed.

(j) No head, except a full-hemispherical head, shall be of a lesser thickness than that required for a seamless shell of the same diameter.

(k) When the flange of an unstayed dished head is machined to make a close fit into or onto the shell, the thickness shall be not reduced to less than 90 percent of that required for a blank head.

§ 52.20–20 Openings in dished heads.

(a) Flanged-in manhole openings in a dished head shall be flanged to a minimum radius measured on the inside of the plate of not less than ⅞ inch for plates up to and including 1⅛ inches in thickness, and for plates exceeding 1⅛ inches in thickness, the radius shall be increased proportionately. The minimum depth of the flange measured from the outside of the opening along the major axis shall be not less than three times the required thickness of the head, or the required thickness of the head plus three inches, whichever is less.

(b) A manhole opening may be reinforced by a riveted manhole frame or other attachment in lieu of flanging.

(c) Unreinforced openings (or openings with inherent reinforcement) in dished heads shall be governed by the following:

(1) The edge of any unreinforced opening, excluding rivet holes, shall come no closer to the line bounding the spherical or ellipsoidal portion of the head around a manhole than the distance equal to the thickness of the head, and in no case, except for water-column connections, shall it come within the part formed by the corner radius of a dished head.

(2) The maximum allowable diameter of any unreinforced opening in a head, except in a full-hemispherical head, shall not exceed that permitted by § 52.25–15 (a) for a shell of the same outside diameter as the outside diameter of the flange of the head, of the same thickness, allowable pressure and material as that in the head, nor shall it exceed 8 inches in any case.

(3) For unreinforced openings in full-hemispherical heads, the requirements of subparagraph (2) of this paragraph shall apply, except that the value of K shall be one-half the value given by the formula in § 52.25–15 (a).

(4) The minimum distance between the centers of any two unreinforced

openings, rivet holes excepted, shall be determined by the following formula:

$$L=\frac{A+B}{2(1-K)} \quad (2)$$

where:

L = distance between the centers of the two openings, measured on the surface of the head, in inches.

A and B = diameters of the two openings in inches.

K = same as defined in § 52.25–15 (a) for the equivalent shell described in subparagraph (2) of this paragraph.

Subpart 52.22—Flat Heads

§ 52.22–1 Definitions.

(a) *Unstayed heads.* Unstayed heads are the ends of a pressure vessel. They may be either flat or dished. Heads may be integral with, riveted, or welded to the shell. Unstayed flat heads may be used to close shells as permitted by § 52.22–10.

(b) *Stayed heads.* Stayed heads are heads supported in whole or in part by stays, furnaces, flues, tubes, etc.

§ 52.22–5 Materials and workmanship.

(a) Steel plate used in the fabrication of flat heads shall conform to the specifications and requirements for the shell plates, except that small end closures in headers may be made of material complying with subpart 51.22 of this subchapter.

(b) The heads here considered are of steel plate. Cast steel, cast iron or bronze heads may be used for pressure vessels other than boilers, but only where specifically authorized by the Commandant.

§ 52.22–10 Computations.

(a) The maximum allowable pressure and minimum required thickness of unstayed flat heads, cover plates, blind flanges, etc., shall be determined by the following formulas:

$$P=\frac{ST^2}{CD^2} \quad (1)$$

$$T=D\sqrt{\frac{CP}{S}} \quad (2)$$

where:

D = diameter, or shortest span, measured as indicated in figure 52.22–10, in inches.

P = maximum allowable pressure, in pounds per square inch.

T = minimum required thickness of plate, in inches.

S = maximum allowable stress, in pounds per square inch, taken from tables 52.05–10 (a) and 54.03–10 (c) and subject to the limitations of § 52.05–12.

C = 0.162 for plates rigidly riveted or bolted to shells, flanges, or side plates as shown in figure 52.22–10 (A); and for integral flat heads as shown in figure 52.22–10 (B) where dimension D does not exceed 24 inches and the ratio of thickness of the head to dimension D is at least equal to or greater than 0.05.

C = 0.25 for heads forged integral with or butt-welded to shells, pipes, or headers as shown in figures 52.22–10 (C) and (D), where the corner radius on the inside is not less than three times the thickness of the flange immediately adjacent thereto, and where the welding meets all the requirements for circumferential joints given in Part 56, including stress relieving and radiographic examination.

C = 0.50 for plates arc- or gas-welded to the inside of pressure vessels, pipes or headers and otherwise meeting the requirements for respective type of arc- or gas-welded vessels, including stress relieving but omitting radiographic examination. The plate shall be welded as shown in figure 52.22–10 (E), with a weld having a depth equal to two times the required thickness of a seamless shell, but not greater than the head thickness nor in any case less than 1.25 times the actual shell thickness, and where the weld is deposited in a welding groove with the root of the weld at the inner face of the head. The remainder of the head plate may be beveled to an angle not exceeding 45°.

$C=0.30+1.40\frac{Wh_g}{HD}$ for plates bolted to shells, flanges, or side plates, in such a manner that the setting of the bolts tends to dish the plate, and where the pressure is on the same side of the plate as the bolting flange, as shown in figures 52.22–10 (F) and (G), where:

W = flange design bolt load, in pounds.

h_g = radial distance from the bolt-circle diameter to the diameter D, in inches.

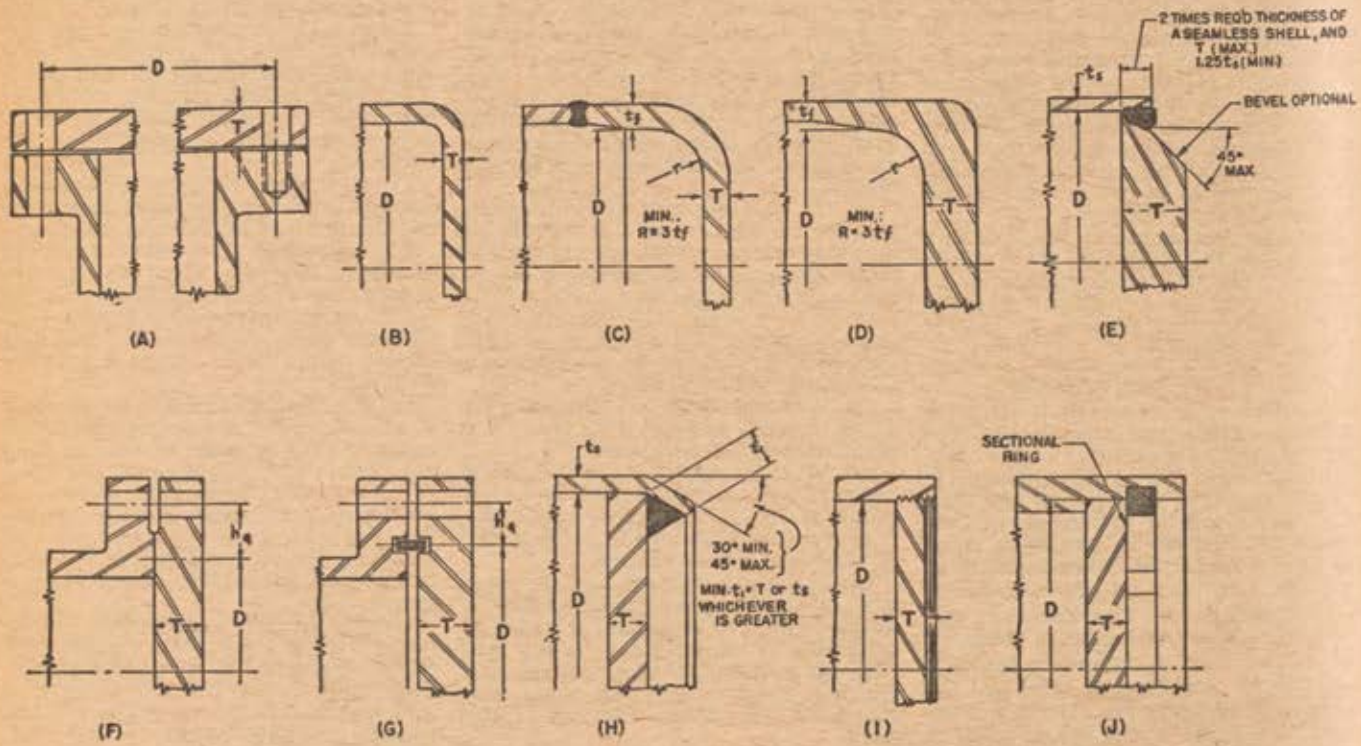


FIGURE 52.22–10—Acceptable types of flat heads.

H = total hydrostatic end force on area bounded by the mean diameter of the gasket or joint contact surface, in pounds.

D = diameter, or shortest span, measured as indicated in figure 52.22-10, in inches.

C = 0.50 for plates having a dimension D not exceeding 18 inches inserted into pressure vessels and welded thereto as shown in figure 52.22-10 (H), and otherwise meeting the requirements for the respective type of class II welded pressure vessel including stress relieving but omitting radiographic examination. The end of the pressure vessel shall be crimped over to an angle not less than 30° nor more than 45°. The throat of the weld shall be not less than the thickness of the shell or head, whichever is the greater.

C = 0.75 for plates screwed into the end of a pressure vessel having an inside diameter D not exceeding 12 inches, as shown on figure 52.22-10 (I), or for heads having an integral flange screwed over the end of a pressure vessel having an inside diameter D not exceeding 12 inches. The design of the threaded joint against failure by shear, tension, or compression resulting from the end force due to pressure shall be based on a factor of safety of at least 4 and the threaded parts are at least as strong as the threads for standard piping of the same diameter, and the head shall be welded to the pressure vessel by means of a seal weld.

C = 0.30 for plates inserted into the ends of pressure vessels and held in place as shown in figure 52.22-10 (J) where all possible means of failure, either by shear, tension, or compression, due to the hydrostatic end force, are resisted with a factor of safety of 4. Seal welding may be used, if desired.

§ 52.22–15 Openings in flat heads.

The reinforcement of openings in flat heads shall comply with the requirements of § 52.25–25.

Subpart 52.24—Access and Inspection Openings

§ 52.24–1 Definitions.

(a) *Openings.* Access or inspection openings, as defined in this subpart, are holes cut in the shells or heads of boilers or other pressure vessels for the purpose of inspection and cleaning.

NOTE: Openings in the shells or heads of boilers or other pressure vessels, including domes and steam chimneys, for other purposes than above defined (such as pipe connections and mountings) are covered in Subpart 52.25.

(b) *Manhole.* A manhole is an access opening in a boiler or unfired pressure vessel of sufficient size to permit an inspector to enter the vessel. Manholes may be of elliptical or circular shape.

(c) *Handhole.* A handhole is an opening in a pressure part of a boiler or unfired pressure vessel for the purpose of access or inspection, usually not exceeding 6 inches in longest dimension. The shapes of handholes may be circular, elliptical, or rectangular with rounded corners.

§ 52.24–5 Materials and workmanship.

(a) The cover plates for manholes shall be of rolled or forged steel conforming to the requirements of Subpart 51.04 or 51.46 of this subchapter. Handhole covers may be made of rolled, forged or cast steel conforming to the requirements of Subpart 51.04, 51.22, 51.46 or 51.58 of this subchapter.

(b) Manhole covers shall be marked with the manufacturer's name or trademark together with the maximum allowable pressure.

(c) Manhole and handhole yokes or dogs shall be of forged steel, pressed steel, or cast steel conforming to the requirements of Subpart 51.04, 51.22, 51.46 or 51.58 of this subchapter. The material of bolts securing yokes or dogs and cover plates shall conform to the requirements of Subpart 51.07 of this subchapter.

(d) When handhole or other access openings are made, a margin of not less than ¼ inch shall be left when punching operations are used, and not less than ⅛ inch shall be left when machine burning methods are employed. Such margins shall be machined or ground away to relieve the metal of any stresses which may be set up due to burning or punching operations.

(e) The minimum width of bearing surface for a gasket on a manhole opening shall be $1\frac{1}{16}$ inch. No gasket for use on a manhole or handhole of any boiler shall have a thickness greater than ¼ inch, when compressed.

§ 52.24–10 Detail requirements.

(a) All boilers or pressure parts thereof shall be provided with suitable manhole, handhole, or other inspection openings for examination and cleaning.

(b) Manhole openings shall be of elliptical form, the dimensions of which shall be not less than 10 by 16 inches or 11 by 15 inches. The size 12 by 16 inches should be used wherever practicable. Circular manholes having diameters of not less than 15 inches may be permitted.

(c) A handhole opening in a boiler shell or header shall be not less than 4 inches in any direction. This requirement does not apply to small access openings such as used in superheater headers.

(d) Inspection openings smaller than specified for handholes are permissible where a handhole is impracticable.

(e) Where elliptical openings are made in the shell of a boiler or other pressure vessel, the minor axis shall, as far as practicable, be placed longitudinally.

(f) All manholes, handholes, and inspection openings shall be closed by readily removable internal cover plates which shall be held by one or more girders or dogs and bolts. The cover plates shall be formed with a projection to fit within the opening with a radial clearance not exceeding $\frac{1}{16}$ inch at any point. This projection may be in form of a raised face which shall protrude straight out from the joint face within the opening not less than ½ inch on manholes or ⅜ inch on smaller cover plates.

(g) When a threaded opening is to be used for inspection or washout purposes, it shall be not less than 1 inch pipe size. The closing plug or cap shall be of nonferrous material, except for pressures over 250 p. s. i. or temperatures over 406° F.

(h) A manhole shall be located in the front head below the tubes of a horizontal-return tubular boiler 48 inches or over in diameter. Smaller boilers shall have either a manhole or a handhole below the tubes. There shall be a manhole in the upper part of the shell or head of a fire-tube boiler over 40 inches in diameter, except on a vertical fire-tube boiler, or except on internally fired boilers not over 48 inches in diameter. Smaller boilers shall have either a manhole or a handhole above the tubes.

(i) [Reserved]

(j) A vertical fire-tube boiler shall have not less than four handhole openings in the shell located as follows:

(1) One at or about the waterline or opposite the fusible plug.

(2) Three at or about the line of the crown sheet or lower tube sheet, and if internally fired, not less than three additional handholes at the lower part of the waterleg.

(k) If a vertical fire-tube boiler is equipped with manholes or other access openings through which adequate inspection may be made, the required handholes and/or inspection openings at the waterline and for the tube sheets may be omitted.

(l) All manholes, handholes, inspection and washout openings in a shell or head shall be designed in conformance with the requirements of Subpart 52.25 of this subchapter.

Subpart 52.25—Openings and Reinforcements [1]

§ 52.25–1 Scope.

(a) The regulations in this subpart apply to all openings in shells, headers or heads except as otherwise provided in paragraphs (b) and (c) of this section.

(b) Openings in a definite pattern, such as tube holes, may be designed in accordance with the requirements for ligaments in Subpart 52.40, provided the diameter of the largest hole in the group does not exceed that permitted by § 52.25–15.

(c) Calculations demonstrating compliance with the requirements of this subpart shall be made for all openings except:

(1) For single openings not greater than 2-inch pipe size in shells or headers

[1] The regulations governing openings as given in this subpart are based on the stress intensification created by the existence of a hole in an otherwise symmetrical section. The requirements are based on experience with vessels designed with safety factors of 4 and 5 applied to the ultimate strength of the shell material. External loadings such as those due to the movement of the ship, thermal expansion, or unsupported weight of connecting piping have not been evaluated and should be given consideration in unusual designs or under conditions of cyclic loading.

having an inside diameter not less than four times the diameter of the opening; and

(2) For tube holes arranged in a definite pattern as provided in paragraph (b) of this section.

(d) The requirements for reinforcement of openings are intended to apply to openings not exceeding the following dimensions: [3]

(1) For shells 60 inches in outside diameter or less, one-half the shell diameter but not over 20 inches.

(2) For shells over 60 inches in outside diameter, one-third the shell diameter, but not over 40 inches.

(e) Openings, as defined in this subpart, are holes cut in shells or heads of boilers or pressure vessels, including domes and steam chimneys, for the purpose of inspection and cleaning, and for the purpose of connecting nozzles or mountings to shells or heads of such boilers or pressure vessels.

(f) Manhole or other openings in a flat, stayed surface shall be deemed to be sufficiently reinforced if the plate is flanged inwards to a depth not less than that determined by § 52.20–20(a).

§ 52.25–5 Materials and workmanship.

(a) The material for reinforcing plates around openings shall conform to the requirements of the plate to be reinforced, except as otherwise provided in § 52.25–35. When they are locally heated for flanging or forming, they shall be properly annealed.

(b) A forged nozzle or forged flange, riveted or welded to the plate, may be considered as reinforcement, provided such fittings are properly designed to compensate for the material removed.

(c) Rivets used in securing reinforcing plates to the shell or other structural part shall conform to the requirements of Subpart 51.07 or 51.13 of Part 51 of this chapter.

(d) The inner radius of the bend of any flanged opening in heads, except manholes or other access openings as specified in § 52.20–20, shall be: for furnace attachments, not less than twice the thickness of the plate flanged; for flue attachments in externally fired boilers, not less than one and one-half times the thickness of the plate flanged.

(e) The riveted joint of a reinforcing plate fitted to an opening in the shell or other part of a boiler or other pressure vessel, shall be properly calked along the edge of the opening and the outer edge of the reinforcing plate as specified in Subpart 52.10 for riveted joints.

§ 52.25–10 Unreinforced openings.

Plain unreinforced openings in a definite pattern such as tube holes or openings with integral reinforcement shall not exceed the diameter determined by § 52.25–15, nor shall they exceed a diameter of 8 inches in any case.

§ 52.25–15 Computations.

(a) (1) The maximum diameter of an unreinforced opening as defined in § 52.25–10 shall be determined by the following formulas:

$$d = 2.75\sqrt{DT(1-K)} \quad (1)$$

$$K = \frac{PD}{1.82ST} \quad (2)$$

$$K = \frac{PD}{1.6ST} \quad (3)$$

where:

d = maximum allowable diameter of unreinforced openings, in inches.

T = actual full thickness of shell plate, in inches (including the 0.10 inch additional thickness).

D = outside diameter of the drum or shell, in inches.

S = maximum allowable stress as given in table 52.05–10 (a) or 54.03–10 (c) in pounds per square inch.

K = ratio of the computed stress in the solid plate to the maximum allowable stress.

P = maximum allowable pressure, in pounds per square inch.

(2) In determining the maximum size of an unreinforced opening in a shell, head, or header designed under the provisions of § 52.05–12(a), the value of K shall be computed by formula (2).

(3) In determining the maximum size of an unreinforced opening in a shell, or header designed under the provisions of § 52.05–12(c) in which the value of S is taken as not more than 80 percent of that given in Tables 52.05–10(a) and 54.03–10(c) in Part 54 of this subchapter, the value of K shall be computed by formula (3).

(b) The maximum diameter of unreinforced openings may be determined by use of diagrams, Figures 52.25–15 (b1) and 52.25–15 (b2).

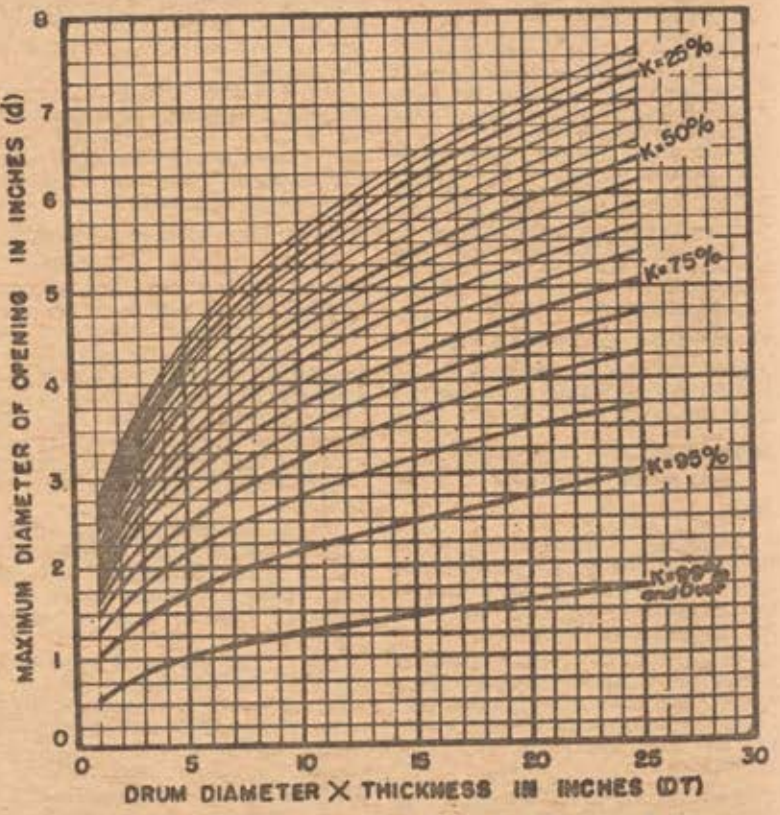


FIGURE 52.25–15 (b1)—Maximum diameter of openings with inherent reinforcement in cylindrical shells.

[3] For larger openings it is recommended that the reinforcement to be provided be distributed close to the opening and be at least equal to two-thirds of the required reinforcement within a distance of ¼ d on each side of the finished opening.

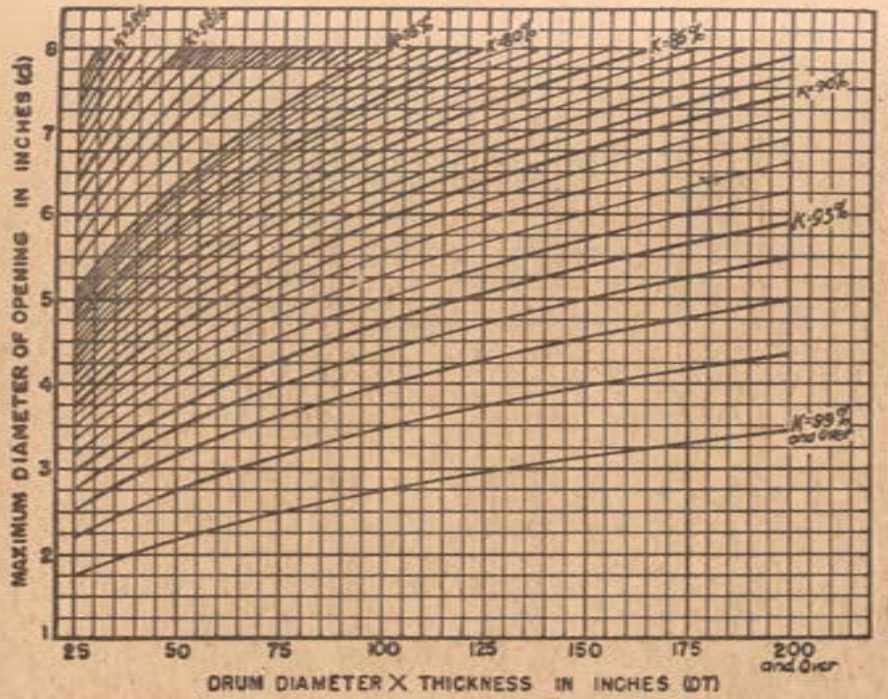


FIGURE 52.25-15 (b2)—Maximum diameter of openings with inherent reinforcement in cylindrical shells.

§ 52.25-20 Reinforced opening in shells and dished heads.

(a) The regulations in this section shall apply to all openings other than flanged-in openings in dished heads covered by § 52.20-15, openings in flat heads covered by § 52.25-25, and openings covered by § 52.25-1 (b) and (c).

(b) Reinforcement shall be provided in amount and distribution such that the area requirements for reinforcement are satisfied for all planes through the center of the opening and normal to the vessel surface. For a circular opening in a cylindrical shell, the plane containing the axis of the shell is the plane of greatest loading due to pressure.

(c) The total cross-sectional area of reinforcement in any given plane shall be not less than that prescribed by the following formula:

$$A = d \times T_r \times F \qquad (1)$$

where:

A = the required area of reinforcement, in square inches.

d = the diameter in the given plane of the finished opening, in inches.

T_r = the required thickness of a seamless shell, header or blank head, in inches, except that: (1) For spherically dished heads when the opening and its reinforcement are entirely within the spherical portion, T_r is the thickness required for a seamless hemispherical head of the same radius as that of the spherical portion; (2) for ellipsoidal heads when the opening and its reinforcement are located entirely within a circle the center of which coincides with the center of the head and diameter of which is equal to 80 percent of the shell inside diameter, T_r is the thickness required for a seamless hemispherical head of radius equal to 90 percent of the inside diameter of the shell.

F = 1.00 when the plane under consideration is on the longitudinal axis of a shell and for heads. For other planes in a shell or header the value of F shall be determined from figure 52.25-20(c).

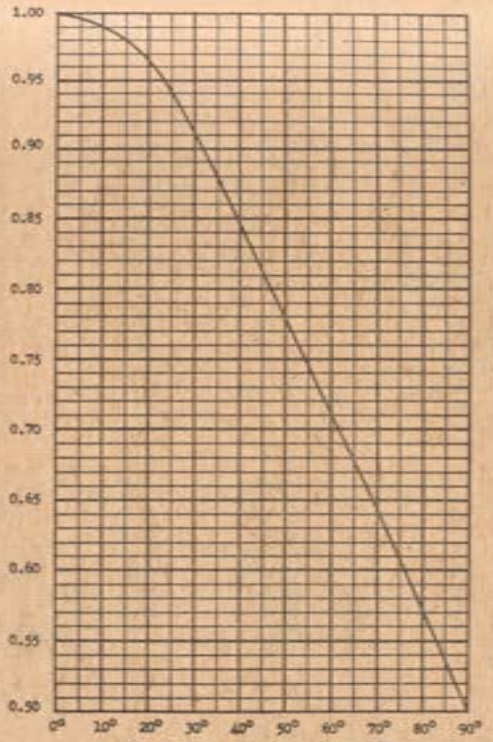


FIGURE 52.25-20 (c)—Chart for determining values of F.

§ 52.25-25 Reinforced openings in flat heads.

(a) Flat heads that have an opening with a diameter that does not exceed one-half of the head diameter or shortest span, as defined in § 52.22-10, shall have a total cross-sectional area of reinforcement not less than that given by Formula (1).

$$A = 0.5d \times T \qquad (1)$$

where:

A = the required area of reinforcement, in square inches.

d = diameter in the given plane of the finished opening, in inches.

T = minimum required thickness of plate, in inches, as determined from § 52.22-10.

(b) As an alternate to paragraph (a) of this section, the thickness of flat heads may be increased to provide the necessary reinforcement by using 2C in the place of C in the formulas for calculating head thickness in § 52.22-10. The value of $2C$ to be used in the formula need not exceed 0.75, except for the types of flat heads indicated by figures 52.22-10 (F) and (G).

(c) Flat heads that have an opening with a diameter that exceeds one-half of the head diameter, or shortest span, as defined in § 52.22-10, shall be designed as a flange.

§ 52.25-30 Reinforcement limits.

(a) The boundaries of the cross-sectional area in any plane normal to the vessel wall and passing through the center of the opening within which metal must be located in order to have value as reinforcement are designated as the limits of reinforcement for that plane.

(b) The limits of reinforcement, measured along the vessel wall, shall be

at a distance on each side of the axis of the opening equal to the greater of the following:

(1) The diameter of the finished opening.

(2) The radius of the finished opening plus the thickness of the vessel wall, plus the thickness of the nozzle wall.

(c) The limits of reinforcement, measured normal to the vessel wall, shall conform to the contour of the surface at a distance from each surface equal to the smaller of the following:

(1) Two and one-half times the shell thickness.

(2) Two and one-half times the nozzle wall thickness, plus the thickness of any added reinforcement exclusive of the weld metal on the side of the shell under consideration.

(d) (1) The metal thickness in the shell and nozzle wall in excess of the thickness required to resist pressure may be considered as reinforcement within the reinforcement limits given in this section.

(2) The area in the shell available as reinforcement shall be the larger of the values as given in the following formulas:

$$A_1 = (ET - FT_r)d \quad (1)$$

or,

$$A_1 = 2(ET - FT_r)(T + T_n) \quad (2)$$

where:

A_1 = area in the excess thickness in shell or head available for reinforcement, in square inches.

E = 1, when the opening is in the solid plate or when the opening passes through a circumferential joint in a shell (exclusive of head-to-shell joints); or the longitudinal joint efficiency when any part of the opening passes through any other welded joint.

T = Actual thickness of the shell or head, in inches.

T_r = Required thickness of the shell or head to resist pressure, as defined in § 52.25–20, in inches.

T_n = Actual thickness of the nozzle wall, in inches.

d = diameter in the plane under consideration of the finished opening, in inches.

F = factor from figure 52.25–20 (c).

(3) The metal thickness of the nozzle used for determining the area in the nozzle available as reinforcement shall be the difference between the actual thickness and the required minimum thickness to resist pressure. In this connection the required thickness of the nozzle may be determined by the same formula used in calculating the required thickness of the shell omitting, only in the case of boilers, the 0.1 inch additive thickness.

(4) Metal added as reinforcement and metal in attachment welds may be considered as reinforcement within the reinforcement limits.

(e) Figure 52.25–30 (e) illustrates limits of reinforcement for some typical openings.

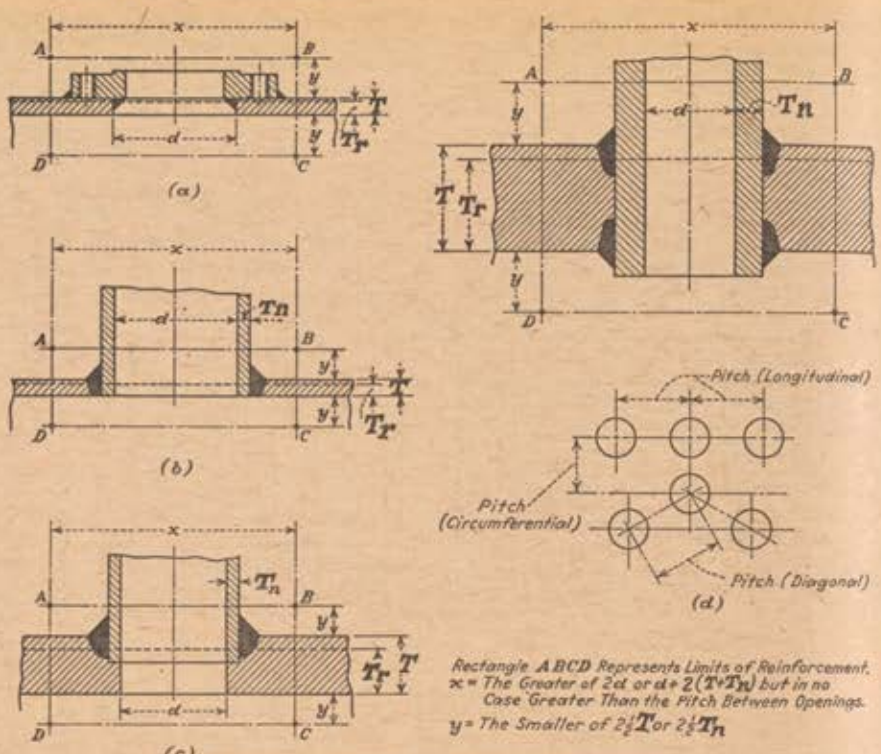


FIGURE 52.25–30 (e)—Limits of reinforcement.

§ 52.25–35 Strength of reinforcement.

(a) Material used for reinforcement shall have an allowable stress value equal to or greater than that of the material in the vessel wall, except that material of lower strength may be used provided the area of reinforcement is increased to compensate for the lower allowable stress value of the reinforcement. No credit may be taken for the additional strength of any reinforcement having a higher allowable stress value than that of the vessel wall. Where pressure vessels are designed under the provisions of § 52.05–12 (c), the allowable stress value shall be taken as equivalent to 0.8 times the values shown in tables 52.05–10 (a) and 54.03–10 (c) in Part 54 of this subchapter.

(b) On each side of the plane defined in § 52.25–30(a), the strength of the attachment joining the vessel wall and reinforcement or any two parts of the attached reinforcement, shall be at least equal to the smaller of:

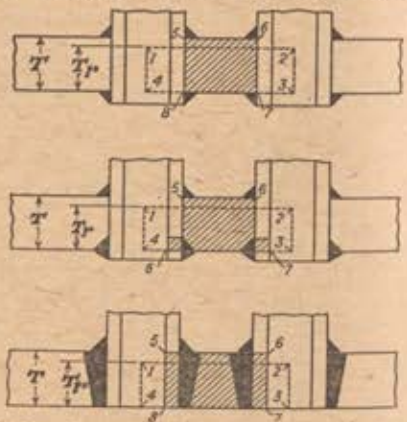
(1) The strength in tension of the cross section of the element of reinforcement being considered, or

(2) The strength in tension of the area of the unfinished opening, including any rivet or stud hole, in the shell or head based on T_r less the strength in tension of the reinforcing area which is integral in the vessel wall as permitted by § 52.25–30(d). The strength of the attachment shall be considered for its entire length on each side of the plane normal to the vessel wall.

§ 52.25–40 Reinforcement of multiple openings.

(a) Two adjacent openings shall have a distance between centers not less than 1⅓ times their average diameter.

(b) When any two or larger groups of adjacent openings which require



The Cross-Sectional Area Represented by 5, 6, 7, 8 Shall be at Least Equal to the Area of the Rectangle Represented by 1, 2, 3, 4 Multiplied by 0.7F, in which F is a value from fig. 52.25-20-(c) and Tr is the Required Thickness of a Seamless Shell.

FIGURE 52.25–40 (c)—Reinforcement of multiple openings.

reinforcement are so spaced that their limits of reinforcement overlap, the two or larger group of openings shall be reinforced in accordance with § 52.25–20 with a reinforcement that has an area equal to the combined area of the reinforcement required for the separate openings. No portion of the cross section shall be considered as applying to more than one opening or be evaluated more than once in a combined area.

(c) When a shell, drum or header has a series of holes in a definite pattern, the net cross-sectional area between any two finished openings within the limits of the actual shell wall, excluding the portion of reinforcing part not fused to the shell wall, shall equal at least 0.7 F of the cross-sectional area obtained by multiplying the center-to-center distance of the openings by the required thickness of a seamless shell, where the factor F is taken from figure 52.25–20 (c) for the plane under consideration. A typical illustration of the requirements prescribed in this paragraph is given in figure 52.25–40 (c).

§ 52.25–45 Welded connections.

(a) Sufficient welding shall be provided on either side of the plane through the center of the opening parallel to the longitudinal axis of the shell to develop the strength of the reinforcing parts through shear or tension in the weld, whichever is applicable. The strength of the groove welds shall be based on the area subjected to shear or to tension. The strength of fillet welds shall be based on the area subjected to shear (computed on the minimum leg dimension). The inside diameter of a fillet weld shall be used in figuring its length.

(b) The allowable stress values for groove and fillet welds and for shear in nozzle necks, in percentages of stress value for the vessel material, shall be in accordance with table 52.25–45(b).

TABLE 52.25–45 (b)—ALLOWABLE STRESS VALUES

	Stress-relieved	Not stress-relieved
	Percent	*Percent*
Nozzle-wall shear	70	70
Groove-weld tension	74	70
Groove-weld shear	60	56
Fillet-weld shear	49	46

(c) Reinforcing plates or saddles of nozzles attached to the outside of the vessel shall be provided with at least one telltale hole of ¼ inch maximum pipe tap size for testing tightness of welds that seal off the inside of the vessel. The telltale holes shall be left open when the vessel is in service.

(d) (1) The location and minimum size of attachment welds shall conform to the requirements shown in figure 52.25–45 (d), which illustrates some types of acceptable arc-welded connections.

(2) The symbols used in figure 52.25–45 (d) are defined as follows:

t = thickness of vessel shell or head, less corrosion allowance, in inches.
t_n = thickness of nozzle wall, less corrosion allowance, in inches.
t_e = thickness of reinforcing element, in inches.
t_w = dimension of partial-penetration attachment welds (fillet, single-bevel, or single-J) in inches.
t_c = the smaller of ¼ inch or 0.7 t_n. (Inside corner welds may be further limited by a lesser length of projection of the nozzle wall beyond the inside face of the vessel wall) in inches.
t_{min} = the smaller of ¾ inch or the thickness of either of the parts joined by a fillet, single-bevel or single-J weld, in inches.

(3) When nozzles or couplings are attached to boilers and unfired pressure vessels as shown in figure 52.25–45 (d), (a) and (c), and are welded from one side only, backing strips shall be used unless the inside of the joint can be visually inspected in order that the inspector may satisfy himself that complete penetration is obtained. When attachments as shown in figure 52.25–45 (d), (y) and (z), are employed they shall be limited to 2-inch pipe size for pressures exceeding 150 pounds per square inch.

(e) When the end faces of nozzles or manhole necks are to remain unwelded

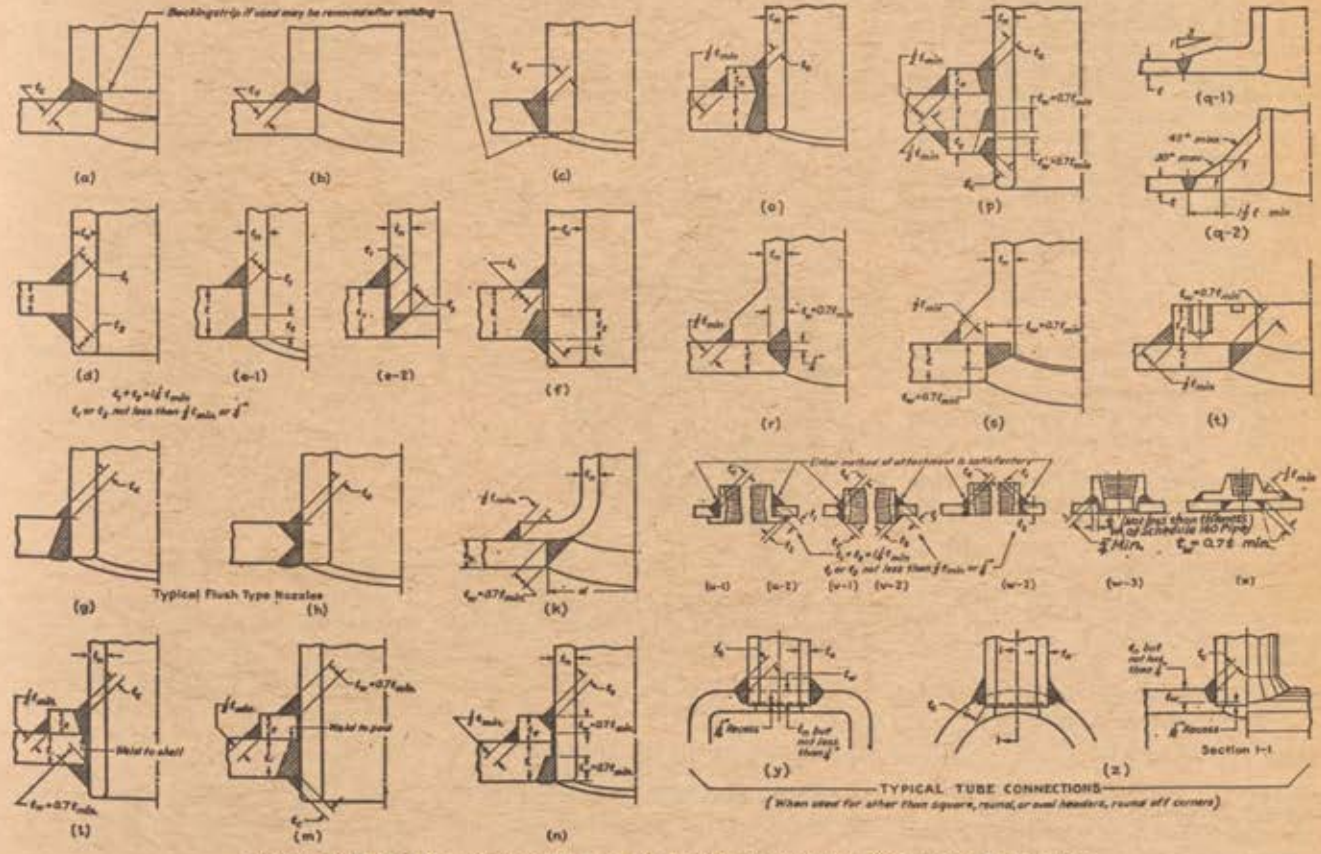


FIGURE 52.25–45 (d)—Acceptable types of welded connections to drums and headers.

in the completed vessel, these end faces shall not be cut by shearing unless at least ⅛ inch of the additional metal is removed by any method that will produce a smooth finish.

§ 52.25–50 Riveted connections.

(a) Openings for nozzles and other connections shall be far enough away from any main riveted joint so that the joint and the opening reinforcement plates do not interfere with one another.

(b) Welded connections which require stress-relieving and which are attached to vessels having seams of riveted construction shall be fabricated and stress-relieved prior to the making up or attachment of the courses by riveting. If they do not require stress-relieving and are attached after riveting, the welds shall be located at a distance from the riveted seam at least equal to the outside diameter of the attachment weld plus four times the thickness of the shell plate.

(c) For nozzle fittings having a bolting flange and an integral flange for riveting, the thickness of the flange attached to the pressure vessel shall not be less than the thickness of the neck of the fitting.

(d) The strength of rivets in tension in a flanged frame or ring riveted to the outside of a vessel shall be at least equal to that required to resist the load due to the maximum allowable working pressure with a factor of safety of 5 computed as follows:

(1) For outside calking the load shall be equal to the area bounded by the outside calking multiplied by the maximum allowable working pressure;

(2) For inside calking (and with no outside calking) the load shall be equal to the area bounded by the inside calking multiplied by the maximum allowable working pressure.

(e) The rivets attaching nozzles shall be so spaced as to avoid the possibility of the shell plate or the nozzle flange failing by tearing around through the rivet holes.

§ 52.25–55 Boiler nozzle neck thickness.

(a) The thickness of a boiler nozzle shall be not less than the thickness required for Schedule 80 pipe of the same diameter and in no case less than that determined by § 55.07–5 of this subchapter.

(b) The minimum thickness of a tube nipple when used in a reinforced opening on a boiler shall not be less than the required thickness of a boiler tube as determined by § 52.55–10 of this subchapter, but in no case less than the required minimum thickness of a tube nipple based on 600 p. s. i. internal pressure.

Subpart 52.30—Surfaces Required To Be Stayed or Reinforced

§ 52.30–1 Definitions.

Surfaces to be stayed or reinforced include the following:

(a) Flat plates, heads or areas thereof, such as segments of heads, wrapper sheets, furnace plates, side sheets, combustion chamber tops, etc., which are not self-supporting.

(b) Curved plates constituting the whole or parts of a cylinder subject to external pressure which are not entirely self-supporting.

CROSS REFERENCES: For unstayed flat heads, see Subpart 52.22. For flat tube sheets, see Subpart 52.45. For curved tube sheets, see Subpart 52.40.

§ 52.30–5 Areas to be stayed.

The area of a segment or other portion of a flanged head to be stayed shall be that enclosed by lines as follows:

(a) Where only plain tubes are used in the bounding rows, the line of area shall be at one-half the diameter of the tube in inches, plus 2 inches from the center of the row of tubes.

(b) Where stay tubes are used in the bounding rows, the line of area shall be at one-half the maximum allowable pitch of the stays required for the plate, measured from the center of the row to stay tubes.

(c) On the side of the segments bounded by the shell or furnaces, the lines of area shall be at a distance d from the shell, as shown by figure 52.30–5 (c) the distance d to be computed by the following formula:

$$d = \frac{5T}{\sqrt{P}} \qquad (1)$$

where:

d = distance from shell, furnaces or flues considered self-supporting, in inches.
T = Thickness of plate, in sixteenths of an inch.
P = maximum allowable pressure, in pounds per square inch.

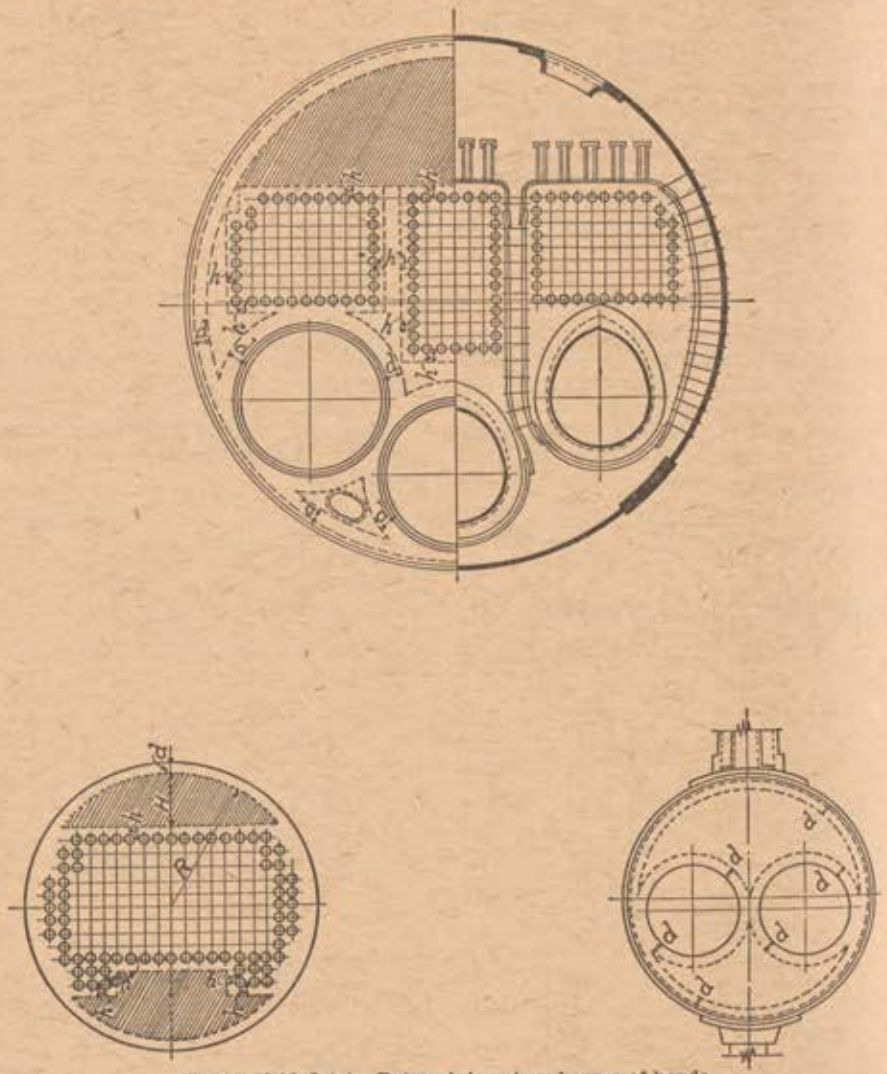


FIGURE 52.30–5 (c)—Determining stayed areas of heads.

(d) The value of h, as shown in figure 52.30–5 (c), shall be equal to one-half the diameter of the tube plus 2 inches where only plain tubes are used in the bounding row, or shall be equal to one-half the maximum allowable pitch of the stays required for the plate where stay tubes are used.

(e) Where the exact area of a circular segment of a flanged head cannot be readily ascertained by other accepted methods, the following formula may be

employed, using symbols indicated in Figure 52.30-5(c).

$$A=\frac{4H^2}{3}\sqrt{\frac{2R}{H}-0.6} \quad (2)$$

where:

A = area of segment which requires support, in square inches.
H = height of segment to self-supporting line, in inches.
R = radius of segment to self-supporting line, in inches.

(f) The area of a segment of an unflanged head to be stayed shall be the area enclosed by the shell and a line drawn 2 inches from the outside diameter of the tubes.

§ 52.30-10 Computations.

(a) The maximum allowable pressure and minimum thickness of plates supported by stays shall be determined by the following formulas:

(1) Surfaces without doubling plates:

$$P=\frac{CT^2}{p_1^2+p_2^2} \quad (1)$$

$$T=\sqrt{\frac{P(p_1^2+p_2^2)}{C}} \quad (2)$$

(2) Surfaces fitted with doubling plates:

$$P=\frac{C_1T_1^2}{p_1^2+p_2^2} \quad (3)$$

$$T_1=\sqrt{\frac{P(p_1^2+p_2^2)}{C_1}} \quad (4)$$

(3) Where doubling plates are used, the minimum allowable thickness shall be not less than 0.67 of the thickness of the plate reinforced and the maximum thickness shall not exceed 0.75 of the thickness of the plate reinforced.

(4) The maximum allowable pitch for stays in either direction shall be computed by the following formulas:

(i) Where stays are equally spaced in both directions:

$$p_1 \text{ or } p_2=\sqrt{\frac{CT^2}{2P}} \quad (5)$$

(ii) Where the pitch in one direction is greater than that in the other direction:

$$p_2=2\sqrt{\frac{CT^2}{5P}} \quad (6)$$

(iii) With the greater pitch thus determined for one direction, the maximum pitch in the other direction shall be computed by the formula:

$$p_1=\sqrt{\frac{CT^2}{P}-p_2^2} \quad (7)$$

(5) In no case shall p_2 be less than one-half p_1.

where:

P = maximum allowable pressure, in pounds per square inch.
T = thickness of plate, in sixteenths of an inch.
T_1 = combined thickness of plate and doubler or washer, in sixteenths of an inch.
p_1 = pitch of stays in one direction, in inches.
p_2 = pitch of stays in the other direction, in inches.
C and C_1 = coefficients based upon a minimum tensile strength of the plate, not less than 55,000 pounds per square inch, the kind of service to which subjected, and the method of construction, as follows:

Plates exposed to products of combustion:
C = 238 for plates under 7/16 inch in thickness, fitted with screw stays with nuts or welded collars, or stays attached to plates by welding.
C = 170 for plates 7/16 inch and over in thickness, fitted with screw stays with riveted heads.
C = 250 for plates 7/16 inch and over in thickness, fitted with screw stays with nuts or welded collars, or stays attached to plates by welding.
C = 190 for all plates fitted with stays secured by rivets.
C = 275 for plates fitted with stay tubes screwed and expanded in nests of tubes.
C = 320 for plates fitted with stay tubes screwed, expanded, and beaded in nests of tubes.
C = 185 for plates fitted with stay tubes screwed and expanded in bounding rows.
C = 225 for plates fitted with stay tubes screwed, expanded, and beaded in bounding rows.

Plates not exposed to products of combustion:
C = 274 for plates under 7/16 inch in thickness, fitted with screw stays with nuts or welded collars, or stays attached to plates by welding.
C = 190 for plates 7/16 inch and over in thickness, fitted with screw stays with riveted heads.
C = 290 for plates 7/16 inch and over in thickness, fitted with screw stays with nuts or welded collars, or stays attached to plates by welding.
C = 212 for all plates fitted with stays secured by rivets.
C = 340 for plates fitted with through stays with nuts on both inside and outside of plate.
C_1 = 175 for plates fitted with through stays with nuts inside and outside and having doubling plates covering the entire supported area.
C_1 = 145 for plates fitted with through stays, with nuts inside and outside and reinforced by washers efficiently riveted to the outside of the plate, the diameter of the washers to be not less than two-thirds the pitch of the stays.
C_1 = 155 for plates fitted with through stays, with inside and outside nuts and reinforced by doubling strips through which the stays are inserted, the width of the doubling strip to be not less than two-thirds of the pitch of the stays.
C_1 = 136 for plates fitted with screw stays and doubling strips between the rows of stays, the width of the doubling strip to be not less than two-thirds of the pitch of the stays.

(6) When a surface is supported by various types of stays for which different coefficients are provided, the average of the two coefficients for adjacent stays shall be used as the value of C or C_1 in the formulas.

(7) Riveted heads are not permissible on stays which are screwed into plates having a thickness of less than 7/16 inch. Such stays shall be fitted with nuts or welded collars.

(8) No plate less than 5/16 inch in thickness shall be used in stayed surface construction.

(b) Where two sheets are connected by stays and only one of them requires staying, the value of C or C_1 is governed by the thickness of the sheet to be stayed and the types of stays used.

(c) In determining the maximum distance between the center of a bounding line of tubes and the centers of adjacent stays, the value of C or C_1 given for the thickness of plate and type of stay or stay tube shall be used.

(d) In determining the maximum distance between a flanged edge and the centers of stays, the pitch which applies to the thickness of the plate and the type of stay may be increased up to 25 percent: *Provided*, That the increment shall not exceed the distance d determined by formula (1) in § 52.30-5.

(e) Where stayed plates are riveted to a flange, the distance from the center of the outermost stays to the center line of the rivets shall not exceed the pitch of the stays: *Provided*, That, where staybolts are adjacent to reinforced edges, such as around furnace doors, bottoms of fire boxes, etc., the maximum allowable pitch may be increased by the diameter of the staybolt hole.

(f) Where stays are fitted at the upper corners of fireboxes or combustion chambers, the distance d from the staybolt nearest the corner to the point of tangency of the corner curve, as shown by figure 52.30-10 (f), shall be determined by the following formula:

$$d=\frac{90T}{D}\sqrt{\frac{C}{2P}} \quad (8)$$

where:

C = applicable coefficient, as provided in paragraph (a).
d = distance from center of staybolt nearest the corner to the point of tangency of the curve.
T = thickness of plate, in sixteenths of an inch.
P = maximum allowable pressure, in pounds per square inch.
D = angle of tangents, in degrees.

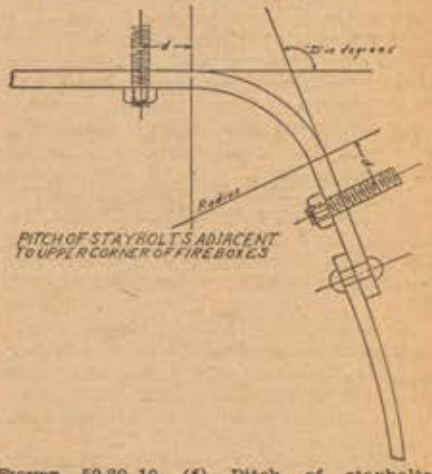


FIGURE 52.30-10 (f)—Pitch of staybolts adjacent to upper corners of fireboxes.

(g) (1) Curved surfaces subject to external pressure and not entirely self-supporting, shall be stayed in accordance with the requirements of this subpart and Subpart 52.35.

(2) Due allowance may be made for the strength inherent in the cylindrical form, except in the case of combustion chamber sheets, by providing that the maximum allowable pressure on a stayed

curved surface shall be the sum of the full pressure computed from formula (1) in this section for stayed plates, plus one-half of the pressure determined by formula (3) for curved plates in § 52.50–10 (b); or the full pressure allowable on the curved plate plus one-half of that allowed on the stayed surface, whichever gives the lower value.

Subpart 52.35—Stays and Reinforcements

§ 52.35–1 Definitions.

(a) *Through stay.* Through stay is a solid bar extended through both heads of a boiler and threaded at the ends for attachment by means of nuts. With this type of stay the ends are usually upset to compensate for the threading. (See figure 52.35–1(a).)

(b) *Solid screw staybolt.* Solid screw staybolt is a threaded bar screwed through the plates, the ends being riveted over or fitted with nuts or welded collars. (See figures 52.35–1 (b) and 52.35–1 (l).)

(c) *Hollow screw staybolt.* Hollow screw staybolt is a hollow threaded bar screwed through the plate, the ends being riveted over or fitted with nuts or welded collars. (See figure 52.35–1 (c).)

(d) *Flexible staybolt.* Flexible staybolt is a bar made with ball-and-socket joint on one end, the cup of the socket being screwed into the outside sheet and covered with a removable cap, the plain end of the staybolt being threaded, screwed through the inside sheet and riveted over. (See figure 52.35–1 (d).)

(e) *Sling stay.* Sling stay is a flexible stay consisting of a solid bar having one or both ends forged for a pin connection to a crowfoot or other structural fitting secured to the stayed plate. (See figure 52.35–1 (e).)

(f) *Crowfoot.* Crowfoot is a forged fitting with palms or lugs secured to the head to form a proper connection with a sling stay. (See figure 52.35–1 (f).)

(g) *Crowfoot stay.* Crowfoot stay is a solid bar stay terminating in a forged fork with palms or lugs for attachment to the plate. (See figure 52.35–1 (g).)

(h) *Diagonal stay.* Diagonal stay is a bar or formed plate forged with palms or lugs for staying the head of the boiler to the shell diagonally. (See figure 52.35–1 (h).)

(i) *Gusset stay.* Gusset stay is a triangular plate used for the same purpose as a diagonal stay and attached to the head and the shell by angles, flanges, or other suitable means of attachment. (See figure 52.35–1 (i).)

(j) *Dog stay.* Dog stay is a staybolt, one end of which extends through a girder, dog, or bridge, and is secured by a nut, the other end being screwed through the plate which it is supporting and riveted over or fitted with a nut or welded collar. (See figure 52.35–1 (j).)

(k) *Girder.* Girder is a bridge, built up of plates or structural shapes separated by distance pieces, a forging, or a formed plate, which spans an area requiring support, abutting thereon and supporting the girder stays or staybolts. (See figure 52.35–1 (k).)

(l) *Welded collar.* Welded collar is a beveled ring formed around the end of a screw stay by means of arc or gas welding. It is used in lieu of a nut. (See figure 52.35–1 (l).)

(m) *Reinforcement.* Reinforcement is a doubling plate, washer, structural shape, or other form for stiffening or strengthening a plate.

(n) *Stay tube.* Stay tube is a thick-walled tube used in fire-tube boilers to stay the tube sheets.

(o) *Telltale hole.* Telltale hole is a small hole having a diameter not less than 3/16 inch drilled in the center of a solid stay and extending to at least 1/2 inch beyond the inside surface of the sheet.

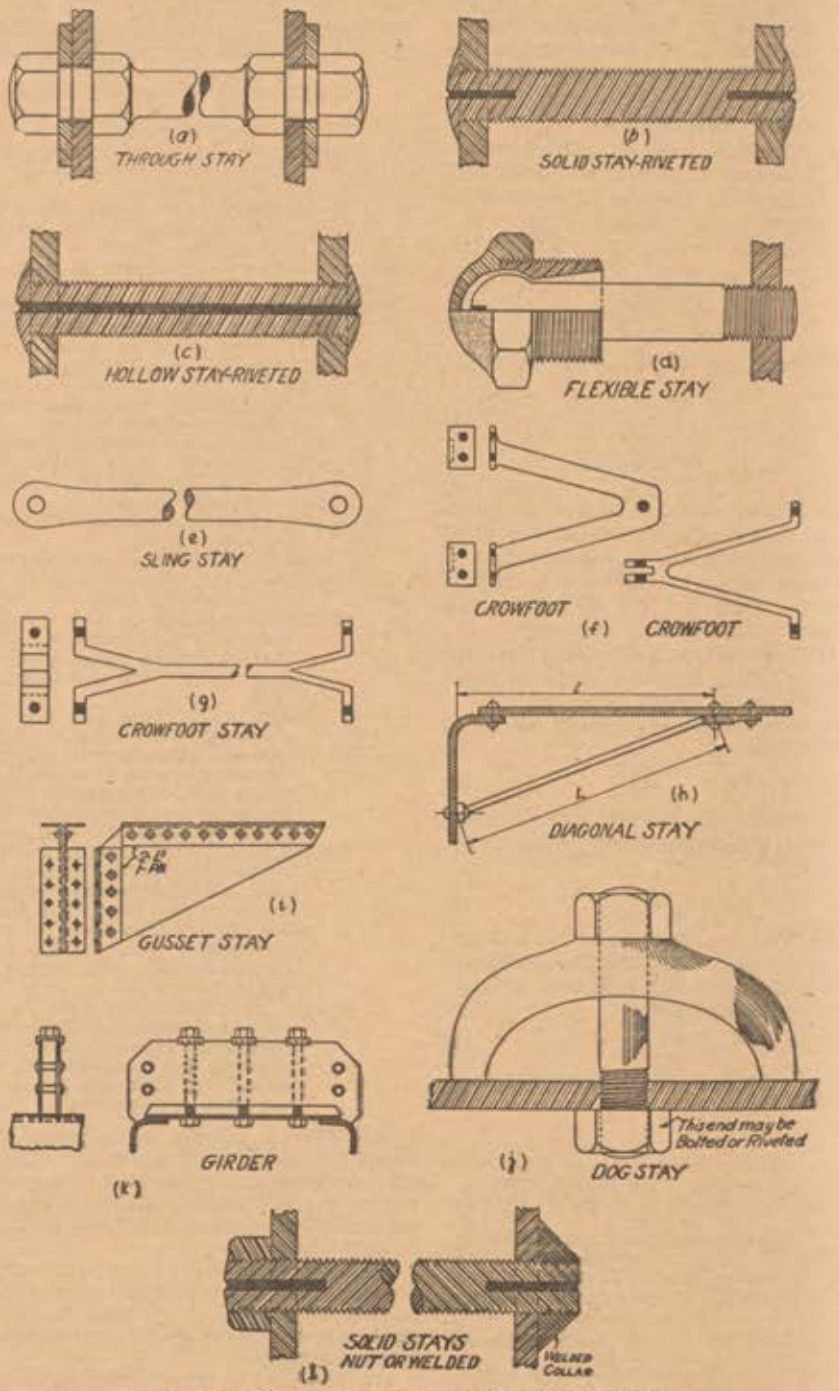


FIGURE 52.35–1—Acceptable types of boiler stays.

§ 52.35–5 Materials.

(a) Round bar stays which require no welding or forging other than upsetting at the ends for threading or to form eyes for use in conjunction with crowfeet, or similar fastenings, shall conform to the requirements of Subpart 51.07, 51.10, or 51.13 of this subchapter.

(b) Crowfeet, lugs, and similar connections for stays shall be forgings without welds conforming to the requirements of Subpart 51.46 of this subchapter.

(c) Forged-welded stays or parts thereof shall conform to the requirements of Subpart 51.13 of this subchapter. All welds in the body of the stay shall be made by the hammer-weld process.

(d) Stiffeners made of structural shapes shall conform to the requirements specified in Subpart 51.10 of this subchapter.

(e) Gusset and diagonal stays made of steel plate, also doubling plates and girders shall conform to the requirements specified in Subpart 51.04 of this subchapter.

(f) Stay tubes shall conform to the requirements of Subpart 51.25 of this subchapter.

(g) Rivets shall conform to the following requirements:

Steel rivets	Subpart 51.07
Iron rivets	Subpart 51.13

(h) Nuts for screw stays shall be made of steel, conforming to the requirements of Subpart 51.46 or 51.49, or, refined wrought iron, conforming to the requirements of Subpart 51.13 of this subchapter.

§ 52.35–10 Workmanship.

(a) The ends of stay bars and stay tubes which are upset for threading shall be subsequently annealed.

(b) Holes for screw staybolts shall be drilled and tapped fair and true and shall have a full thread.

(c) All holes for rivets shall be drilled and shall be slightly counter-sunk in order to form a fillet at point and head. Rivets shall be of sufficient length to fill the rivet holes completely and to form a head of proportionate strength to the body of the rivet.

(d) Holes for tubes or through stays may be made by punching a pilot hole in the center, but shall be machined to size by a rotating cutter, or otherwise be drilled from the solid plate.

(e) When jointed longitudinal stays are fitted between the back and front tube plates and connected by pins, such pins may be fitted slack in the holes, but the total clearance on both ends shall not exceed $\frac{1}{16}$ inch.

(f) Where stay tubes are used for supporting flat surfaces they shall be fitted with threads at both ends, screwed into the tube sheets and rolled tight with expanders, in addition to which they may be beaded. Making such tubes tight by calking is not permissible.

§ 52.35–15 Computations.

(a) The maximum allowable pressure and the required area of direct stays shall be computed by the following formulas (in making computations, the least sectional area of the stay shall be taken):

$$P = \frac{aC}{A} \quad (1)$$

$$a = \frac{PA}{C} \quad (2)$$

where:

P = maximum allowable pressure, in pounds per square inch.
A = area supported by the stay, in square inches.
a = required cross-sectional area of stay, in square inches.
C = coefficients based on the minimum tensile strength of the material used, as follows:
- C = 10,000 for solid steel through stays.
- C = 9,000 for solid steel screw stays having diameters of 1 inch and above.
- C = 9,000 for jointed steel stays.
- C = 8,000 for solid or hollow steel screw staybolts having diameters of 1 inch or less.
- C = 8,000 for refined wrought-iron stays or staybolts having diameters of 1 inch and above.
- C = 8,000 for steel stays formed from plates without welds.
- C = 7,500 for wrought-iron or steel stay tubes.
- C = 7,500 for flexible screw staybolts.
- C = 7,500 for refined wrought-iron screw staybolts having diameters less than 1 inch.
- C = 6,000 for welded refined wrought-iron stays.

(b) In computing the gross area supported by a stay, the pitch of the stays shall be used, but the least sectional area of the stay may be deducted therefrom to obtain the net area.

(c) Where stays are adjacent to the outer edge of the surface to be stayed and special allowances are made for the spacing, the area A shall be determined by deducting such parts of the surface as may be considered self-supporting in accordance with § 52.30–5.

(d) The required cross-sectional area of a diagonal stay shall be determined by the following formula:

$$a_1 = \frac{aL}{l} \quad (3)$$

where:

a_1 = required area of diagonal stay, in square inches.
a = required area of direct stay computed by formula (2) in this section, in square inches.
L = length of diagonal stay as shown by figure 52.35–1 (h), in inches.
l = length of line drawn at right angles to the surface to be supported, and extending to the center of the first rivet in the diagonal stay as shown by figure 52.35–1(h), in inches.

(e) The minimum sectional area of a gusset stay constructed of triangular plates secured to single or double rolled shapes along the two sides, shall be 10 percent greater than that determined by formula (3) in this section for diagonal stays.

(f) In determining the net cross-sectional area of drilled or hollow staybolts, the cross-sectional area of the hole shall be deducted if the diameter exceeds $\frac{5}{16}$ inch.

(g) Where a cylindrical shell is pierced by more than three holes for stays or other purposes on a line parallel with the axis of the shell, the relative strength of the ligaments between such holes shall not be less than that of the ligaments in the outer row of rivets in the longitudinal joint. If the construction necessitates a lower relative strength, this must be used for the value of E in the formula (1), (2), or (3) in § 52.05–10, for determining the maximum allowable pressure or minimum thickness of plate.

(h) The minimum sectional area of a pin subject to double shear shall be at least 80 percent of the required cross-sectional area of the stay.

(i) Each branch of a crowfoot or similar component part of a divided stay shall be proportioned to support at least two-thirds of the entire load.

(j) Eyes for pin connections shall be properly formed to the body of the stays. The minimum outside diameter of the eye shall be one and one-fourth times that of the pin. The minimum thickness of a single eye shall be the diameter of the pin; that of the double eye shall be two-thirds of the diameter of the pin; the cross-sectional area of any part of an eye shall be such that the two sides of a single eye shall equal at least one and one-fourth, and the four sides of a forked eye shall equal at least one and one-half times the strength of the body of a stay.

(k) The strength of the rivets connecting crowfoot braces, or any other type of reinforcement, shall equal one and one-half times the strength of the connecting stay.

(l) Palms, lugs, or flanges which are to be riveted, shall have a minimum width at the rivet hole exceeding the diameter of the rivet head, and shall have a cross-sectional area exclusive of the rivet hole not less than one and one-fourth times the required cross-sectional area of the body of the stay. Where there are two or more rivets located in the longitudinal axis of the stay, the strength of the palm or lug at the second or subsequent rivet hole may be reduced to not less than one and one-fourth times the combined strength of the rivet at that point and those beyond.

§ 52.35–20 Detail requirements.

(a) All screw staybolts, except flexible staybolts, shall have a telltale hole in the center of each end not less than $\frac{5}{16}$ inch diameter extending not less than $\frac{1}{2}$ inch beyond the inside of the plate.

(b) Joining of steel stays in the body by any process of welding is not permissible.

(c) The length of screw staybolts shall not exceed 20 diameters.

(d) Where the length of a boiler exceeds 18 feet, the through stays shall be supported in the middle.

(e) Where the heads of screw staybolts are riveted over, the end of the staybolt before riveting shall extend not less than $\frac{1}{4}$ inch from the surface of the plate to provide sufficient material for a substantial head.

(f) Arc welding may be used in lieu of threading or riveting for the attachment of stays or staybolts to plates in conformance with the following requirements:

(1) The stays or staybolts shall be inserted into holes through the plate, ex-

cept as provided for in subparagraph (5) of this paragraph, and the area of the weld in shear measured parallel to that portion of the stay extending through the plate shall be not less than 1.25 times the required cross-sectional area of the stay, but in no case shall the leg of the weld be less than ⅜ inch.

(2) The face of the weld shall not terminate below the outside surface of the plate.

(3) The ends of the stays or staybolts inserted through the plate shall not project more than ⅜ inch beyond surfaces exposed to the products of combustion.

(4) When flat heads are supported by diagonal stays protruding through the shell, the cross-sectional area of the portion of the stay extending through the shell shall not be less than 1.25 times the required cross-sectional area of the stay.

(5) Diagonal stays may be attached to the inner surface of the shell, but not the head, by fillet welds only, provided:

(i) The leg of the welds is not less than ⅜ inch;

(ii) The cross-sectional area of the portion of the stay welded to the shell and also the cross-sectional area of the fillet welds parallel to the axis of the shell, measured at the throat, are not less than 1.25 times the cross-sectional area of the stay;

(iii) The fillet welds shall be continuous around the full length of the sides and ends of the stay; and,

(iv) The palm end of the stay shall be hot formed to the radius of curvature of the shell.

(6) If the stay or staybolt is not normal to the plate, the point where the projection of the longitudinal center line of the stay or staybolt intersects the inner surface of the plate shall fall within the outer boundaries of the weld (projected if necessary).

(7) Welded collars may be used in lieu of nuts to attach screw staybolts to plates, provided the legs of the welds are of sufficient length to develop a strength of at least 25 percent of the staybolt, but in no case shall the legs of the welds be less than ¼-inch in length.

(8) The welding, except where welded collars are used, shall be stress-relieved in accordance with § 56.01-70 of this subchapter.

(9) Telltale holes are not required in stays or staybolts attached by welding, except where screw staybolts are used.

(g) The minimum thickness of nuts used in connection with screw stays shall be one-half of the diameter of the stay, but in no case less than ¾ inch. The stays shall be so placed in relation to the joints that the plates can be calked without removing the nuts.

(h) Nuts shall not be fitted to staytubes at the combustion chamber end.

(i) The ends of stays fitted with nuts shall not be exposed to the direct radiant heat of the fire.

(j) The minimum thickness of staytubes measured at the root of the threads shall be ¼ inch for marginal staytubes and $\frac{5}{16}$ inch for other staytubes.

Subpart 52.40—Tube Sheets of Water-Tube Boilers

§ 52.40-1 Definitions.

(a) *Curved tube sheet.* Curved tube sheet is a section of the shell of a boiler drum formed to an arc of a circle and perforated for nests of tubes.

(b) *Flat tube sheet.* Flat tube sheet is the tube plate of box headers of certain types of water-tube boilers.

(c) *Longitudinal ligament.* Longitudinal ligament is the minimum section of metal between two tube holes on a line parallel with the axis of the drum.

(d) *Circumferential ligament.* Circumferential ligament is the minimum section of metal between two tube holes on a line around the circumference of the drum.

(e) *Diagonal ligament.* Diagonal ligament is the minimum section of metal between two tube holes in adjacent rows, measured diagonally from one row to the other.

§ 52.40-5 Computations for curved tube sheet.

(a) The maximum allowable pressure and minimum thickness of a cylindrical shell pierced for tubes and of a curved tube sheet shall be calculated by formula (1), (2), or (3) of § 52.05-10, using the lowest value of E, determined in accordance with this section.

(b) (1) Where cylindrical shells are pierced by a single row of tubes or by two or more rows so placed in the cylindrical shell as not to be considered nests of tubes, as in a double buttstrap joint, or where reinforcing plates are fitted, the ligament efficiency between tube holes shall be computed by formula (1) of this section. For tube rows other than those placed on the longitudinal joint, the shell if necessary shall be either reinforced or increased in thickness.

(2) The relative strength of the ligaments between tube holes which come in a single line in a buttstrap joint or reinforced shell, shall be computed by the following formula:

$$E=\frac{(p-d)T_1}{pT} \qquad (1)$$

where:

E = relative strength of ligament.
p = pitch of tubes, in inches.
d = diameter[1] of tube holes, in inches.
T = thickness of shell, in inches.
T_1 = the aggregate thickness of the two buttstraps, or the shell and reinforcing plate, in inches.

[1] Where the tube hole is not of the straight bore type, the equivalent diameter shall be calculated by dividing the cross-sectional area of the removed metal by the material thickness.

(c) When a shell is pierced for tubes in a series of rows parallel to its axis, the efficiency of the ligament between the tube holes in any row shall be determined as follows:

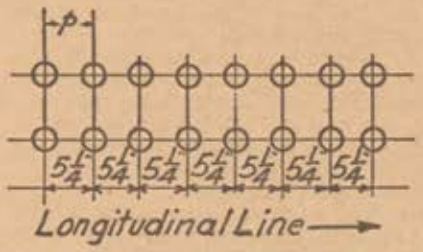


FIGURE 52.40-5 (c1)—Example of tube spacing with pitch of holes equal in every row.

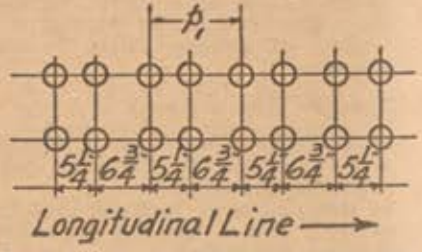


FIGURE 52.40-5 (c2)—Example of tube spacing with pitch of holes unequal in every second row.

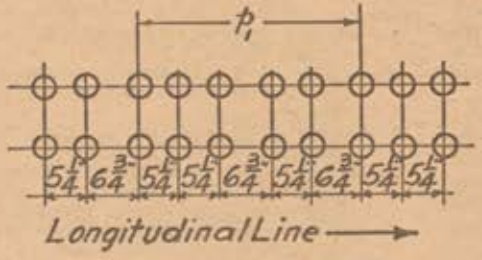


FIGURE 52.40-5 (c3)—Example of tube spacing with pitch of holes varying in every second and third row.

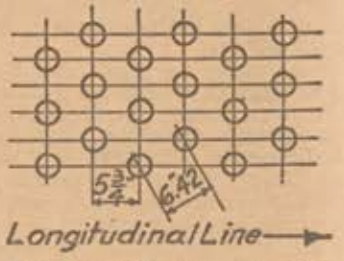


FIGURE 52.40-5 (c4)—Example of tube spacing with holes on diagonal lines.

(1) When the pitch of the tube holes in any row is uniform. (See figure 52.40-5 (c1).)

$$E=\frac{p-d}{p} \qquad (2)$$

(2) When the pitch of the tube holes in any row is not uniform. (See figures 52.40-5 (c2) and 52.40-5 (c3).) The calculations shall be made for a section of the row not exceeding the diameter of the shell.

$$E=\frac{p_1-nd}{p_1} \qquad (3)$$

(3) When the holes in one row are placed so as to form diagonal ligaments with the holes in an adjacent row. (See figure 52.40-5 (c4).) The efficiency of these ligaments shall be taken from the

diagram figure 52.40–5(c5). To use this diagram compute the value of $\frac{p_d}{p}$ and also the efficiency of the longitudinal ligament. Next find in the diagram, the vertical line corresponding to the longitudinal efficiency of the ligament and follow this line vertically to the point where the diagonal line representing the ratio of $\frac{p_d}{p}$ intersects. By projecting this line horizontally to the left on the edge of the diagram, the diagonal efficiency of the ligament may be read from the scale. If this efficiency is less than that of the longitudinal ligament it shall be used in computing the allowable pressure.

(4) The symbols used in the formulas in this paragraph mean:

E = relative strength of the ligament.
p = longitudinal pitch of tube holes, in inches.
p_d = diagonal pitch of tube holes, in inches.
p_1 = unit length of section of the row considered, in inches.
d = diameter [3] of tube holes, in inches.
n = number of tube holes in section p_1.

[3] Where the tube hole is not of the straight bore type, the equivalent diameter shall be calculated by dividing the cross-sectional area of the removed metal by the material thickness.

(d) The pitch of the tube holes shall be measured either on the flat plate before rolling or on the middle line of the plate after rolling.

(e) The strength of the circumferential ligaments between tube holes shall be at least one-half the required strength of the longitudinal ligaments.

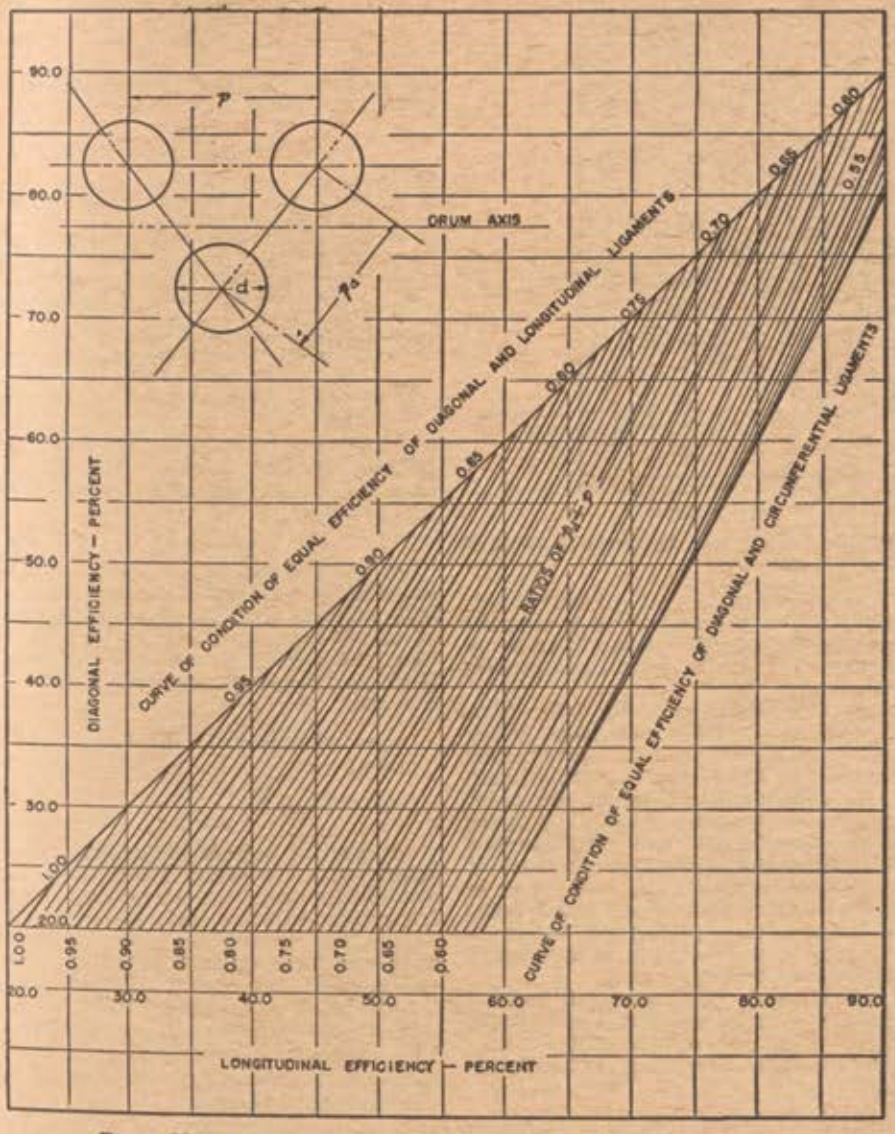


FIGURE 52.40–5 (c5)—Diagrammatic computation of diagonal efficiency.

(f) When the tube holes are not normal to the plate, the plate thickness shall be sufficient to provide a parallel seating not less than ⅜ inch depth between planes at right angles with the axis of the tube for tubes 2½ inches in diameter and under; for tubes having diameters over 2½ inches, the depth of the parallel seating shall not be less than ½ inch.

§ 52.40–10 Reinforcement of ligaments.

(a) Where reinforcing plates are applied to the drums of water-tube boilers to strengthen the shell at the point where the tubes enter, they shall be riveted to the shell, and where outside calking is used, the tubes shall be expanded into the inner and outer plates so that the rivets and tubes will hold the plates together in accordance with the regulations for stayed surfaces.

(b) The rivet spacing with respect to the tubes shall conform to the requirements of Subparts 52.30 and 52.35, using a value of 250 for C, and shall be based on a unit pressure equal to the pressure that can be carried by the inner plate with a factor of safety of 5. The shearing strength of the rivets securing the reinforcing plate on each side of the tube line shall be at least equal to the required strength of the ligament of the reinforcing plate between the tubes.

(c) The combined drum shell and reinforcing plate or plates, and riveted connections, shall have a factor of safety of not less than 5 in the ligaments when calculated in accordance with § 52.40–5. When reinforcing plates or butt-straps are exposed to the products of combustion, the joints shall be protected therefrom.

§ 52.40–15 Unsymmetrical ligaments.

(a) When tubes or holes are unsymmetrically spaced, the average ligament efficiency shall be not less than that required by this section, which applies to ligaments between tube holes and not to single openings. When this procedure results in lower efficiencies than those for symmetrical groups which extend a distance greater than the inside diameter of the shell as covered by § 52.40–5, the efficiencies computed by § 52.40–5 may be used.

(b) For a length equal to the inside diameter of the shell for the position which gives the minimum efficiency, the efficiency shall be not less than that on which the maximum allowable pressure is based.

(c) For a length equal to the inside radius of the shell for the position which gives the minimum efficiency, the efficiency shall be not less than 80 percent of that on which the maximum allowable pressure is based.

(d) For holes placed longitudinally along a shell but which do not come in a straight line, the requirements of this section shall apply, except that the equiv-

alent longitudinal width of a diagonal ligament shall be used. To obtain the equivalent width the longitudinal pitch of the two holes having a diagonal ligament shall be multiplied by the efficiency of the diagonal ligament. The efficiency to be used for the diagonal ligaments is given in figure 52.40–15 (d).

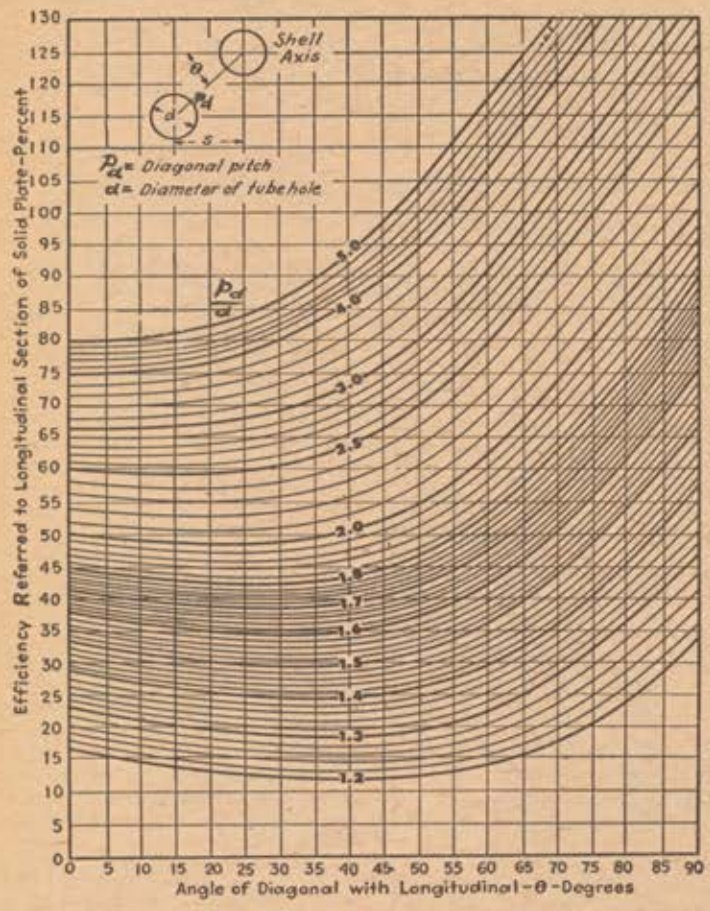


FIGURE 52.40–15 (d)—Diagram for determining efficiency of diagonal ligaments in order to obtain equivalent longitudinal efficiency.

Subpart 52.45—Combustion Chambers and Tube Sheets of Fire-Tube Boilers

§ 52.45–1 Definitions.

(a) *Combustion chamber.* Combustion chamber, within the meaning of this section, is that part of an internally fired boiler in which combustible gases may be burned after leaving the furnace.

(b) *Separate combustion chamber.* Separate combustion chamber is a combustible chamber which is connected to one furnace only.

(c) *Common combustion chamber.* Common combustion chamber is a combustion chamber connected to two or more furnaces in a boiler.

(d) *Crown or top plate.* Crown or top plate is the top of a combustion chamber and is usually supported by girder stays or by sling stays or braces.

(e) *Wrapper sheet.* Wrapper sheet is the side plate of any type of combustion chamber and also the bottom plate of a common combustion chamber.

(f) *Curved bottom plate.* Curved bottom plate is the bottom of a separate combustion chamber formed to an arc of a circle and usually designed to be self-supporting.

(g) *Combustion chamber tube sheet.* Combustion chamber tube sheet is the plate forming the end of a combustion chamber in which the tubes are secured.

(h) *Combustion chamber back sheet.* Combustion chamber back sheet is the plate opposite the tube sheet forming the back of the combustion chamber. It is usually stayed to the back head of the boiler by means of screw stay bolts, or, in the case of double-ended boilers, to the back of the combustion chamber of the other end of the boiler.

(i) *Structural stiffeners.* Structural stiffeners are rolled shapes or flanged plates which are used to stiffen a surface which is not entirely self-supporting.

§ 52.45–5 Materials.

(a) All plates forming parts of combustion chambers or fireboxes shall conform to the general specifications for the shell plates.

(b) Structural shapes of any form used for stays and reinforcements shall conform to the requirements of Subpart 51.10 of this subchapter.

§ 52.45–10 Computations.

(a) *Formulas.* The maximum allowable pressure and minimum thickness of all stayed parts of combustion chambers shall be computed in accordance with formulas provided in Subparts 52.30 and 52.35, except as follows:

(b) *Tube sheets.* (1) When the crown plate of a combustion chamber is supported by girders, transmitting the load to the tube plate and back sheet, thus subjecting the ligaments of the tube sheet to a compressive stress, the maximum allowable pressure shall be determined by formulas in Subparts 52.30 and 52.35, but shall not exceed that given by the following formula:

$$P=\frac{2CT(p-d)}{Lp} \qquad (1)$$

nor shall the thickness be less than that given by formula:

$$T=\frac{LpP}{2C(p-d)} \qquad (2)$$

where:

P = maximum allowable pressure, in pounds per square inch.
p = least horizontal pitch of tubes, in inches.
L = total length of combustion chamber over the tube sheet and back sheet, in inches.
T = thickness of tube plate, in inches.
C = 13,300 the allowable crushing stress in pounds per square inch.
d = inside diameter of plain tubes, in inches.

(2) Where tubes are staggered, the vertical distance between the center lines of tubes in adjacent rows shall not be less than

$$\tfrac{1}{2}\sqrt{2dp+d^2} \qquad (3)$$

(c) *Curved bottom plate without reinforcement.* (1) The maximum allowable pressure and minimum thickness of curved bottoms of separate combustion chambers without reinforcement shall be computed by the following formulas:

$$P=\frac{26}{R}(300T-1.03L) \qquad (4)$$

$$T=\frac{\frac{PR}{26}+1.03L}{300} \qquad (5)$$

(d) *Curved bottom plate with reinforcement.* (1) When the bottoms of combustion chambers are reinforced by structural stiffeners, such as angle or T bars, the minimum thickness of such bars shall be equal to 80 percent of the thickness of the plate reinforced, and the depth of web shall be equal to at least one-half the pitch of the stiffeners. The maximum allowable pressure and minimum thickness shall be computed by the following formulas:

$$P=\frac{(480T)^2}{2RL} \qquad (6)$$

$$T=\frac{\sqrt{2RLP}}{480} \qquad (7)$$

(2) The spacing and size of the rivets attaching the stiffeners to the plates shall comply with the requirements of Subparts 52.30 and 52.35, for stayed surfaces.

(e) *Symbols.* The symbols to be used in connection with the formulas in paragraphs (c) and (d) of this section are:

P = maximum allowable pressure, in pounds per square inch.
T = thickness of plate, in inches.
R = external radius to which plate is formed, in inches.
L = length of plate between supports measured on a line parallel to the axis of the boiler, in inches.

(f) *Girders or crown bars.* The maximum allowable pressure and the minimum thickness of crown bars or girders supporting the tops of combustion chambers shall be computed by the following formulas:

$$P = \frac{Cd^2T}{(L-p_2)p_1L} \quad (8)$$

$$T = \frac{PLp_1(L-p_2)}{Cd^2} \quad (9)$$

where:

P = maximum allowable pressure, in pounds per square inch.
L = length of girder between supports (from inside of tube sheets to inside of combustion chamber back plate), in inches.
p_1 = pitch between girders from center to center, in inches.
p_2 = pitch of supporting bolts, in inches. (Not to exceed maximum allowable pitch for plate thickness; see subpart 52.30.)
d = depth of girder, in inches.
T = thickness of girder, in inches (aggregate thickness where girder consists of 2 plates).
C = 6,800 where girder is fitted with one supporting bolt.
C = 10,300 where girder is fitted with two or three supporting bolts.
C = 11,400 where girder is fitted with four or five supporting bolts.
C = 12,200 where girder is fitted with six or more supporting bolts.

§ 52.45–15 Detail requirements.

(a) Where structural steel shapes or forged fittings are used to form connections between stays and plates that are not self-supporting, the eyes for rivet or pin connections in such fastenings shall comply with the requirements of § 52.35–15.

(b) Curved bottoms of common combustion chambers shall be considered a flat surface and stayed in accordance with the requirements of Subparts 52.30 and 52.35.

(c) When plates are flanged to form the combustion chamber and back connections, the minimum inner radius shall be not less than one and one-half times the thickness of the plate flanged.

Subpart 52.50—Furnaces and Flues

§ 52.50–1 Definitions.

(a) *Furnace.* Furnace, within the meaning of this subpart, is a firebox or a large flue in which the fuel is burned.

(b) *Corrugated furnace.* Corrugated furnace is a cylindrical shell wherein

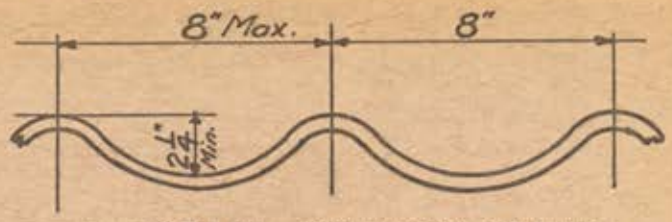


FIGURE 52.50–1 (b1)— Leeds suspension bulb furnace.

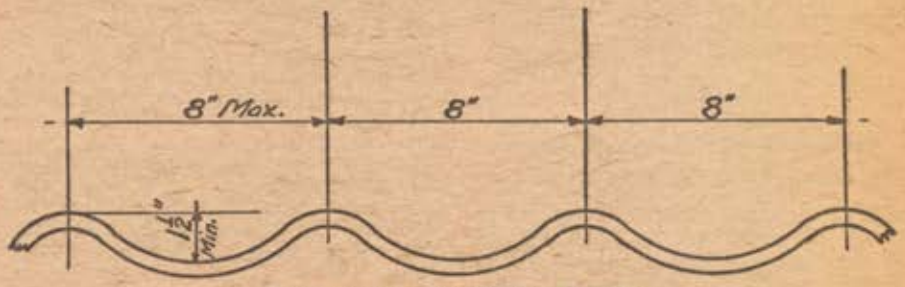


FIGURE 52.50–1 (b2)—Morison furnace.

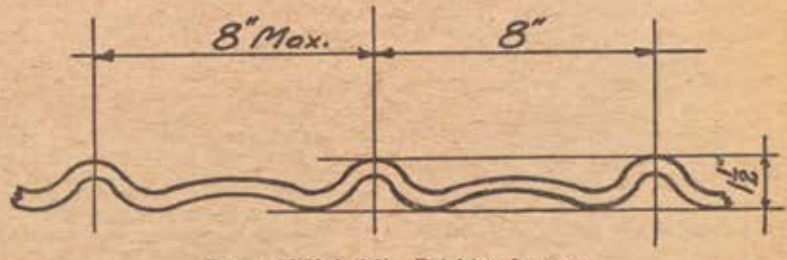


FIGURE 52.50–1 (b3)—Deighton furnace.



FIGURE 52.50–1 (b4)—Fox furnace.

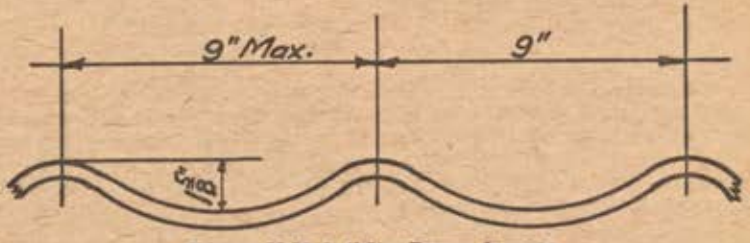


FIGURE 52.50–1 (b5)—Brown furnace.

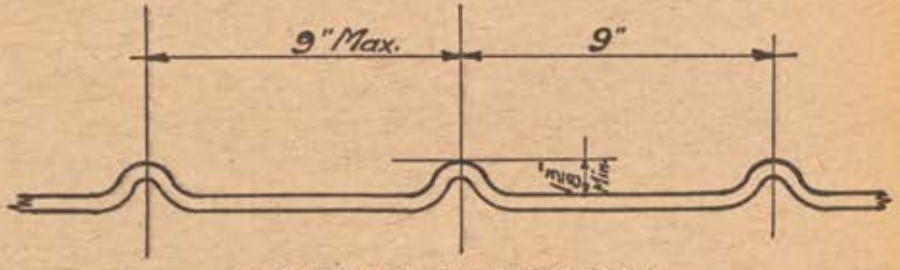


FIGURE 52.50–1 (c)—Purves ribbed furnace.

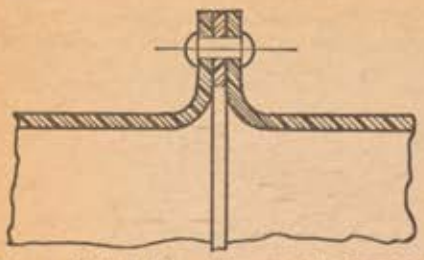


FIGURE 52.50–1 (d)—Adamson ring furnace.

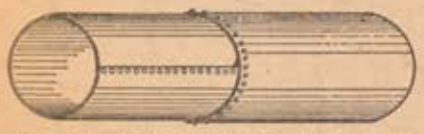


FIGURE 52.50–1 (e)—Circular riveted flue.

corrugations are formed circumferentially for additional strength and to provide for expansion. (See figures 52.50–1 (b1), 52.50–1 (b2), 52.50–1 (b3), 52.50–1 (b4), and 52.50–1 (b5).)

(c) *Purves ribbed furnace.* Purves ribbed furnace is a cylindrical shell in which ribs or projections are formed circumferentially to provide additional strength. (See figure 52.50–1 (c).)

(d) *Adamson ring furnace.* Adamson ring furnace is a cylindrical shell made in short sections, the ends of the sections being flanged and riveted together through a reinforcing ring. (See figure 52.50–1 (d).)

(e) *Plain furnace.* Plain furnace is a cylindrical shell usually made in sections joined by means of riveting or welding. (See figure 52.50–1 (e).)

(f) *Flues.* Flues are cylindrical shells made of seamless or welded tubing, or with a riveted longitudinal joint, the ends being attached by riveting or welding. Their purpose is to provide additional heating surface and to form a path for the products of combustion. (See figure 52.50–1 (e).)

§ 52.50–5 Materials.

(a) Steel plate used in the fabrication of furnaces or flues shall be of firebox quality and shall conform to the specifications and requirements for shell plates.

(b) Seamless, lap welded or electric resistance welded flues may be made of pipe complying with Subpart 51.34 of this subchapter.

§ 52.50–10 Computations.

(a) *Corrugated or ribbed furnaces.* (1) The maximum allowable pressure and minimum thickness of corrugated or ribbed furnaces shall be computed by the following formulas:

$$P=\frac{CT}{D} \quad (1)$$

$$T=\frac{DP}{C} \quad (2)$$

where:

P = maximum allowable pressure, in pounds per square inch.
T = minimum thickness of plate, in inches.
D = external diameter of furnace at bottom of corrugations, in inches.
C = coefficients, as follows:
C = 15,700 for Leeds suspension bulb furnace.
C = 14,700 for Morison or Deighton furnace.
C = 12,500 for Fox, Purves, or Brown furnace.

(2) The spacing and depth of the corrugations shall be in accordance with figures 52.50–1 (b1), 52.50–1 (b2), 52.50–1 (b3), 52.50–1 (b4), 52.50–1 (b5), and 52.50–1 (c), as shown in § 52.50–1. New furnaces shall be rolled to practically a true circle. The maximum distortion permissible from the true circle shall not exceed ¼ inch, and all new furnaces shall be measured by an inspector to ascertain that this tolerance has not been exceeded.

(b) *Adamson ring or plain furnaces.* The maximum allowable pressure and minimum thickness of furnaces of the Adamson ring or plain cylindrical types shall be computed by the following formulas:

$$P=\frac{52}{D}(300T-1.03L) \quad (3)$$

$$T=\frac{\frac{PD}{52}+1.03L}{300} \quad (4)$$

where:

P = maximum allowable pressure, in pounds per square inch.
D = external diameter of furnace shell, in inches.
L = length of a section for Adamson ring furnaces or riveted flues, or total length between centers of head rivet seams where the flues are made without circumferential joints, in inches.
T = thickness of plate, in inches.

(c) *Flues.* (1) The maximum allowable pressure and minimum thickness of plain riveted flues shall be computed by formulas (3) and (4) provided in paragraph (b) of this section. For seamless or welded flues not less than 6 nor more than 18 inches in outside diameter and subject to external pressure, the following formulas shall be used:

$$P=\frac{86670T-1386D}{5D} \quad (5)$$

$$T=\frac{D(5P+1386)}{86670} \quad (6)$$

where:

P = maximum allowable pressure, in pounds per square inch.
T = thickness of flue, in inches.
D = external diameter of flue, in inches.

(2) As a matter of convenience, table 52.50–10 is computed from the preceding formulas for seamless or welded flues.

TABLE 52.50–10—MAXIMUM ALLOWABLE PRESSURE AND MINIMUM THICKNESS OF SEAMLESS OR WELDED FLUES SUBJECT TO EXTERNAL PRESSURE

Outside diameter of flue, inches	Maximum allowable pressure in pounds per square inch						
	100	120	140	160	180	200	220
	Thickness of flue (inches)						
6	0.130	0.137	0.144	0.151	0.158	0.165	0.172
7	.152	.161	.169	.177	.185	.193	.201
8	.174	.184	.193	.202	.211	.221	.229
9	.196	.206	.217	.228	.238	.248	.258
10	.218	.229	.241	.253	.264	.276	.287
11	.239	.252	.265	.278	.290	.303	.316
12	.261	.275	.289	.303	.317	.331	.344
13	.283	.298	.313	.328	.343	.359	.373
14	.305	.321	.337	.354	.369	.386	.402
15	.326	.344	.361	.379	.396	.414	.430
16	.348	.367	.385	.405	.422	.441	.459
17	.370	.390	.409	.430	.448	.469	.488
18	.392	.413	.433	.455	.475	.497	.516

§ 52.50–15 Detail requirements.

(a) The minimum thickness of furnaces shall be 5/16 inch, and the maximum thickness of furnaces shall be 13/16 inch. When the frabricated thickness of a furnace exceeds 13/16 inch, acceptance of the furnace will be given special consideration by the Commandant.

(b) Where furnaces are constructed with riveted joints, the minimum efficiency of such joints shall not be less than 50 percent of the solid plate. Such joints may be of the lap-riveted type provided the furnace does not exceed 36 inches in length or height. All longitudinal riveted joints shall be located at the bottom of the furnace or flue.

(c) The thickness of corrugated and ribbed furnaces shall be ascertained by actual measurements taken by an inspector. Such furnaces shall be drilled by the manufacturer for a ⅜-inch pipe tap and fitted with a screw plug which can be removed by the inspector when taking measurements, the plug to be located as follows:

(1) *For Leeds, Morison, Deighton, Fox, and Brown types of furnaces.* At the crest of the waterside corrugation, not less than four corrugations from either end.

(2) *For Purves ribbed furnaces.* At the center of the second flat from either end.

(3) *Test plug.* Furnaces shall be installed so that the test plug is located at the bottom.

(d) (1) Adamson ring furnaces shall be made in sections not less than 18 inches and not more than 24 inches in length. They shall be flanged with a radius measured on the fire side of not less than three times the thickness of the plate and the flat portion of the flange outside of the radius shall be at least three times the diameter of the rivet holes.

(2) The distance from the edge of the rivet holes to the edge of the flange shall be not less than the diameter of the rivet holes and the diameter of the rivets before driving shall be at least ¼ inch larger than the thickness of the plate.

(3) The depth of the reinforcing ring between the flanges shall be not less than three times the diameter of the rivet holes and the ring shall be substantially riveted to the flanges.

(4) The fire edge of the ring shall terminate at or outside the point of tangency to the curve of the flange and the thickness of the ring shall be not less than ½ inch.

(e) When furnaces are flanged for attachment to the front head or rear tube sheet, the minimum inner radius shall be not less than twice the thickness of the furnace plate flanged.

(f) Where externally fired boilers are fitted with flues exceeding 5 inches in diameter the minimum water space between the flues and/or between the wall of a flue and the shell of the boiler, shall not be less than 3 inches, measured at the middle of the flue.

(g) Plain or corrugated furnaces may be constructed by arc welding. The longitudinal and circumferential joints shall be of the double-welded butt type, and the following modifications in the

requirements for Class I welded pressure vessels will be acceptable:

(1) The customary test plates need not be furnished, provided each furnace has sufficient material left on one end to obtain two guided side bend specimens, which shall not be detached until all the work and heat treatment on the furnace has been completed. One retest will be permitted for each specimen failing to meet the specified requirements.

(2) Radiographic examination of the furnace seam is not required, but will be accepted in lieu of the guided side bend specimens. If radiographs are taken, they shall meet the requirements of § 56.05–5 of this subchapter except that the films will not be retained by the Coast Guard.

Subpart 52.55—Boiler and Superheater Tubes

§ 52.55–1 Definitions.

(a) *Tubes.* Tubes, within the meaning of this subpart, are cylindrical shells of comparatively small diameter constituting the main part of the heating surface of a boiler or superheater.

(b) *Safe end.* Safe end is a short piece of boiler tube which is usually thicker than the ordinary tube and is welded to a tube of lighter gauge for the purpose of lengthening it.

(c) *Seamless tube.* Seamless tube is a tube without any longitudinal joint.

(d) *Electric-resistance-welded tube.* Electric-resistance-welded tube is a tube the longitudinal joint of which is made by the electric-resistance butt welding process and the tube is required to be normalized after welding.

(e) *Stay tube.* Stay tube is a thick-walled tube, the end of which is usually thickened by upsetting to compensate for threading. Such tubes are used for staying tube sheets into which they are screwed and expanded.

(f) *Expanding.* Expanding is the process of enlarging the end of a tube to make it fit tightly in the tube sheet.

(g) *Beading.* Beading is the process of turning over the protruding end of a tube after expanding to form a supporting collar for the tube sheet.

(h) *Bell-mouthing.* Bell-mouthing is the process of flaring the end of a tube beyond where it is expanded in the tube sheet.

§ 52.55–5 Materials and workmanship.

(a) Seamless steel boiler tubes shall comply with the requirements of Subpart 51.25 of this subchapter for such tubes.

(b) Electric-resistance-welded steel and iron boiler tubes shall comply with the requirements of Subpart 51.25 of this subchapter for such tubes.

(c) Tube holes shall be drilled full size in the solid plate. Tube holes may be counterbored where the metal is thicker than that required to obtain a proper bearing by expanding, so as to form narrow seats into which the tube ends can be properly expanded, provided there is space available to permit a proper amount of flare of the tube end.

(d) (1) The ends of tubes of fire-tube boilers shall be rolled tight in the tube sheet and the ends shall be beaded over; or the ends rolled, beaded and seal-welded around the edge of the bead; or the ends rolled and strength welded.

(2) Tube ends attached by rolling and strength welding shall comply with the following requirements:

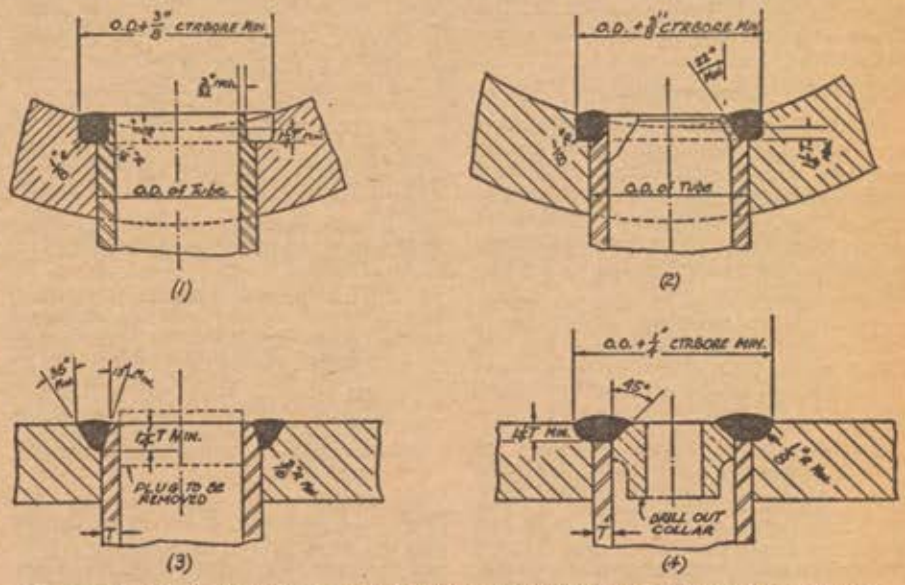


FIGURE 52.55–5(f)—Acceptable types of welded attachments of boiler tubes to headers.

(i) Where a bevel or chamfer is employed, the tube sheet shall be machined to a depth at least equal to the thickness of the tubes or ⅛ inch, whichever is greater, and not to exceed one-third of the tube sheet thickness. The projection of the tube beyond the tube sheet shall not exceed a distance equal to the tube thickness, and in no case more than one-third of the tube sheet thickness or ⅛ inch, whichever is greater.

(ii) Where no bevel or chamfer is employed, the tube shall extend beyond the tube sheet not less than a distance equal to 1¼ times the tube thickness, nor more than twice the tube thickness, but in no case shall the distance be less than ⅛ inch nor more than ¼ inch.

(iii) When any type of welded attachment is employed, the tube shall be rolled before welding and again rolled lightly after welding.

(3) The inner surface of tube holes in any form of attachment may be grooved or chamfered.

(e) (1) The ends of all tubes and nipples shall be expanded and flared not less than ⅛ inch over the diameter of the tube hole on all water-tube boilers and headers; or they may be flared not less than ⅛ inch, rolled and beaded; or flared, rolled and seal-welded; or rolled and seal-welded without flaring, provided the throat of the seal weld is not less than 5/16 inch nor more than ⅜ inch and the tubes are reexpanded after welding.

(2) The ends of all tubes and nipples of water-tube boilers and superheaters when not seal-welded shall project through the tube sheets or headers not less than ¼ inch nor more than ½ inch before flaring. Where the tubes enter at an angle, the maximum limit of ½ inch shall apply only at the point of least projection.

(3) If tubes and nipples are seal-welded they shall be reexpanded. Stress relieving shall not be used after welding.

(f) (1) Boiler tubes may be arc- or gas-welded to manifolds, headers or drums without being expanded, provided with the requirements of this paragraph. the welds are strength welds complying

(2) Economizer and waterwall tubes not exceeding 2 inches in size may be attached to headers by means of socket-welded joints, provided the depth of the socket is the maximum allowable but in no case less than ⅜ inch and the diameter is not greater than 1/64 inch above that of the tube. The throat dimension of the fillet weld shall be at least 1¼ times the tube wall thickness and the weld shall be deposited with a minimum of two layers. High amperage shall be employed with the electrode to obtain good penetration of the root pass.

(3) Boiler tubes, not exceeding 2 inches in size, may be attached to headers or drums by any of the acceptable types of groove welds as shown in Figure 52.55–5 (f). The welding grooves shall be of such depth and form as to insure full penetration of the weld metal. The

depth of the groove shall be at least 1¼ times the thickness of the tube, but in no case less than ⅛ inch in any direction. The welding procedure shall be submitted to the Commandant for consideration prior to the welding of superheater tubes of alloy material.

(4) Stress relief and radiographic examination of the welds are not required, except that the welds shall be examined by magnetic particle testing or other acceptable method, when alloy steel materials containing chromium are welded.

(5) Other types of welded attachments having strength equivalent to the above will be considered by the Commandant.

§ 52.55–10 Computations.

(a) (1) The maximum allowable pressure and the minimum thickness of seamless and electric-resistance-welded carbon and seamless alloy steel tubes or nipples subject to internal pressure for water-tube boilers, economizers and superheaters shall be computed by the following formulas:

$$P=S\left[\frac{2T-0.027D-2e}{D-2T+0.027D+2e}\right] \quad (1)$$

$$T=\frac{D}{2}\left(\frac{P}{P+S}\right)+0.0135D+e \quad (2)$$

where:

P = maximum allowable pressure, in pounds per square inch. Where the calculated maximum allowable pressure exceeds an even unit of 10 by more than 1, the next higher unit of 10 may be used.

S = Maximum allowable stress, in pounds per square inch, as given in Table 52.05–10 (a), at not less than the mean wall temperature, which in no case shall be taken as less than 700 degrees F. for tubes absorbing heat. The mean wall temperature of generating tubes shall be taken as the corresponding temperature of saturated steam at design conditions plus 50 degrees F. The mean wall temperatures of superheater tubes in each pass of a superheater shall be certified to by the boiler manufacturer. For tubes which do not absorb heat, the mean wall temperature shall be taken as the temperature of the liquid within the drum.

T = thickness of the tube wall, in inches.

D = outside diameter of the tube, in inches.

e = 0.04 over a length at least equal to the length of the seat plus 1 inch, for tubes expanded into tube seats, except:

e = 0 for tubes expanded into tube seats provided the thickness of the tube ends over a length at least equal to the length of the seat plus 1 inch is not less than the following:

0.095 inch for tubes 1¼-inch OD and smaller.

0.105 inch for tubes above 1¼-inch OD and up to 2-inch OD, inclusive.

0.120 inch for tubes above 2-inch OD and up to 3-inch OD, inclusive.

0.135 inch for tubes above 3-inch OD and up to 4-inch OD, inclusive.

0.150 inch for tubes above 4-inch OD and up to 5-inch OD, inclusive.

e = 0 for tubes strength-welded to headers and drums.

(2) Where tubes are expanded into drums or headers, table 52.55–10(a2) may be used in lieu of formula (1) or (2) for determining the maximum allowable pressure and minimum thickness of seamless or electric-resistance-welded low carbon steel tubes, provided the maximum mean wall temperature does not exceed 700° F.

(3) The thickness of the ends of tubes strength-welded to drums or headers need not be greater than the run of the tube as determined by formula (2), but the thickness of no tube, where expanded into headers or drums, shall be less than that given in table 52.55–10(a3).

TABLE 52.55–10 (a2)—MAXIMUM ALLOWABLE PRESSURES FOR SEAMLESS AND ELECTRIC-RESISTANCE WELDED LOW CARBON STEEL TUBES SUBJECT TO INTERNAL PRESSURE, WHERE EXPANDED INTO DRUMS OR HEADERS [1] [2]

Outside diameter, in inches	Maximum allowable pressure, in pounds per square inch, nearest BWG number and the thickness of tube wall, in inches														
	17 0.055	16 0.065	15 0.075	14 0.085	13 0.095	12 0.105	11 0.120	10 0.135	9 0.150	8 0.165	7 0.180	6 0.200	5 0.220	4 0.240	3 0.260
¾	160	480	820	1,180	1,570										
1		270	520	780	1,040	1,320	1,770								
1¼		210	420	650	880	1,120	1,500	1,910							
1½		160	350	550	750	960	1,300	1,650							
1¾			230	400	560	730	1,000	1,280	1,570	1,870					
2				290	430	570	800	1,030	1,260	1,510	1,770				
2¼				210	340	460	650	840	1,040	1,250	1,470	1,770			
2½					280	370	530	700	880	1,060	1,250	1,500	1,770		
2¾					200	300	450	600	750	910	1,070	1,300	1,530	1,770	
3					160	240	370	510	630	790	930	1,130	1,340	1,550	1,770
3¼						190	320	440	560	690	820	1,000	1,180	1,370	1,570
3½							270	380	490	610	730	890	1,060	1,230	1,400
3¾							220	330	430	540	650	800	950	1,100	1,260
4							190	280	380	480	580	720	860	1,000	1,150
4½								240	340	430	520	650	780	910	1,040
									260	340	420	530	650	760	880

[1] These values have been calculated by Formula (1) in § 52.55–10 (a) using allowable stress values at 700° F. for Grades T83–A, T192, and T178–A tubing.

[2] Where calculated allowable pressures exceed an even unit of 10 by more than 1, the next higher unit of 10 is given in the table.

[3] The maximum allowable pressures for electric-resistance-welded low carbon steel tubes shall be limited to boiler, waterwall, economizer, and superheater tubes that are fully enclosed within the boiler setting. For electric-resistance-welded tubing outside the boiler casing, the maximum allowable pressures shall not exceed 85 percent of the values listed in the table.

TABLE 52.55–10 (a3)—EXPANDED TUBES

Outside diameter, in inches:	*Minimum thickness of expanded tubes, in inches*
¾	0.055
1, 1⅛, 1¼	.065
1½	.075
1¾, 2	.085
2¼, 2½, 2¾	.095
3	.105
3¼, 3½, 3¾	.120
4	.135
4½	.150

(b) (1) The maximum allowable pressure and minimum thickness of seamless or welded boiler tubes less than 6 inches in diameter, and subject to external pressure, shall be computed by the following formulas:

$$P=\frac{14{,}000\ (T-0.065)}{D} \quad (4)$$

$$T=\frac{PD}{14{,}000}+0.065 \quad (5)$$

where:

P = maximum allowable pressure, in pounds per square inch.

T = thickness of tube, in inches.

D = external diameter of tube, in inches.

(2) As a matter of convenience, table 52.55–10 (b) has been computed from the preceding formulas.

TABLE 52.55–10 (b)—MAXIMUM ALLOWABLE PRESSURE AND MINIMUM THICKNESS FOR SEAMLESS OR WELDED BOILER TUBES LESS THAN 6" IN DIAMETER AND SUBJECT TO EXTERNAL PRESSURE

Outside diameter of tube in inches	Maximum allowable pressure, in pounds per square inch, nearest B. W. G. number and thickness of tube wall, in inches						
	13 0.095	12 0.105	11 0.120	10 0.135	9 0.150	8 0.165	7 0.180
1	420	560	770	980			
1¼	280	380	520	660	800	940	
1½	240	320	440	570	680	800	920
1¾	210	280	390	490	600	700	810
2	190	250	350	430	530	630	720
2¼	170	230	310	400	480	560	650
2½		190	260	330	400	470	540
2¾		180	240	310	370	430	500
3		160	220	280	340	400	460
3¼			200	250	300	350	410
3½			180	220	270	320	360
3¾				200	240	280	330
4					220	270	300
4½					220	260	300

§ 52.55–15 Detail requirements.

(a) Seamless or electric-resistance butt-welded tubes shall be used in all construction where the tubes are subject to internal pressure.

(b) Tubes may be lengthened or safe-ended by forge, electric-resistance, arc or gas butt-welding methods. Arc or gas butt welded joints exceeding 2½ inches shall be nondestructively tested as required by § 56.05–5 of this subchapter. Carbon steel tubing material shall be stress-relieved if arc welded, when the diameter exceeds 2½ inches. Alloy steel tubing shall be given a suitable preheat and postheat treatment to produce acceptable welds if deemed necessary by the Commandant.

Subpart 52.60—Superheaters, Headers, Water Walls, and Economizers

§ 52.60–1 Definitions.

(a) *Superheaters.* Superheaters, within the meaning of this subpart, are appliances for the purpose of increasing the temperature of steam.

(b) *Header.* Header is a hollow forging, pipe, or welded plate of cylindrical, square, or rectangular cross section, serving as a manifold to which tubes are connected.

(c) *Water wall.* Water wall is a series of tubes or elements spaced along or integral with a wall of a furnace to protect the wall and provide additional heating surface.

(d) *Economizer.* Economizer is a feed-water heater usually located in the uptake or casing of a boiler to absorb heat from the waste gases.

§ 52.60–10 Materials.

(a) Headers or fittings used in connection with these appurtenances, shall be constructed of steel plate conforming to the requirements of Subpart 51.04 of this subchapter; seamless steel pipe conforming to the requirements of Subpart 51.34 of this subchapter or of steel forgings conforming to the requirements of Subpart 51.46 of this subchapter.

(b) Carbon steel plate or forgings may be used for header end closures for metal temperatures not exceeding 800° F. For temperatures exceeding 800° F., the header end closures shall be wrought alloy steel material. The materials shall conform to the requirements of Subpart 51.04, 51.22 or 51.46 of this subchapter and limited to the grades of material listed in Table 52.05–10(a) of this subchapter.

(c) Alternate materials may be used in the construction of headers, provided such materials are approved by the Commandant for the particular application.

§ 52.60–15 Computations.

(a) The maximum allowable pressure of cylindrical headers shall be determined by Formula (3) in § 52.05–10.

(b) The maximum allowable pressure and minimum thickness of tubes shall be in accordance with the tables and formulas provided in Subpart 52.55.

§ 52.60–20 Detail requirements.

(a) *Superheater.* (1) The design pressure of a superheater integral with the boiler shall be not less than the highest setting of the drum safety valves, except that the superheater outlet connections may have a pressure rating conforming to § 52.70–10(e).

(2) Superheaters fitted in conjunction with water-tube boilers may be considered as a part of the boiler, provided the pipe between the boiler and superheater and between superheaters is made of seamless steel material having a minimum thickness computed by the formula specified for piping in § 55.07–5 of this subchapter. Fittings used in making such connections shall be of forged or cast steel.

(3) Superheater headers in which it is possible for water to accumulate shall be fitted with adequate means for draining.

(4) Superheaters designed for normal operating temperatures in excess of 850° F., at the superheater outlet shall be fitted with controls to insure that the maximum temperature does not rise more than 15° above the design conditions. Visual or audible alarms shall be provided.

(5) Arrangement shall be made for venting the superheater in order to permit steam circulation through the superheater when starting the boiler.

(b) *Economizer.* The design pressure of an economizer integral with the boiler and connected to the boiler drum without intervening stop valves shall be at least equal to 110 percent of the highest setting of the safety valves on the drum.

(c) *Headers.* Headers fabricated by means of arc or gas welding shall comply with the requirements of Part 56 of this subchapter for Class I welded pressure vessels.

Subpart 52.65—Safety Valves

§ 52.65–1 Definitions.

(a) *Safety valve.* Safety valve is a valve designed to open or close automatically to relieve excess pressure in the pressure vessel to which it is attached.

(b) *Spring-loaded safety valve.* Spring-loaded safety valve is a safety valve fitted with a spring which normally holds the valve disk in a closed position against the heat and allows it to open or close at predetermined pressures. Spring-loaded safety valves are characterized by pop action.

(c) *Pressure loaded safety valve.* Pressure loaded pilot actuated safety valve is one which is held in the closed position by steam pressure and controlled in operation by a pilot actuator valve.

(d) *Spring loaded pilot actuated safety valve.* Spring loaded, pilot actuated safety valve is one in which a spring is used in the conventional way to hold the disk against the seat, but which has a piston attached to the spindle and enclosed within a cylinder, which when subjected to a limiting or set pressure, unbalances the spring load thereby opening the valve.

(e) *Spring loaded pilot valve.* Spring loaded pilot valve is a conventional safety valve designed to actuate another spring loaded safety valve through a pressure transmitting line led from the body of the pilot valve.

(f) *Lever safety valve.* Lever safety valve is a safety valve having the disk held on its seat by the action of a weight hung on a lever which is pivoted on a fulcrum.

(g) *Relief valve.* Relief valve is a valve constructed on the general design of safety valves to relieve excess pressure. It may be used for service where an approved safety valve is not required by the regulations of this subchapter. (See § 54.07–5 of this subchapter.)

§ 52.65–5 General requirements.

(a) Each boiler and its superheater shall be provided with one or more approved safety valves designed, constructed and flow-tested in conformance with Subpart 162.001 in Subchapter Q (Specifications) of this chapter. Boilers of more than 500 square feet of water heating surface but without superheaters shall be fitted with at least two safety valves, and boilers with integral superheaters shall have at least two safety valves attached to the drum and one safety valve fitted to the superheater outlet. On river steam vessels whose boilers are connected in batteries without means of shutting off one boiler from another, each battery of boilers shall be treated as a single boiler and equipped with not less than two safety valves of equal size.

(b) Drum safety valves shall be set to relieve at a pressure not in excess of that allowed by the certificate of inspection. Where for any reason this is lower than the pressure for which the boiler was originally designed, an accumulation test, as provided for in paragraph (g) of this section, shall be conducted to insure that the relieving capacity of the safety valve is sufficient for the lower pressure.

(c) The setting of the superheater safety valve shall not exceed the design pressure of the machinery plus the pressure drop in the piping from the superheater outlet to the machinery. To prevent damage to the superheater, the drum safety valves shall be set at a pressure not less than that of the superheater safety valve setting plus 5 pounds minimum plus approximately the normal load pressure drop through the superheater. If there are no intervening valves between the superheater safety valve and boiler, the relieving capacity of the superheater safety valve rated in accordance with the requirements of Subpart 162.001, Subchapter Q (Specifications), may be included in determining the total required relieving capacity of the boiler, provided the drum safety valves have at least 75 percent of the aggregate relieving capacity required. The foregoing requirements do not apply when drum pilot actuated superheater safety valves are used. Installations em-

ploying pilot actuated safety valves will be given special consideration by the Commandant.

(d) In the event the maximum steam generating capacity of the boiler is increased by any means, the relieving capacity of the safety valves shall be checked by an inspector and if determined to be necessary, valves of increased relieving capacity shall be installed.

(e) The total rated relieving capacity of drum and superheater safety valves as certified by the valve manufacturer shall not be less than the maximum generating capacity of the boiler as certified by the boiler manufacturer. The safety valves shall be capable of discharging all the steam that can be generated without allowing the pressure to rise more than 6 percent above the set pressure of the valve.

(f) (1) The boiler manufacturer may certify the normal as well as the maximum generating capacity of the boiler. In the absence of such certification the minimum safety valve relieving capacity shall be determined upon the basis of the pounds of steam generated per hour per square foot of boiler heating surface and the waterwall heating surface, as given in the Table 52.65-5 (f) (1).

TABLE 52.65-5 (f) (1)—MINIMUM RELIEVING CAPACITY

Type of boiler	Minimum pounds of steam per hour per square foot of surface					
	Boiler heating surface			Water wall surface		
	Hand-fired	Stoker-fired	Oil, or pulverized fuel-fired	Hand-fired	Stoker-fired	Oil, or pulverized fuel-fired
Fire-tube	5	7	8	8	10	14
Water-tube	6	8	10	8	12	16

(2) In many cases a greater relieving capacity of safety valves must be provided than required by this paragraph, and in every case the requirements of paragraph (e) of this section shall be met.

(3) The heating surface shall be computed for that side of the boiler surface exposed to the products of combustion exclusive of the superheating surface. In computing the heating surface only the tubes, fireboxes, shells, tube sheets, and the projected area of the headers need be considered. For vertical fire-tube boilers, only that portion of the tube surface up to the middle gauge cock is to be computed. The minimum number and size of safety valves required shall be determined on the basis of the aggregate steaming capacity and the aggregate rated relieving capacity of the valves shall be in accordance with Subpart 162.001 in Subchapter Q (Specifications) of this chapter.

(g) An accumulation test shall be conducted in the presence of an inspector to determine the adequacy of protection provided by the aggregate relieving capacity of the boiler safety valves except in instances where possible damage to superheaters makes this impractical. During this test all steam outlet connections except the safety valves and such others as may be necessary to operate the boiler shall be closed and the fires forced to their maximum capacity for a period of 15 minutes for fire-tube boilers and 7 minutes for water-tube boilers.

(h) On new installations, the safety valve diameter for power boilers, superheaters, or unfired steam generators shall be not less than 1½ inches nor more than 4 inches. Safety valves of 4½ inches diameter may be used for replacements on existing boilers or unfired steam generators. The foregoing diameters apply to the valve inlet.

(i) Lever or weighted safety valves now installed may be continued in use and may be repaired, but when renewals are necessary, lever or weighted safety valves shall not be used. All such replacements shall conform to the requirements of Subpart 162.001 in Subchapter Q (Specifications) of this chapter.

(j) Gags or clamps for holding the safety valve disk on its seat shall be carried on board the vessel at all times.

§ 52.65-15 Installation.

(a) The final setting of boiler safety valves shall be checked and adjusted under steam pressure by an inspector who upon acceptance shall seal the valves. This requirement applies to drum and also superheater safety valves when the latter provide part of the required relieving capacity for the boiler.

(b) Except in the case of superheater valves, safety valves are not to be connected to any fitting with outlets for any purpose other than the escape of steam through the safety valve. They shall be connected directly to the boiler or as close thereto as possible and installed in an upright position with spindles vertical except in the case of especially designed and approved valves.

(c) No shutoff valves shall be placed between the required safety valves and the boiler or unfired steam generator, nor in the escape pipe between the safety valve and atmosphere, nor in the drain pipe from the safety valve.

(d) Twin valves, made by placing individual valves on Y bases, or duplex valves having two valves in the same body, shall be of equal size.

(e) (1) To insure safety valves being free, each safety valve shall have a substantial lifting device by which the valve disk may be positively lifted from its seat when the pressure in the boiler is 75 percent of that at which the valve is set to blow. Such mechanism shall be connected by suitable relieving gear so arranged that the controls may be operated from the fireroom or engineroom floor.

(2) When, due to high pressure, it is impracticable to fit a relieving gear to raise the safety valve from its seat in order to relieve the boiler of pressure, suitable piping and a valve having a relieving capacity of not less than the safety valve(s), may be connected from the boiler to the escape pipe or condenser. The valve shall be arranged to permit operation from the fireroom or engineroom floor.

(f) An independent open drain of a diameter not less than the required tapped drain opening in the valve body shall be run as directly as possible from the body of each boiler safety valve, or the drain from each boiler safety valve may be led to an independent header common only to boiler safety valve drains. The leakoff from drains or drain headers shall be led to suitable locations to avoid hazard to personnel.

Subpart 52.70—Boiler Mountings and Attachments

§ 52.70-1 Definitions.

(a) *Mountings.* Mountings, within the meaning of the regulations in this subchapter, are nozzle connections, distance pieces, valves, or fittings attached directly to the boiler.

(b) *Main stop valve.* Main stop valve is a valve usually connected directly to the boiler for the purpose of shutting off the steam from the main steam line.

(c) *Auxiliary stop valve.* Auxiliary stop valve is a valve usually connected directly to the boiler for the purpose of shutting off the steam from the auxiliary lines (including the whistle lines).

(d) *Manifold.* Manifold is a fitting with two or more branches having valves either attached by bolting or integral with the fitting.

(e) *Feed valve.* Feed valve is a valve in the feed-water line which controls the boiler feed.

(f) *Blow-off valve.* Blow-off valve is a valve connected directly to the boiler for the purpose of blowing out water, scum, or sediment.

(g) *Dry pipe.* Dry pipe is a perforated or slotted pipe placed in the highest part of the steam space of a boiler to prevent priming.

(h) *Water column.* Water column is a fitting or tube equipped with a water glass attached to a boiler for the purpose of indicating the water level.

(i) *Test cocks.* Test cocks are small cocks on a boiler for indicating the water level.

(j) *Salinometer cocks.* Salinometer cocks are cocks attached to a boiler for the purpose of drawing off a sample of water for salinity tests.

(k) *Fusible plugs.* Fusible plugs are plugs made with a bronze casing and a tin filling which melts at a temperature of 450° to 500° F. They are intended to melt in the event of low water and thus warn the engineer on watch.

§ 52.70-5 Materials and workmanship.

(a) Boiler mountings or attachments shall be made of steel forgings conforming to the requirements of Subpart 51.46 of this subchapter; steel castings conforming to the requirements of Subpart 51.58 of this subchapter; or, where the temperature does not exceed 450° F., they may be made of bronze castings conforming to the requirements of Subpart 51.76 of this subchapter.

(b) For temperatures exceeding 450° F., high strength or alloy steel bolting material complying with the requirements of Subpart 51.49 of this subchapter shall be employed. For temperatures

not exceeding 450° F., commercial carbon-steel bolting conforming to the requirements of Subpart 51.49 of this subchapter may be used.

(c) The use of cast iron for mountings, fittings, valves, or cocks, attached directly to boilers operating at pressures exceeding 30 p. s. i. is prohibited.

§ 52.70–10 Detail requirements.

(a) Boiler nozzles, mountings, and attachments having diameters over 1¼ inches shall be fitted with flanged or welded ends. Screwed ends shall not be used for pressures exceeding 600 p. s. i. and shall be limited to ¾-inch pipe size for pressures exceeding 150 p. s. i. Slip-on flanges and socket-welded connections may be used for sizes not exceeding 2 inches in diameter. Butt-welded flanges may be used without diameter limitation.

(b) Where stud bolts are used for the attachment of boiler connections, drilled holes to be tapped for straight threads shall not penetrate within one fourth of the wall thickness from the inside surface of the vessel. The depth of the threads shall be at least equal to 1½ times the diameter of the stud. Studded connections shall meet the requirements for reinforcement. No credit for reinforcement shall be allowed for any areas attached by studs only.

(c) Where pipes are screwed into the plating of the boiler, the minimum number of pipe threads permitted shall be in accordance with the following table:

TABLE 52.70–10 (c)—MINIMUM NUMBER OF PIPE THREADS FOR CONNECTIONS TO BOILER

Size of pipe connection, inches	1 and 1¼
Number of threads per inch	11½
Minimum number of threads required in opening	4
Minimum thickness of material required to give above number of threads (inches)	0.348

(d) The nearest steam stop valves and fittings attached to the boiler drum or superheater inlet shall have a pressure rating at least equal to the maximum set pressure of any safety valve on the boiler drum at the corresponding saturated steam temperature.

(e) The nearest steam stop valves and fittings attached to the superheater outlet shall have a pressure rating at least equal to the maximum set pressure of any safety valve on the superheater and at the normal operating superheated steam temperature. Where the superheater safety valve is of the drum pilot actuated type, the pressure rating shall be at least squal to 95 percent of the drum pilot safety valve setting at the normal operating steam temperature of the superheater outlet.

§ 52.70–25 Feed connections.

(a) Feed water shall not be discharged into a boiler against surfaces exposed to hot gases, to the radiant heat of the fire or close to a riveted joint.

(b) Feedwater nozzles of boilers with maximum allowable pressures of 400 pounds per square inch, or over, shall be fitted with sleeves or other suitable means employed to reduce the effects of metal temperature differentials.

§ 52.70–30 Blowoff connections.

(a) Boilers shall be fitted with a surface and a bottom blowoff valve or cock attached directly to the boiler or to a short distance piece. The surface blowoff valve shall be located within the permissible range of the water level, or fitted with a scum pan or pipe at this level. The bottom blowoff valve shall be attached to the lowest part of the boiler or fitted with an internal pipe leading to the lowest point inside the boiler. Water-tube boilers designed for pressures of 350 pounds per square inch or over are not required to be fitted with a surface blowoff valve. Boilers equipped with a continuous blowdown valve on the steam drum are not required to be fitted with an additional surface blowoff connection.

(b) Where blowoff pipes are exposed to radiant heat of the fire, they shall be protected by fire brick or other suitable heat-resisting material.

§ 52.70–35 Dry pipes.

Internal dry pipes may be fitted to stop valves and safety valves, provided such dry pipes have a wall thickness at least equal to standard commercial pipe thickness for their diameter. The area of the opening in such dry pipes shall be at least twice the nominal area of the dry pipe. Openings in dry pipes shall be as near as practicable to the valve and shall be slotted or drilled, the width of the slots to be not less than ¼ inch, or the diameter of the holes to be not less than ⅜ inch. Where dry pipes are used, they shall be provided with drains at each end to prevent an accumulation of water.

§ 52.70–40 Fusible plugs.

(a) All boilers, except water-tube boilers, and low-pressure heating boilers operating at pressures not in excess of 30 pounds per square inch, shall be fitted with fusible plugs manufactured from acceptable heats in accordance with Subpart 162.014 of Subchapter Q (Specifications) of this chapter.

(b) Vertical boilers shall be fitted with one fusible plug located in a tube not more than 2 inches below the lowest gauge cock.

(c) Externally fired, cylindrical boilers, with flues, shall have one plug fitted to the shell immediately below the fire line not less than 4 feet from the front end.

(d) Firebox, Scotch, and other types of shell boilers not specifically provided for, having a combustion chamber common to all furnaces, shall have one plug fitted at or near the center of the crown sheet of the combustion chamber.

(e) Double-ended boilers having individual combustion chambers for each end, which combustion chambers are common to all the furnaces in one end of the boiler, shall have one plug fitted at or near the center of the crown sheet of each combustion chamber.

(f) Boilers constructed with a separate combustion chamber for each individual furnace shall be fitted with a fusible plug in the center of the crown sheet of each combustion chamber.

(g) Boilers of types not herein provided for shall be fitted with at least one fusible plug of such dimensions and located in a part of the boiler as will, in the judgment of the inspector, best meet the purposes for which it is intended.

(h) Fusible plugs shall be so fitted that the smaller end of the filling is in direct contact with the radiant heat of the fire, and shall be at least 1 inch higher on the water side than the plate or flue in which they are fitted, and in no case more than 1 inch below the lowest permissible water level as defined in paragraph (i) of this section.

(i) The lowest permissible water level shall be determined as follows:

(1) Vertical fire-tube boilers, one-half of the length of the tubes above the lower tube sheets.

(2) Vertical submerged tube boiler, 1 inch above the upper tube sheet.

(3) Internally-fired fire-tube boilers with combustion chambers integral with the boiler, 2 inches above the highest part of the combustion chamber.

(4) Horizontal-return tubular and dry back Scotch boilers, 2 inches above the top row of tubes.

(5) The lowest permissible water level for all water-tube boilers shall be determined at the time drawings of the boilers are submitted for approval.

(j) (1) Fusible plugs shall be cleaned and will be examined by the marine inspector at each inspection for certification, and oftener, if necessary. If in the marine inspector's opinion the condition of any plug is satisfactory, it may be continued in use.

(2) When fusible plugs are renewed at other than the inspection for certification and no marine inspector is in attendance, the Chief Engineer shall submit a written report to the Officer in Charge, Marine Inspection, who issued the certificate of inspection informing him of the renewal. This letter report shall contain the following information:

(i) Name and official number of vessel.

(ii) Date of renewal of fusible plugs.

(iii) Number and location of fusible plugs renewed in each boiler.

(iv) Manufacturer and heat number of each plug.

(v) Reason for renewal.

(k) Fusible plugs shall not be permitted where the maximum steam temperature to which they are exposed exceeds 425° F.

§ 52.70–45 Pressure gauges.

(a) Each boiler shall have a steam gauge connected to the steam space or to the water column or its steam connection. The steam gauge shall be connected to a syphon or equivalent device of sufficient capacity to keep the gauge tube filled with water. Stop valves shall be provided at the connections to the boiler and at the gauge. Gauges shall be located where they can be easily seen.

(b) The gauge connections to the boiler, except the syphon, shall be not less than ¼ inch pipe size, but where ferrous pipe or tubing is used, they shall be not less than ½ inch inside diameter.

(c) The dial of the steam gauge shall be graduated to approximately double the pressure at which the safety valve is set, but in no case less than 1½ times this pressure.

(d) Each double-ended boiler shall be fitted with two steam gauges, one on either end of the boiler.

(e) The error in reading at any point on the gauge shall not exceed 1½ percent of the maximum reading to which the scale is graduated; except that the error in reading at the graduation indicating the steam pressure shall not exceed one-half of 1 percent of the maximum reading to which the scale is graduated.

§ 52.70–50 Water indicators.

(a) Each boiler shall have two independent means of indicating the water level in the boiler, one of which shall be a gauge glass. The secondary indicator may consist of a gauge glass, or other device approved by the Commandant, or where the maximum allowable pressure does not exceed 250 pounds per square inch, three test cocks attached directly to the head or shell of the boiler. Where the maximum allowable pressure exceeds 250 pounds per square inch, the gauge glasses shall be of the flat type instead of the common tubular type.

(b) Glass water gauges shall be so located that the lowest visible part of the glass is not lower than the lowest permissible water level, as determined by § 52.70–40 (l). The lowest gauge cock shall be located 2 inches higher than the lowest visible part of the gauge glass, except that for horizontal boilers 48 inches or less in diameter they may be located at the lowest permissible water level.

(c) Double-ended fire-tube boilers shall be equipped as specified in paragraphs (a) and (b) of this section, except that a water-gauge glass, and three water-gauge cocks shall be installed on each end of the boiler.

(d) Externally fired flue boilers, such as are used on central western river vessels, shall be equipped as specified in pargraphs (a) and (b) of this section, except that float gauges may be substituted for gauge glasses.

(e) Gauge glass connections, and pipe connections shall be not less than ½ inch pipe size. Each water-gauge glass shall be fitted with a globe or gate-valved drain piped to a safe discharge point. Water-gauge glasses shall be fitted with top and bottom shutoff valves of such through-flow construction as to prevent stoppage by deposits of sediments. Straight-run globe valves of the ordinary type so designed as to form pockets in which sediment may collect shall not be used on such connections.

(f) When water columns are provided they shall be fitted to the heads or shells of boilers or drums with shutoff valves attached directly to the boiler or drums, or if necessary, connected thereto by a distance piece both at the top and bottom of the water columns. Shutoff valves used in the pipe connections between the boiler and water column or between the boiler and the shutoff valves required by paragraph (e) of this section for gauge glasses, shall be locked or sealed open. Water column piping shall not be fitted inside the uptake, the smoke box, or the casing.

(g) No connections, except for regulators, drain, steam gauges, or appurtenances which do not permit the escape of an appreciable amount of steam or water therefrom, shall be placed on the pipes connecting a water column or gauge glass to a boiler.

§ 52.70–55 Salinometer cocks.

In vessels operating in salt water, each boiler shall be equipped with a salinometer cock or valve which shall be fitted directly to the boiler in a convenient position. They shall not be attached to the water gauge or water column.

PART 53—LOW-PRESSURE HEATING BOILERS

Subpart 53.01—General

Sec.
53.01–1 Scope.

Subpart 53.03—Steel Plate Heating Boilers

53.03–1 Scope.
53.03–5 Plan approval.
53.03–10 Materials.
53.03–15 Computations and design.
53.03–20 Braced and stayed surfaces.
53.03–25 Areas to be stayed.
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53.03–35 Boiler tubes.
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53.03–50 Boiler openings.
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53.03–63 Installation of safety and relief valves.
53.03–70 Fittings and appliances.
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Subpart 53.05—Cast-Iron Heating Boilers

53.05–1 Scope.
53.05–5 Plan approval.
53.05–10 Installation.
53.05–15 Safety and relief valves.
53.05–20 Fittings and appliances.

AUTHORITY: The provisions of this Part 53 issued under R.S. 4405, as amended, 4462, as amended; 46 U.S.C. 375, 416. Interpret or apply R.S. 4399, as amended, 4400, as amended, 4417, as amended, 4417a, as amended, 4418, as amended, 4421, as amended, 4426–4431, as amended, 4433, as amended, 4434, as amended, 4453, as amended, 4488, as amended, 4491, as amended, sec. 14, 29 Stat. 690, as amended, sec. 10, 35 Stat. 428, as amended, 41 Stat. 305, as amended, secs. 1, 2, 49 Stat. 1544, 1545, as amended, sec. 17, 54 Stat. 166, as amended, sec. 3, 54 Stat. 347, as amended, sec. 3, 70 Stat. 152, sec. 3, 68 Stat. 675; 46 U.S.C. 361, 362, 391, 391a, 392, 399, 404–409, 411, 412, 435, 481, 489, 366, 395, 363, 367, 526p, 1333, 390b, 50 U.S.C. 198; E.O. 11239, July 31, 1965, 30 F.R. 9671, 3 CFR, 1965 Supp. Treasury Department Orders 120, July 31, 1950, 15 F.R. 6521; 167–14, Nov. 26, 1954, 19 F.R. 8026; 167–20, June 18, 1956, 21 F.R. 4894; CGFR 56–28, July 24, 1956, 21 F.R. 5659; 167–38, Oct. 26, 1959, 24 F.R. 8857.

Subpart 53.01—General

§ 53.01–1 Scope.

(a) The regulations in this part apply to the design and construction of steel plate and cast iron steam and hot water boilers used for heating or hot water supply, the maximum allowable pressure of which shall not exceed the following:

(1) For steel plate boilers—30 pounds per square inch.

(2) For cast iron boilers—15 pounds per square inch for steam boilers and 30 pounds per square inch for hot water boilers.

(b) Except as otherwise provided for in this part, steel plate and cast iron steam and hot water heating boilers designed, fabricated and stamped in conformance with the requirements of the American Society of Mechanical Engineers Rules for Low-Pressure Heating Boilers (A. S. M. E. Boiler and Pressure Vessel Code Section IV) may be accepted for installation on vessels subject to inspection provided the maximum allowable pressure does not exceed 15 pounds per square inch for steam boilers and 30 pounds per square inch for hot water boilers.

(c) The maximum water temperature of hot water boilers shall not exceed 250° F.

(d) When operating conditions exceed those specified in paragraph (a) of this section, steel plate boilers shall be designed and fabricated in accordance with the requirements of Part 52 of this subchapter.

Subpart 53.03—Steel Plate Heating Boilers

§ 53.03–1 Scope.

(a) The regulations in this subpart contain detail requirements for the design and construction of steel plate heating boilers.

(b) A. S. M. E. steel plate heating boilers accepted under the provisions of § 53.01–1 need not comply with the applicable requirements of this subpart except that safety valves, relief valves, fittings and appliances shall meet the requirements prescribed therein.

(c) Steam heating boilers of steel plate construction, the maximum allowable pressure of which exceeds 15 pounds per square inch shall comply in all respects with the requirements of this subpart.

§ 53.03–5 Plan approval.

(a) Manufacturers of steel plate heating boilers of riveted or welded construction to be installed on vessels subject to inspection by the Coast Guard shall submit to the Commandant drawings in triplicate fully descriptive of the boilers to be fabricated.

(b) In event of approval of the boiler by the Commandant, it will be assigned a type approval number, which shall be stamped or otherwise permanently attached to each boiler in accordance with the provisions of § 53.03–75.

(c) The manufacturer shall also, upon request, furnish such additional drawings and specifications as may be necessary for the use of each Coast Guard District Commander and Officer in Charge, Marine Inspection. Unless the design or material of the boiler is changed, no further drawings will be required.

(d) A. S. M. E. steel plate heating boilers accepted under the provisions of § 53.01–1 are not subject to type approval by the Commandant and are exempt from the requirements of this section.

§ 53.03–10 Materials.

(a) The material used in the fabrication of steel plate heating boilers shall conform to the requirements of Parts 51 and 52 of this subchapter for power boilers except where otherwise provided for in this subpart.

(b) Plates used for pressure parts of boilers subject to the radiant heat of the fire shall be of firebox quality steel conforming to the requirements of subparts 51.04 or 51.22 of this subchapter.

§ 53.03–15 Computations and design.

(a) The design pressure of boilers covered by this subpart shall not be less than 30 pounds per square inch.

(b) The maximum allowable pressure and the minimum thickness of the cylindrical shell and dished heads of steel plate boilers shall be determined in accordance with the requirements of Subparts 52.05, 52.20 and 52.22 of this subchapter, except that the maximum allowable stress shall not exceed 80 percent of the values given in table 52.05–10 (a) in Part 52 of this subchapter.

(c) The minimum thickness of any boiler plate under pressure shall be ¼ inch for unstayed surfaces and $\frac{5}{16}$ inch for stayed surfaces and tube sheets.

§ 53.03–20 Braced and stayed surfaces.

(a) The design pressure, minimum thickness of material, and pitch of stays for stayed surfaces shall be determined in accordance with the requirements of Subpart 52.30 of this subchapter using coefficients as follows:

C=170 for plates exposed to the products of combustion and fitted with screw stays with riveted heads or welded collars.

C=190 for plates as above but not exposed to the products of combustion.

C=238 for plates exposed to the products of combustion fitted with screw stays with single nuts outside of plate and also for stays fitted with washers of twice the diameter of the stay. The thickness of the washers shall not be less than that of the plates through which the stays project and to which they are welded. Stays shall be supported at intervals not exceeding 6 feet.

C=274 for plates as above but not exposed to the products of combustion.

(b) The maximum distance from a corner welded joint to the nearest row of stay bolts shall not exceed one-half the maximum allowable pitch as determined by Subpart 52.30 of this subchapter.

(c) The diameter of a screw stay shall be taken at the bottom of the thread or point of least diameter. No screwed stay or stay attached by arc welding, shall be made of stock less than ¾ inch in diameter.

§ 53.03–25 Areas to be stayed.

(a) The area of a segment of a flanged head to be stayed shall be the area enclosed by the lines drawn 2 inches from the tubes and 3 inches from the shell. For unflanged heads the area to be stayed shall be the area enclosed by the shell and a line drawn 2 inches from the tubes.

(b) The staying of unflanged heads of welded boilers is not required if the greatest distance measured along a radial line from the inner surface of the shell to a fully supported line or point does not exceed 1¼ times the maximum allowable pitch of the stays as determined by Subpart 52.30 of this subchapter. For boilers fabricated with the heads set inside of the shell plates so that the distance from the end of the shell to the outside face of the head is at least 3 times the shell thickness, staying is not required if the greatest distance measured as above does not exceed 1½ times the maximum allowable pitch of the stays. For the purposes of applying this paragraph, a fully supported point is a stay rod or tube extending through the head and welded, having sufficient area to meet the requirements of table 53.03–30, and having area of weld in shear at least 1¼ times the required area of the stay member. A fully supported line is the tangent to a row of rolled or welded tubes or welded stays complying with the requirements of Subpart 52.30 of this subchapter or a bent or welded corner joint.

§ 53.03–30 Allowable stresses for stays or braces.

The maximum allowable stresses for stays, staybolts, or braces shall be in accordance with table 53.03–30.

TABLE 53.03–30—MAXIMUM ALLOWABLE STRESSES FOR STAYBOLTS AND STAYS OR BRACES

Description of staybolts and stays or braces	Stresses (pounds per square inch)	
	For lengths between supports not exceeding 120 diameters [1]	For lengths between supports exceeding 120 diameters [1]
(a) Unwelded or flexible staybolts less than 20 diameters [1] long, screwed through plates with ends riveted over, or such staybolts welded in by the arc welding process	7,500	----------
(b) Hollow steel staybolts less than 20 diameters [1] long, screwed through plates with ends riveted over, or such staybolts welded in by the arc welding process	8,000	----------
(c) Unwelded stays or braces and unwelded portions of welded stays or braces	9,500	8,500

[1] Diameters taken at body of stay or brace.

§ 53.03–35 Boiler tubes.

(a) The minimum thickness of copper tubes for heating boilers shall be determined by the following formula:

$$T=\frac{D}{45}+0.03 \qquad (1)$$

where:

T=thickness of tube wall, in inches.

D=outside diameter of tube, in inches.

(b) Copper tubes thinner than No. 16 B. W. G. shall not be used.

(c) The minimum thickness of steel or wrought iron tubes for heating boilers shall be in accordance with table 53.03–35 (c).

(d) Tubes may be attached to tube sheets by rolling and beading, or by welding.

(e) Where rolled and beaded tubes are not normal to the tube sheets, the plates shall have sufficient thickness to provide a parallel seating of not less than ¼ inch in depth between planes at right angles with the axis of the tubes.

TABLE 53.03–35 (c)—STEEL OR WROUGHT IRON TUBE FOR HEATING BOILERS

Diameter (inches)	Minimum thickness of tubes (inch)
1 or over but less than 2½	0.095
2½ or over but less than 3¼	.105
3¼ or over but less than 4	.120
4 or over but less than 5	.135

§ 53.03–40 Riveted boilers.

Riveted joints of heating boilers shall conform to the requirements of Subpart 52.10 of this subchapter as specified for power boilers.

§ 53.03–45 Welded boilers.

(a) The design and construction of welded heating boilers shall conform to the applicable requirements prescribed in Part 56 of this subchapter for power boilers, except as specified in this subpart.

(b) Radiographic examination and stress relieving of welded joints are not required.

(c) Welded longitudinal shell joints shall be of the double welded butt type or of the single welded butt type fitted with a backing strip.

(d) The circumferential welded shell joints may be of the single or double welded butt type.

(e) Unstayed dished heads, either concave or convex to the pressure, with or without flanges, may be used, provided the diameter of the heads does not exceed 42 inches and the radius of the dish does not exceed 75 inches. For diameters exceeding 42 inches, dished heads shall have flanges not less than 1 inch in length, and shall meet the requirements for power boilers.

(f) Where stays or tubes are welded to plates which require staying, the attachment shall meet the following requirements:

(1) The stays shall be inserted into holes through the tube sheets and attached thereto by strength fillet welds. The size of the fillet weld attaching the stay to the plate shall be not less than the thickness of the plate being stayed, except for plates thicker than ⅜ inch, in which case the size of the fillet weld shall be ⅜ inch. The holes in the plate shall be countersunk or beveled by machining or pressing, or the stays may protrude through the plates or a combination of these methods may be used. The area of the weld, in shear, measured parallel to that portion of the stay in or extending through the plate shall be not less than 1¼ times the required cross-sectional area of the stay.

(2) The ends of stays inserted through plates shall not project more than ⅜ inch beyond surfaces exposed to the products of combustion.

(3) The welding shall be done in such manner that excessive weld deposits do not project beyond the surface of the plate at the root of the weld.

(g) Welded joints attaching unflanged heads, tube sheets, sides, or combustion chamber plates shall be of the single or double welded butt type where possible. Other acceptable types of attachments are the square tee double fillet welded joint and single or double bevel grooved joints.

(h) Unflanged plates of welded joints shall be beveled not less than 45° to permit complete penetration of the weld metal and shall have a fillet reinforcement whose throat dimension shall not be less than one and one-fourth times the thickness of the shell or head, whichever is the least.

§ 53.03–50 Boiler openings.

(a) Boilers shall be provided with suitable manhole or handhole openings or washout plug openings to permit internal inspection and removal of sediment. Where the size of the boiler is such that entrance is impractical manhole openings may be omitted.

(b) A manhole shall be placed in the front head below the tubes of a horizontal return tubular boiler 48 inches or over in diameter. There shall be a manhole in the upper part of shell or head of a fire-tube boiler over 48 inches in diameter, except a vertical fire-tube boiler, or a boiler used exclusively for hot-water heating where there is no steam space.

(c) Vertical fire-tube or similar type boilers shall have at least 3 handholes or washout plugs in the lower part of the water leg and at least 2 handholes or washout plugs near the line of the lower tube sheet.

(d) A fire door or other access opening not less than 11 by 15 inches or 10 by 16 inches or 15 inches in diameter shall be provided for the furnace of an internally fired boiler in which the least furnace dimension is 28 inches or over.

(e) Washout plugs shall be made of nonferrous material and be of not less than 2 inches pipe size.

(f) Washout openings may be used for return pipe connections and the washout plug placed in a tee so that the plug is directly opposite and as close as possible to the opening in the boiler.

(g) All threaded openings shall be tapped into material having a minimum thickness as specified for the various pipe sizes in table 53.03–50 (g).

TABLE 53.03–50 (g)—MINIMUM THICKNESS OF MATERIAL FOR THREADED CONNECTIONS

Pipe size (inches)	Minimum thickness of material or length of thread required (inch)
1 and under	¼
1¼ to 2, inclusive	5/16
2½	3/8
3 to 3½, inclusive	½

(h) Flanged pipe connections to boilers shall conform to the standards given in table 55.07–15 (e1) of Part 55 of this subchapter for the corresponding pipe sizes.

§ 53.03–55 Installation.

(a) Feed or makeup water shall not be discharged directly into any part of a boiler exposed to the radiant heat of the fire. Feed water shall not be introduced through the openings or connections used for the water column, the water gauge, or the gauge cocks.

(b) Hot water systems shall be so installed that there will be no opportunity for the fluid-relief column to be accidentally shut off.

(c) When a stop valve is used in the supply pipe connection of a single boiler, there shall be one used in the return pipe connection.

(d) A stop valve shall be used in each supply and return pipe connection if more than one boiler is connected to a common system.

(e) Provision shall be made for cleaning the interior of the return piping at or close to the boiler.

(f) When stop valves are used they shall be properly designated on tags of metal or other durable material as indicated by the following:

> Supply valve—Number ( ). Do not close without also closing return valve—Number ( ).

> Return valve—Number ( ). Do not close without also closing supply valve—Number ( ).

§ 53.03–60 Safety valves.

(a) Each steam heating boiler shall have one or more approved safety valves set to discharge at a pressure of not to exceed 30 p. s. i., and designed, constructed and flow-tested for actual capacity in conformance with Subpart 162.012 of Subchapter Q (Specifications) of this chapter.

(b) The minimum safety valve capacity in pounds per hour shall be determined by dividing the maximum B. t. u. output at the boiler nozzle obtained by the firing of any fuel, for which the unit is designed, by 1,000 or by multiplying the square feet of heating surface by 5. In many cases a greater relieving capacity of valves will have to be provided than the minimum specified by these regulations. In all cases the requirements of paragraph (c) of this section shall be met.

(c) The steam safety valve capacity for each boiler shall be such that with the fuel-burning equipment installed, the pressure cannot rise more than 6 percent above the maximum allowable pressure of the boiler. For set pressures not exceeding 15 p. s. i., the safety valve capacity may be such that with the fuel-burning equipment installed, the pressure cannot rise more than 5 pounds above the maximum allowable pressure.

(d) When operating conditions are changed, or additional boiler heating surface is installed, the safety valve capacity shall be increased, if necessary, to meet the new conditions and be in accordance with paragraph (c) of this section. The additional safety valves may be installed on the outlet piping provided there is no intervening valve.

§ 53.03–62 Relief valves.

(a) Each hot-water heating or hot-water supply boiler shall have one or more approved relief valves set to relieve at a pressure not to exceed 30 p. s. i., and designed, constructed and flow-tested for actual capacity in conformance with Subpart 162.013 of Subchapter Q (Specifications) of this chapter.

(b) The steam relieving capacity in pounds per hour shall be determined by dividing the maximum B. t. u. output at the boiler nozzle obtained by the firing of any fuel, for which the unit is designed, by 1,000 or by multiplying the square feet of heating surface by 5. In many cases a greater relieving capacity of valves will have to be provided than that minimum specified by the regulations in this subpart. In every case, the requirements of paragraph (c) of this section shall be met.

(c) The relief valve capacity for each boiler shall be such that with any fuel burning equipment installed the pressure cannot rise more than 3 pounds per square inch above the maximum allowable pressure of the boiler.

§ 53.03–63 Installation of safety and relief valves.

(a) Safety and relief valves shall be installed with the spindle vertical, if possible, and may be connected directly to the boiler, or to a fitting connected to the boiler by a close nipple, or to a Y base or valveless steam or water pipe between adjacent boilers, or to a valveless header connecting steam or water outlets in the same boiler. Safety and relief valves shall not be connected to an internal pipe in the boiler.

(b) When a Y base is used the inlet area shall be not less than the combined outlet areas.

(c) When the size of the boiler requires a safety or relief valve larger than 4 inches in diameter, two or more valves having the required combined capacity shall be used. When two or more valves are used on a boiler, they may be single, directly attached, or mounted on a Y base.

(d) No shutoff of any description shall be placed between the safety or relief valve and the boiler, nor on discharge pipes between such valves and the atmosphere.

(e) The escape from safety or relief valves shall be fitted with discharge piping so arranged that there is no danger of scalding operating personnel.

(f) The area of the discharge pipe shall be not less than the area of the valve or aggregate area based on the nominal diameters of the valves with which it connects. The discharge pipe shall be fitted with an open drain to prevent water from lodging in the upper

part of the valve or in the pipe. When an elbow is placed on a safety- or relief-valve discharge pipe, it shall be located close to the valve outlet.

§ 53.03–70 Fittings and appliances.

(a) *Steam gauges.* (1) Each steam boiler shall have a steam gauge connected to its steam space, or to its water column, or to its steam connection by means of a siphon or equivalent device exterior to the boiler and of sufficient capacity to keep the gauge tube filled with water and so arranged that the gauge cannot be shut off from the boiler except by a cock, with T or lever handle, placed in the pipe near the gauge. The handle of the cock shall be parallel to the pipe on which it is located when the cock is open.

(2) Connections to steam gauge siphon shall be of nonferrous metal when smaller than 1 inch pipe and longer than 5 feet between the siphon and point of connection of pipe to boiler, and also when smaller than ½ inch pipe size and shorter than 5 feet between the siphon and point of connection of pipe to boiler.

(3) The scale on the dial of the gauge shall be graduated to not less than 30 p. s. i. The gauge shall be provided with effective stops for indicating pointer at the zero point. The travel of the pointer from zero to 30 p. s. i. shall be at least 3 inches.

(b) *Water pressure gauges.* (1) Each hot water boiler shall have a pressure gauge connected to it or to its flow connection in such a manner, that it cannot be shut off from the boiler except by a cock, with T or lever handle, placed on the pipe near the gauge. The handle of the cock shall be parallel to the pipe on which it is located when the cock is open.

(2) Pressure gauge connections shall be of nonferrous material when smaller than 1 inch pipe size and longer than 5 feet between gauge and point of connection of pipe to boiler, and also when smaller than ½ inch pipe size and shorter than 5 feet between gauge and point of connection of pipe to boiler.

(c) *Thermometers.* (1) Each hot-water boiler shall have a thermometer so located and connected that the temperature may be read at the same time as the water pressure is being observed.

(2) The thermometer shall be so located that it shall at all times indicate the temperature in degrees Fahrenheit of the water in the boiler or near the outlet.

(d) *Temperature combustion regulator.* A temperature combustion regulator, which will control the rate of combustion to prevent the temperature of the water from rising above 250° F. at or near the outlet, or a thermostatic device which will relieve the pressure on the boiler when the temperature exceeds 250° F. shall be installed on each hot water heating boiler.

(e) *Pressure control regulator.* When a pressure control regulator is used, it shall operate and prevent the steam pressure from rising above 30 p. s. i.

(f) *Bottom blowoff.* Each boiler shall have a blowoff pipe connection fitted with a valve or cock of not less than ¾ inch pipe size connected to the lowest water space available.

(g) *Water gauge glasses.* Each steam boiler shall have one or more water gauge glasses attached to the water column or boiler by means of valved fittings with the lower fitting provided with a valve or pet cock.

(h) *Gauge cocks.* Each steam boiler shall have two or more gauge cocks located within the visible range of the water glass.

(i) *Water column pipes.* The minimum size of pipes connecting a water column to a steam boiler shall be 1 inch. No connections, except for regulator, drain or steam gauge, shall be attached to a water column or the piping connecting a water column to a boiler. If the water column or gauge glass is connected to the boiler by pipe and fittings, a T, or equivalent fitting, in which a drain valve and piping may be attached, shall be installed in the water piping connection at every right angle turn to facilitate cleaning.

(j) *Automatic low-water fuel cutoff.* (1) Each automatically-fired steam boiler shall be equipped with an automatic low-water fuel cutoff, so located as to automatically cut off the fuel supply when the surface of the water falls below the lowest safe water level. If a water-feeding device is installed in conjunction with the required low-water fuel cutoff, it shall be so constructed that the water inlet valve cannot feed water into the boiler through the float chamber and so located as to supply the required amount of feed-water when the surface of the water falls to the lowest safe water level. This point shall be not lower than the lowest visible part of the water glass.

(2) The fuel or feed-water control device may be attached direct to the boiler or to the tapped openings provided for attaching a water glass direct to a boiler, provided that such connections from the boiler are non-ferrous T's or Y's not less than ½-inch pipe size between the boiler and the water glass, so that the water glass is attached direct and as close as possible to the boiler. The straightway tapping of the Y or T shall take the water glass fitting, and the side outlet of the Y or T shall take the fuel cutoff or water-feeding device.

(3) Low water cutoff devices employing a float and float bowl shall have a vertical straightaway valved drain pipe at the lowest point in the water equalizing pipe connection by which the bowl and equalizing pipe can be flushed and the device tested.

§ 53.03–75 Hydrostatic tests, inspection, and stamping.

(a) Each boiler shall be subjected to a hydrostatic test pressure of not less than 60 pounds per square inch by the manufacturer.

(b) Shop inspection of A. S. M. E. approved heating boilers by a Coast Guard inspector is not required.

(c) Except as provided for in paragraph (b) of this section, heating boilers of steel plate construction, the maximum allowable pressure of which exceeds 15 p. s. i., shall be examined in the manufacturer's shop by an inspector while the boiler is subjected to the required hydrostatic test pressure. The inspector shall ascertain that there are no defects in workmanship and materials and that no defects have occurred due to the hydrostatic test.

(d) Steel plate heating boilers of the automatically controlled package type shall be subjected to such operating tests as may be prescribed by the Commandant.

(e) Upon completion of the hydrostatic test and inspection of heating boilers subject to shop inspection, and after such boilers are found acceptable, they shall be stamped in a suitable location so as to be readily visible, with the following data:

(Name of fabricator and serial number)

(Month and year fabricated)
---- P. s. i.
(Maximum allowable pressure) (Steam)
---- Pounds per hour
(Safety valve capacity, minimum)
Coast Guard approval No. and symbol ----
Inspector's initials ----

(f) After installation, each heating boiler shall be hydrostatically tested to twice the pressure at which the safety or relief valve is set to open.

Subpart 53.05—Cast-Iron Heating Boilers

§ 53.05–1 Scope.

(a) The regulations in this subpart contain requirements for the design and construction of cast iron heating boilers.

(b) A. S. M. E. cast iron heating boilers accepted under the provisions of § 53.01–1 shall comply with the applicable requirements for safety valves, relief valves, fittings and appliances prescribed in this part.

§ 53.05–5 Plan approval.

A.S.M.E. cast iron heating boilers accepted under the provisions of § 53.01–1 are not subject to type approval by the Commandant and are exempt from the requirements of this section.

§ 53.05–10 Installation.

The provisions of § 53.03–55 shall apply to cast iron boilers.

§ 53.05–15 Safety and relief valves.

(a) The provisions of §§ 53.03–60, 53.03–62 and 53.03–63 shall apply to cast iron heating boilers except as specified in this section.

(b) Safety valves shall be set to discharge at a pressure not to exceed 15 pounds per square inch and relief valves shall be set to discharge at a pressure not to exceed 30 pounds per square inch.

(c) Safety and relief valves for cast iron heating boilers shall be such that with any fuel burning equipment installed, the pressure cannot rise above the maximum allowable pressure more than 5 pounds per square inch for a steam boiler and three pounds per square inch for a hot water boiler.

§ 53.05–20 Fittings and appliances.

The provisions of § 53.03–70 shall apply to fittings and appliances for cast iron boilers, except that the pressure control regulator shall operate to prevent the steam pressure from rising above 15 pounds per square inch.

PART 54—UNFIRED PRESSURE VESSELS

Subpart 54.01—General Requirements

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54.01–1 Scope.
54.01–5 Definitions.
54.01–10 Plan approval.

Subpart 54.03—Design and Construction

54.03–1 Materials.
54.03–5 Workmanship and design.
54.03–10 Cylindrical shells and heads.
54.03–12 Cast-iron heads.
54.03–15 Tube sheets.
54.03–20 Heat exchanger tubes.
54.03–25 Bolted flanged connections.
54.03–27 Unfired steam boilers.
54.03–30 Evaporators.
54.03–35 Access and inspection openings.
54.03–40 Openings and reinforcements.

Subpart 54.07—Pressure-Relief Devices

54.07–1 General requirements.
54.07–5 Relief valves.
54.07–10 Safety valves.
54.07–15 Heat exchanger relief valves.
54.07–20 Rupture disks.
54.07–25 Safety relief valves.

AUTHORITY: The provisions of this Part 54 issued under R.S. 4405, as amended, 4462, as amended; 46 U.S.C. 375, 416. Interpret or apply R.S. 4399, as amended, 4400, as amended, 4417, as amended, 4417a, as amended, 4418, as amended, 4421, as amended, 4426–4431, as amended, 4433, as amended, 4434, as amended, 4453, as amended, 4488, as amended, 4491, as amended, sec. 14, 29 Stat. 690, as amended, sec. 10, 35 Stat. 428, as amended, 41 Stat. 305, as amended, secs. 1, 2, 49 Stat. 1544, 1545, as amended, sec. 17, 54 Stat. 166, as amended, sec. 3, 54 Stat. 347, as amended, sec. 3, 70 Stat. 152, sec. 3, 68 Stat. 675; 46 U.S.C. 361, 362, 391, 391a, 392, 399, 404–409, 411, 412, 435, 481, 489, 366, 395, 363, 367, 526p, 1333, 390b, 50 U.S.C. 198; E.O. 11239, July 31, 1965, 30 F.R. 9671, 3 CFR, 1965, Supp. Treasury Department Orders 120, July 31, 1950, 15 F.R. 6521; 167–14, Nov. 26, 1954, 19 F.R. 8026; 167–20, June 18, 1956, 21 F.R. 4894; CGFR 56–29, July 24, 1956, 21 F.R. 5659; 167–38, Oct. 26, 1959, 24 F.R. 8857, unless otherwise noted.

Subpart 54.01—General Requirements

§ 54.01–1 Scope.

(a) The regulations in this part contain detail requirements for the design and construction of unfired pressure vessels subject to inspection by the Coast Guard.

(b) The following classes of unfired pressure vessels are not subject to plan approval or shop inspection by the Coast Guard and are exempt from the requirements of this part:

(1) All unfired pressure vessels designed for a maximum allowable pressure not exceeding 15 pounds per square inch.

(2) Compression tanks containing water under pressures not exceeding 100 pounds per square inch and temperatures not exceeding 200 degrees F. Compression tanks containing water and fitted with a permanent air charging line subject to pressures not exceeding 15 pounds per square inch and temperatures not exceeding 200 degrees F.

(3) Condensers, jacket water coolers and lubricating oil coolers containing mediums at or below the pressures and temperatures specified in Table 54.01–1 (c).

(c) Unfired pressure vessels,[1] exclusive of those covered by paragraph (b) of this section, designed for a maximum allowable pressure exceeding 15 pounds per square inch shall comply with the requirements for materials, construction, welding, inspection and marking as specified in this subchapter, except such vessels may be exempt from shop inspection under any of the following conditions:

(1) When the internal volume does not exceed 5 cubic feet and the maximum allowable pressure does not exceed 100 p. s. i.

(2) When a pressure vessel contains mediums at or below pressures and temperatures specified in Table 54.01–1 (c).

TABLE 54.01–1 (c)—EXEMPTION OF UNFIRED PRESSURE VESSELS FROM SHOP INSPECTION

Service	Pressure—p. s. i.	Temperature, °F.
Steam, gas or vapors	15	----------
Fuel oil	100	150
Lubricating oil	100	200
Liquids, except fuel oil and lubricating oil.	100	200

(d) Unfired pressure vessels containing dangerous articles, substances or combustible liquids which are required by law or regulation to be carried in containers fabricated as a pressure vessel shall comply with the requirements for materials, construction, welding, inspection and marking as specified in this chapter, irrespective of pressure, temperature or capacity, except vessels containing such dangerous articles which are permitted by Subchapter N (Dangerous Cargoes) of this chapter, to be carried in containers constructed in accordance with the requirements of the Interstate Commerce Commission.

(e) Small unfired pressure vessels which do not fully comply with the requirements of this subchapter may be accepted by the Commandant for installation on vessels subject to inspection by the U. S. Coast Guard, provided:

(1) The failure of such unfired pressure vessels will not endanger the safety of the vessel.

(2) The internal volume does not exceed 5 cubic feet.

(3) The construction complies with the requirements of a recognized code, or tests as prescribed by the Commandant are carried out to prove that the design and fabrication are suitable for the intended application.

(4) Such unfired pressure vessels shall otherwise comply with the requirements for plan approval and marking as specified in this subchapter.

(f) Unfired pressure vessels, other than those containing compressed air, which do not fully comply with the requirements of this subchapter may be accepted for installation on vessels subject to inspection, provided:

(1) They are used exclusively in the handling and storage of petroleum and associated products obtained in offshore drilling operations.

(2) The design, fabrication, and stamping comply with the requirements of the API-ASME or ASME Code for Unfired Pressure Vessels.

§ 54.01–5 Definitions.

(a) *Unfired pressure vessel.* An unfired pressure vessel is a tank containing gas, vapor, or liquid, or a combination thereof, under pressure, and not exposed to the products of combustion.

(b) *Heat exchanger.* A heat exchanger is a device usually consisting of a shell and tubes or coils by which heat is transferred from one substance to another.

§ 54.01–10 Plan approval.

Manufacturers intending to fabricate unfired pressure vessels, heat exchangers, evaporators and similar appurtenances covered by the regulations in this part, to be installed on vessels subject to inspection by the Coast Guard, shall submit to the Officer in Charge, Marine Inspection, having jurisdiction over the vessel, detail plans in triplicate, which shall be fully descriptive of the pressure parts of such unfired pressure vessels. When due to location of the fabrication shop, such procedure would result in unnecessary delay in transmission, the plans may be forwarded directly to the Commandant (MMT) U. S. Coast Guard, Washington, D.C., 20226.

[1] The shell, tubes or coils of a heat exchanger shall be considered an unfired pressure vessel if such parts may be subjected to steam, gas or vapor pressures exceeding 15 pounds per square inch.

Subpart 54.03—Design and Construction

§ 54.03–1 Materials.

(a) Unfired pressure vessels and appurtenances covered by this part may be fabricated of material conforming to the specifications given in Part 51 of this subchapter and limited to the grades of material listed in table 52.05–10(a) in Part 52 of this subchapter and table 54.03–10(c) except as otherwise provided for in this part.

(b) Steel plate used for pressure parts of unfired pressure vessels may be of Class B material complying with the requirements of Subpart 51.04, 51.22 or 51.23 in Part 51 of this subchapter, except that in the case of unfired pressure vessels having maximum allowable pressures exceeding 700 pounds per square inch or temperatures exceeding 650° F. steel plate shall be of Class A material meeting the requirements of Subpart 51.04 in Part 51 of this subchapter.

(c)(1) Arc- or gas-welded pressure vessels over one inch in thickness, when constructed of steel plate complying with Subpart 51.04 of this subchapter conforming to specifications A202, A203, A204, A212, A225, A299, A302, and A387, Grade A, B, or C, shall conform to the requirements for Class I welded pressure vessels.

(2) Where vessels are constructed of steel plate, conforming to specifications A202, A203, A204, A212, A225, A299, A302, and A387, Grade A, B, or C, which do not exceed one inch in thickness, the requirements for Class II welded pressure vessels shall apply and the vessels shall be stress-relieved as required by § 56.01–70(h) of this subchapter.

(3) Arc- or gas-welded pressure vessels, when constructed of steel plate conforming to specifications A357, A387, Grades D and E, and A410, shall conform to the requirements for Class I pressure vessels.

(d) Carbon- and alloy-steel castings shall comply with the grades of material listed in table 52.05–10 (a) in Part 52 of this subchapter. The casting quality factor specified in § 52.05–13 of this subchapter shall be applied to the stresses given in table 52.05–10 (a).

(e) For electric resistance-welded pipe or tubing the stress values in table 52.05–10 (a) in Part 52 of this subchapter shall be substituted in the applicable design formulas for the factor SE.

(f) Unfired pressure vessels may be constructed of cast iron conforming to the applicable specifications of Part 51 of this subchapter under the following conditions:

(1) Cast iron shall not be used in the construction of shells and heads of pressure vessels where subject to steam pressures exceeding 30 pounds per square inch or where subject to gas or liquid pressures exceeding 125 pounds per square inch.

(2) The maximum allowable stress for cast iron as given in table 54.03–1 (f) shall be used in the applicable formula for unfired pressure vessels.

TABLE 54.03–1(f)—MAXIMUM ALLOWABLE STRESS FOR CAST IRON

Minimum tensile strength, p. s. i.:	*Maximum tensile stress, p. s. i.*
20,000	2,000
25,000	2,500
30,000	3,000
35,000	3,500
40,000	4,000
50,000	5,000

(g) Nonferrous materials may be used in the construction of unfired pressure vessels subject to the following conditions:

(1) The grade of materials shall be as specified in Part 51 of this subchapter, and as given in Table 54.03–10(c).

(2) The pressure and temperature limitations for bronze castings shall be as given in § 55.07–1(d) of this subchapter.

(3) Welding may be employed for aluminum alloy grades 6061–T6 and 6063–T6, provided welding procedure qualification tests are conducted in accordance with § 56.01–15 of this subchapter.

§ 54.03–5 Workmanship and design.

(a) Equipment covered by this part and constructed of plates with riveted or welded joints shall conform to all the requirements of Part 52 of this subchapter for such construction, except as provided otherwise in this part.

(b) Flanges cast integral with shells or heads shall have a fillet radius not less than the thickness of the necks to which they are attached.

(c) The corner radius of a cast unstayed dished head measured on the concave side of the head shall be not less than three times the thickness of the head, but in no case less than 6 percent of the outside diameter of the shell.

§ 54.03–10 Cylindrical shells and heads.

(a) The maximum allowable pressure of cylindrical shells and heads of unfired pressure vessels under internal pressure shall be determined by the applicable formulas given in Part 52 of this subchapter, except as provided otherwise in this part. The maximum allowable pressure of cylindrical shells shall be determined from Formula (1) of § 52.05–10 of this subchapter when the thickness does not exceed one-half of the inside radius, or the maximum allowable pressure does not exceed 0.385 SE. When the thickness of the shell exceeds one-half of the inside radius or when the maximum allowable pressure exceeds 0.385 SE, Formula (2) of § 52.05–10 of this subchapter shall be used.

(b) The minimum thickness of shell plates, heads or dome plates of seamless or welded construction shall be $\frac{3}{32}$ inch after forming and without allowances for corrosion. The minimum thickness, after forming, of any plate in a riveted pressure vessel shall be $\frac{7}{16}$ inch without corrosion allowance.

(c) The maximum allowable stresses for nonferrous materials shall be as given in table 54.03–10(c).

TABLE 54.03–10(c)—MAXIMUM ALLOWABLE STRESSES [1] FOR NONFERROUS MATERIALS

Specification	A.S.T.M. designation	Grade		Minimum tensile strength p.s.i.	Minimum yield strength p.s.i.	Notes	For metal temperatures not exceeding ° F.											
		A.S.T.M.	C.G.				100	150	200	250	300	350	400 [2]	450	500	550	600	650/700
Aluminum-alloy plates and sheets																		
51.79	B–209	1060	1060–0	9,500	2,500	(3)	1,650	1,650	1,600	1,450	1,250	1,200	1,050					
51.79	B–209	1100	1100–0	11,000	3,500	(3)	2,350	2,350	2,300	2,100	1,850	1,600	1,300					
51.79	B–209	3003	3003–0	14,000	5,000	(3)	3,350	3,150	2,900	2,700	2,400	2,100	1,800					
51.79	B–209	3004	3004–0	22,000	8,500	(3)	5,500	5,500	5,500	5,200	4,500	3,600	2,950					
51.79	B–209	5050	5050–0	18,000	6,000	(3)	4,000	4,000	4,000	4,000	4,000	3,350	2,100					
51.79	B–209	5052	5052–0	25,000	9,500	(3)	6,250	6,250	6,200	6,000	5,400	4,650	3,500					
51.79	B–209	5083	5083–0	40,000	18,000	(4)	10,000	10,000										
51.79	B–209	5086	5086–0	35,000	14,000		8,700	8,700										
51.79	B–209	5154	5154–0	30,000	11,000	(3)	7,350	7,350	7,350	7,000	6,400							
51.79	B–209	5456	5456–0	42,000	19,000		10,500	10,400										
51.79	B–209	6061–T6W	6061–T6W	[5] 24,000			6,000	5,900	5,700	5,400	5,000	4,200	3,200					

See footnotes at end of table.

TABLE 54.03-10(c)—MAXIMUM ALLOWABLE STRESSES[1] FOR NONFERROUS MATERIALS—Continued

Specification	A.S.T.M. designation	Grade		Minimum tensile strength p.s.i.	Minimum yield strength p.s.i.	Notes	For metal temperatures not exceeding ° F.											
		A.S.T.M.	C.G.				100	150	200	250	300	350	400[2]	450	500	550	600	650/700
Copper and copper-alloy plates																		
51.67	B-11	Copper	B11-1, -2, -3, -4.	30,000	10,000	(9)	6,700	6,700	6,500	6,300	5,000	3,800	2,500					
51.67	B-96	Copper-silicon	B96-A or -C	50,000	18,000	(9)	12,000	12,000	11,900	11,700								
51.67	B-171	Naval brass	B171-A	50,000	20,000	(7)	12,500	12,500	12,000	11,200	10,500	7,500	2,000					
51.67	B-171	Admiralty metal.	B171-B	45,000	15,000	(7)	10,000	10,000	10,000	10,000	10,000	8,000	5,000	3,000				
51.67	B-171	Copper nickel 70-30.	B171-C	50,000	20,000	(7 9)	12,500	12,200	11,900	11,600	11,300	11,000	10,800	10,600	10,400	10,200	10,000	9,800/9,700
51.67	B-171	Copper nickel 90-10.	B171-D	40,000	15,000	(7 9)	10,000	10,000	9,800	9,500	9,300	9,000	8,700	8,300	8,000	7,600	6,000	
51.67	B-402	Copper nickel 70-30.	B-402-A	45,000	18,000		11,200	10,800	10,500	10,200	9,900	9,700	9,500	9,400	9,300	9,200	9,100	9,000/8,900
51.67	B-402	Copper nickel 90-10.	B-402-B	38,000	15,000		9,500	9,500	9,300	9,000	8,800	8,500	8,200	7,900	7,600	6,600	5,700	
51.67	B-169	Aluminum bronze alloy D.	B169-D	70,000	30,000	(7)	17,500	17,500	16,800	16,000	15,500	15,000	14,500	12,000	10,000			
51.67	B-171	Aluminum bronze alloy D.	B171-E	70,000	30,000	(4 7)	17,500	17,500	16,800	16,000	15,500	15,000	14,500	12,000	10,000			
51.67	B-171	Aluminum bronze alloy E.	B171-E, -F	90,000	36,000	(4 7)	22,500	22,500	21,000	19,500	18,000	16,500	15,000	13,500	12,000	10,500	9,000	7,500/6,000
Seamless pipe or tubes																		
51.80	B-210	1060	1060-0	9,500	2,500	(3 9)	1,650	1,650	1,600	1,450	1,250	1,200	1,050					
51.80	B-235																	
51.80	B-210	3003	3003-0	14,000	5,000	(9)	3,500	3,150	2,900	2,700	2,400	2,100	1,800					
51.80	B-235																	
51.80	B-210	5154	5154-0	30,000	11,000	(9)	7,350	7,350	7,350	7,000	6,400							
51.80	B-235																	
51.80	B-235	5456	5456-0	42,000	19,000		10,500	10,400										
51.80	B-241																	
51.80	B-210	6063-T6W	6063-T6W	4 17,000			4,250	4,200	4,000	3,800	3,600	2,750	1,900					
51.80	B-235																	
51.80	B-241																	
51.80	B-210	6061-T6W	6061-T6W	4 24,000			6,000	5,900	5,700	5,400	5,000	4,200	3,200					
51.80	B-234																	
51.80	B-235																	
51.80	B-241																	
51.70	B-42	Copper pipe	B42	30,000	9,000	(3 10)	6,000	6,000	5,900	5,800	5,000	3,800	2,500					
51.70	B-42	Copper pipe (2.00" and under).	B42	45,000	40,000	(3 10 11)	11,300	11,300	11,000	10,500	8,000	5,000	2,500					
51.70	B-42	Copper pipe (above 2.00").	B42	36,000	30,000	(3 11 11)	9,000	9,000	8,700	8,300	8,000	5,000	2,500					
51.70	B-43	Red brass pipe	B43	40,000	12,000	(3 10)	8,000	8,000	8,000	8,000	8,000	6,000	3,000	2,000				
51.73	B-75	Copper tubes	B75-A or -B	30,000	9,000	(3 10)	6,000	6,000	5,900	5,800	5,000	3,800	2,500					
51.73	B-75	Copper tubes	B75-A or -B	36,000	30,000	(3 11)	9,000	9,000	8,700	8,300	8,000	5,000	2,500					
51.73	B-88	Copper tubes	B88-K, -L or -M.	30,000	10,000	(9)	6,700	6,700	6,500	6,300	5,000	3,800	2,500					
51.73	B-88	Copper tubes	B88-K, -L or -M.	36,000	30,000	(3 11)	9,000	9,000	8,700	8,300	8,000	5,000	2,500					
51.73	B-111	Copper tubes	B111-A or-B	30,000	10,000	(3 10)	6,700	6,700	6,500	6,300	5,000	3,800	2,500					
51.73	B-111	Copper tubes	B111-A or-B	36,000	30,000	(3 10 11)	9,000	9,000	8,700	8,300	8,000	5,000	2,500					
51.73	B-111	Red brass tubes	B111-C	40,000	12,000	(3 10)	8,000	8,000	8,000	8,000	8,000	6,000	3,000	2,000				
51.73	B-111	Admiralty metal.	B111-D	45,000	15,000	(3 10)	10,000	10,000	10,000	10,000	10,000	8,000	5,000	3,000				
51.73	B-111	Aluminum brass tubes.	B111-E	50,000	18,000	(3 10)	12,000	12,000	12,000	12,000	12,000	7,500	3,000	2,000				
51.73	B-111	Copper nickel tubes 70-30.	B111-G	52,000	18,000	(3 10)	12,000	11,600	11,300	11,000	910,800	10,600	10,300	10,100	9,900	9,800	9,600	9,500/9,400
51.73	B-111	Copper nickel tubes 80-20.	B111-H	45,000	16,000	(3 10)	10,700	10,600	10,500	10,400	10,300	10,100	9,900	9,600	9,300	8,900	8,400	7,700/7,000
51.73	B-111	Copper nickel tubes 90-10.	B111-I	40,000	15,000	(3 10)	10,000	10,000	9,800	9,500	9,300	9,000	8,700	8,300	7,500	6,700	6,000	
51.73	B-111	Aluminum bronze tubes.	B111-F	50,000	19,000	(3 10)	12,500	12,400	12,200	11,900	11,600	10,000	6,000	4,000	2,000			
Brazed pipe		Copper					3,000	3,000	3,000	3,000	12 2,600							
Bars, rods, shapes and forgings																		
51.81	B-247	3003F	3003F	14,000	5,000		3,350	3,150	2,900	2,700	2,400	2,100	1,800					
51.82	B-221	5083	5083	38,000	16,000		9,500	9,500										
51.82	B-221	5154	5154	30,000	11,000	(9)	7,350	7,350	7,350	7,000	6,400							
51.82	B-221	5456	5456	42,000	19,000		10,500	10,400										
51.82	B-211	6061-T6	6061-T6	38,000	35,000	(12)	9,600	9,200	9,000	8,800	7,200	5,600	4,000					
51.82	B-221	6061-T6W	6061-T6W	4 24,000			6,000	5,900	5,700	5,400	5,000	4,200	3,200					
51.82	B-211																	
51.81	B-247	6061-T6	6061-T6	38,000	35,000	(12)	9,600	9,200	9,000	8,800	7,200	5,600	4,000					
51.81	B-247	6061-T6W	6061-T6W	4 24,000			6,000	5,900	5,700	5,400	5,000	4,200	3,200					
51.81	B-247	6063-T6	6063-T6	30,000	30,000	(12)	9,000	8,400	7,900	7,300	6,100	4,700	3,200					
Castings																		
51.76 [1]	B-61	Steam bronze	2A	34,000	16,000	(14)	8,500	8,400	8,300	8,200	8,100	7,900	7,600	7,200				
51.76	B-62	Ounce metal	4A	30,000	14,000	(14)	7,500	7,300	7,100	6,900	6,800	6,600	13 6,500					
51.76	B-143	Tin bronze 1A	1A	40,000	18,000	(14)	8,000	8,000	7,000	6,000	5,500	5,000						
51.76	B-143	Tin bronze 1B	1B	40,000	18,000	(14)	8,000	8,000	7,000	6,000	5,500	5,000						

See footnotes at end of table.

TABLE 54.03-10(c)—MAXIMUM ALLOWABLE STRESSES[1] FOR NONFERROUS MATERIALS—Continued

Specification	A.S.T.M. designation	Grade		Minimum tensile strength p.s.i.	Minimum yield strength p.s.i.	Notes	For metal temperatures not exceeding ° F.											
		A.S.T.M.	C.G.				100	200	300	400[2]	500	600	700	800	900	1,000	1,100	1,200
Nickel copper plates and sheets																		
51.85	B-127	Hot or cold rolled.	B127	70,000	28,000		17,500	16,500	15,500	14,800	14,700	14,700	14,700	14,500	8,000			
51.85	B-127	Hot rolled (as rolled).	B127	75,000	40,000		18,750	17,500	17,000	17,000	17,000	17,000	16,500	14,500	4,000			
Nickel copper pipe or tubes																		
51.86	B-163	Nickel copper tubes (3" and under).	B163	70,000	28,000		17,500	16,500	15,500	14,800	14,700	14,700	14,700	14,500	8,000			
51.86	B-163	Nickel copper tubes (¼" to ⅜").	B163	90,000	55,000	[16]	22,500	21,200	20,700	20,500	20,500	20,500	19,500	15,000				
51.86	B-163	Nickel copper tubes (other sizes).	B163	85,000	55,000	[16]	21,200	20,200	19,500	19,200	19,200	19,200	18,500	15,000				
51.86	B-165	Nickel copper pipe or tubes.	B165	70,000	28,000		17,500	16,500	15,500	14,800	14,700	14,700	14,700	14,500	8,000			
51.86	B-165	Nickel copper pipe or tubes.	B165	85,000	55,000	[14 17]	21,200	20,200	19,500	19,200	19,200							

[1] All stresses refer to the annealed condition of the material, unless otherwise specified. For wrought material, the allowable "S" values are based upon one-fourth of the minimum tensile strength or two-thirds of the minimum yield strength for temperatures of 150° F. and below, whichever is lower; and upon creep stress or stress-rupture at the higher temperatures. For cast material, the allowable "S" values are based upon one-fifth of the minimum tensile strength for temperatures of 150° F. and below; and upon creep stress or stress-rupture at the higher temperatures.
[2] The same stress may be employed for a temperature of 406° F.
[3] The minimum yield strength employed not included in the specification.
[4] For nominal thickness not greater than 2.00-inch.
[5] Strength of reduced tensile specimen to qualify welding procedures, see § 54.03-1(g)(3).
[6] This material limited to a maximum allowable temperature of 212° F.
[7] This material approved for tube plates only.
[8] For nominal thickness not greater than 2.50-inch.
[9] For nominal thickness not less than 0.25-inch.
[10] The minimum tensile strength employed not included in the specification.
[11] These stresses refer to the light drawn condition.
[12] The same stress may be employed for 320° F.
[13] The stress values given for this material are not applicable when either welding or thermal cutting is employed.
[14] To these stresses a casting quality factor of 0.80 shall be used. This is not intended to apply to valves and fittings complying with A.S.A. standards.
[15] This stress is not permitted for temperatures exceeding 306° F.
[16] The stresses refer to the stress relieved condition.
[17] The maximum operating temperature is (arbitrarily) set at 500° F., because harder temper adversely affects design stress in the creep rupture temperature range.

§ 54.03-12 Cast-iron heads.

(a) The maximum allowable pressure and minimum thickness of circular cast-iron blank spherically dished heads concave to the pressure shall be calculated by the following formulas:

$$P=\frac{ST}{0.6R} \quad (1)$$

$$T=\frac{0.6PR}{S} \quad (2)$$

where:

P=maximum allowable pressure, in pounds per square inch.
T=thickness of dished portion of the head, in inches.
R=radius to which the head is dished measured on the concave side of the head, in inches (not to exceed the inside diameter of the shell to which the head is attached).
S=maximum allowable tensile stress, as given in table 54.03-1 (f), in pounds per square inch.

(b) Cast-iron heads of semi-ellipsoidal form in which the inside depth of the head (one-half of the minor axis of the ellipse) is not less than one-quarter of the inside diameter of the shell to which the head is to be attached, shall have a thickness of at least that required for a cast-iron shell of the same diameter.

(c) Heads flatter than the limits prescribed in this section for dished heads shall be designed as flat plates.

(d) Cast-iron dished heads integral with the cast shell shall have a corner radius equal to at least three times the thickness of the head.

§ 54.03-15 Tube sheets.

(a) The maximum allowable pressure and the minimum thickness of tube sheets shall be calculated by the following formulas:

(1) Stationary or floating tube sheets of monoplate construction clamped between opposing contacts within the bolt circle and freely supported at edge with straight tubes attached by expanding.

$$P=\frac{ST^2}{0.25D^2} \quad (1)$$

$$T=D\sqrt{\frac{0.25P}{S}} \quad (2)$$

(2) Fixed or integral channel-tube sheets firmly secured all around edge, with straight tubes attached by expanding.

$$P=\frac{ST^2}{0.16D^2} \quad (3)$$

$$T=D\sqrt{\frac{0.16P}{S}} \quad (4)$$

(3) Bolted tube sheet having gaskets inside bolt circle, where the setting of the bolts tends to dish the tube sheet, with straight tubes attached by expanding.

$$P=\frac{ST^2}{D^2\left[0.30+\frac{1.4\ Whg}{HD}\right]} \quad (5)$$

$$T=D\sqrt{\frac{P\left[0.30+\frac{1.4\ Whg}{HD}\right]}{S}} \quad (6)$$

(4) Floating tube sheets which are of noncircular design with straight tubes attached by expanding.

$$P=\frac{ST^2}{0.50D^2} \quad (7)$$

$$T=D\sqrt{\frac{0.50P}{S}} \quad (8)$$

where:

P=maximum allowable pressure, in pounds per square inch.
S=maximum allowable stress, 80 percent of the value as given in tables 52.05-10(a) or 54.03-10(c), in pounds per square inch.
T=minimum thickness of unreinforced tube sheet, measured at bottom of partition groove, in inches.
D=mean gasket diameter for flanged attachment; inside diameter of shell when bolted attachment is not employed; or shortest span for noncircular tube sheets measured to center line of gasket if bolted construction is employed; or to point of support if welded construction is employed; in inches.
W=flange design bolt load, in pounds. (See § 54.03-25 (c).)
hg=radial distance from the bolt-circle diameter to the diameter D, in inches.
H=total hydrostatic end force on area bounded by the mean diameter of the gasket or joint contact surface, in pounds.

(b) The minimum thickness of a tube sheet in which tubes are attached by expanding shall be not less than the outside diameter of the tubes.

(c) Tube sheet of a thickness less than that required by paragraph (a) may be considered by the Commandant where stiffened by ribs secured to the tube sheet by continuous penetration or double fillet welds. Such stiffeners will not be considered effective for a distance exceeding 30 plate thicknesses in calculating the section modulus.

(d) Where tubes are welded or brazed to a tube sheet and no expansion joint is employed in the shell construction, consideration may be given by the Commandant to the use of a tube sheet of lesser thickness than required by the formulas in this section, provided the

tube pitch is adequate for welding or brazing.

(e) U-tube tube sheets shall have a thickness of at least 1.25 times the thickness required for tube sheets with straight tubes.

(f) The pitch of tubes attached to tube sheets by roller expanding shall be not less than that specified in Table 54.03–15 (f), except that a lesser tube pitch may be authorized for heat exchangers, the failure of which will not affect the safety of the vessel, provided the manufacturer demonstrates by tests prescribed by the Commandant, using the types of material and identical fabricating procedures to be employed in construction, that he can produce equipment of acceptable workmanship and free of leakage.

TABLE 54.03–15 (f)—MINIMUM PITCH OF TUBES

Outside diameter of tube, in inches	Pitch of tube, in inches
½ and below	⅝
⅝	13/16
¾	15/16
1	1¼
1¼	1⅝
1½	1⅞

(g) Some types of arc- or gas-welded tube sheet attachments which are acceptable are illustrated in figure 54.03–15 (g).

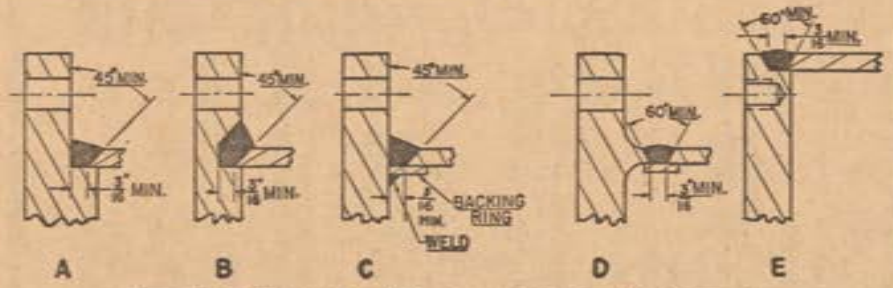


FIGURE 54.03–15 (g)—Acceptable types of tube sheet attachments.

§ 54.03–20 Heat exchanger tubes.

(a) The maximum allowable pressure and the minimum thickness of tubes for heat exchangers subject to internal pressure shall be calculated by the following formulas:

$$P = \frac{2.3\ ST}{D} - 0.036\ S \qquad (1)$$

$$T = \frac{D}{2.3\ S}(P + 0.036\ S) \qquad (2)$$

where:

P = maximum allowable pressure, in pounds per square inch.

S = maximum allowable stress, in pounds per square inch, as given in table 52.05–10 (a) or table 54.03–10 (c), at not less than the maximum expected mean wall temperature. The mean wall temperature is defined as the sum of the outside and inside surface temperatures divided by 2 where the temperature of the heating medium is considered to be for saturated steam at the design conditions and the temperature of the liquid or vapor being heated is the maximum temperature of the fluid at the hot terminal.

T = minimum thickness of the tube wall, in inches.

D = external diameter of the tube, in inches.

(b) Additional wall thickness above the minimum required by formula (2) of this section shall be provided as follows:

(1) When tubes act as stays, additional wall thickness shall be provided to carry the external load imposed upon the tubes.

(2) When tubes are expanded into the tube seats, at least one additional B. W. G. thickness shall be provided over a length at least equal to the width of the seat plus 1 inch.

(3) Bent tubes shall have the thickness increased when the radius is less than 5 times the outside diameter of the tube, to compensate for the reduction in wall thickness due to fabrication.

§ 54.03–25 Bolted flanged connections.

(a) *Scope.* (1) Bolted flanged connections conforming to the American Standard for Steel Pipe Flanges and Flanged Fittings (ASA B16.5) as given in Table 55.07–15 (e) (1) shall be used for connections to external piping and may be used for other flanged connections.

(2) Bolted flanged connections to pressure vessels and special flange designs other than those meeting the requirements of subparagraph (1) of this paragraph shall be designed in accordance with the requirements of this section.

(3) The regulations in this section may be applied to flanges having the gasket entirely within the inner edge of the bolt holes.

(4) This section shall not be construed to prohibit the use of other types of bolted flanged connections, such as flanges using full-face gaskets, or other means to provide effective restraint against flange deflection. Such designs may be used provided the design is acceptable to the Commandant.

(b) *Material.* (1) For temperatures not exceeding 450° F., commercial carbon-steel bolting material may be used for attaching heads, doors, covers, or flanges. Carbon-steel bolting and nut material shall comply with Subpart 51.49 of this subchapter. Bolting and nuts shall meet the minimum requirements of American Standard Coarse Thread Series. Nuts shall meet the requirements of American Standard Heavy Dimensions as given in Table 54.03–25 (b).

(2) For temperatures exceeding 450° F., high strength or alloy steel bolting and nut material complying with the requirements of Subpart 51.49 of this subchapter shall be employed. Nuts of the below classes shall not be used for temperatures exceeding the following: class 1, 750° F.; classes 2 and 2H, 800° F.; class 4, 900° F.; and class 3, 1,050° F. Bolting and nuts shall meet the minimum requirements of the American Standard Heavy Dimensions and the American Standard Threads for High Strength Bolting as given in table 54.03–25 (b). Washers are not required but when used shall be of forged rolled steel.

(3) Studs continuously threaded or bolts with the unthreaded portion reduced to the same diameter as that of the root of the thread, shall be employed when the temperature exceeds 450° F.

(4) Bolting shall have a length of thread engagement of not less than the normal thickness dimension of American Standard heavy nuts.

(5) In no case shall the size of a bolt be less than ½ inch in diameter.

(c) *Bolt loads*—(1) *Operating bolt load.* The minimum required operating

TABLE 54.03–25 (b)—BOLTING AND NUTS

[All dimensions given are in inches]

Diameter	Commercial steel bolts		High strength steel bolts		American Standard heavy nuts semifinished hexagonal		
	Number of threads [1]	Root area	Number of threads [1]	Root area	Width across flats (min.)	Width across corners (min.)	Nut thickness (min.)
¼	13	0.126	13	0.126	0.850	0.969	0.464
⅜	12	.162	12	.162	.909	1.037	.526
½	11	.202	11	.202	1.031	1.175	.657
¾	10	.302	10	.302	1.212	1.382	.720
⅞	9	.419	9	.419	1.394	1.589	.833
1	8	.551	8	.551	1.575	1.796	.956
1⅛	7	.693	8	.728	1.756	2.002	1.097
1¼	7	.890	8	.929	1.938	2.209	1.187
1⅜	6	1.054	8	1.155	2.119	2.416	1.339
1½	6	1.294	8	1.405	2.300	2.622	1.433
1⅝	5½	1.515	8	1.680	2.481	2.828	1.556
1¾	5	1.744	8	1.980	2.662	3.035	1.679
1⅞	5	2.049	8	2.304	2.844	3.242	1.802
2	4½	2.300	8	2.652	3.025	3.449	1.925
2¼	4½	3.021	8	3.423	3.388	3.862	2.155
2½	4	3.716	8	4.292	3.750	4.275	2.401
2¾	4	4.619	8	5.259	4.112	4.688	2.647
3	4	5.621	8	6.324	4.475	5.102	2.893

[1] All bolting shall have threads at least as strong as American Standard screw threads.

TABLE 54.03-25 (c1)—GASKET MATERIALS AND CONTRACT FACINGS

GASKET FACTORS (m) FOR OPERATING CONDITIONS AND MINIMUM DESIGN SEATING STRESS (y)

GASKET MATERIAL		GASKET FACTOR m	MIN. DESIGN SEATING STRESS y	SKETCHES	FACING LIMITATIONS	USE COL.
Rubber without fabric or a high percentage of asbestos fiber) Below 75 Shore Durometer		0.50	0		Use 1, 2, 3 only	I, II
75 or higher Shore Durometer		1.00	200			
Asbestos with a suitable binder for the operating conditions	1/8 thick	2.00	1600			
	1/16 thick	2.75	3700			
	1/32 thick	3.50	6500			
Rubber with cotton fabric insertion		1.25	400		Same	
Rubber with asbestos fabric insertion, with or without wire reinforcement	3-ply	2.25	2200			
	2-ply	2.50	2900			
	1-ply	2.75	3700			
Vegetable fiber		1.75	1100		1, 2, 3	
Spiral-wound metal, asbestos filled	Carbon	2.50	2900		Use 1a, 2* only	II
	Stainless	3.00	4500			
Serrated steel	Asbestos filled	2.25	2700			
Corrugated metal, Asbestos Inserted or Corrugated metal, Jacketed asbestos filled	Soft aluminum	2.50	2900			
	Soft copper or brass	2.75	3700			
	Iron or soft steel	3.00	4500			
	Monel or 4-6% chrome	3.25	5500			
	Stainless steels	3.50	6500			
Corrugated metal	Soft aluminum	2.75	3700			
	Soft copper or brass	3.00	4500			
	Iron or soft steel	3.25	5500			
	Monel or 4-6% chrome	3.50	6500			
	Stainless steels	3.75	7800			
Flat metal jacketed asbestos filled	Soft aluminum	3.25	5500		Use 1a, 2* ONLY	
	Soft copper or brass	3.50	6500			
	Iron or soft steel	3.75	7600			
	Monel	3.50	8000			
	4-6% chrome	3.75	9000			
	Stainless steels	3.75	9000			
Grooved iron or soft steel with or without metal jacketed	Soft aluminum	3.25	5500		Use 1, 2, 3 only	
	Soft copper or brass	3.50	6500			
	Iron or soft steel	3.75	7600			
	Monel or 4-6% chrome	3.75	8000			
	Stainless steels	4.25	10100			
Solid flat metal	Soft aluminum	4.00	8800		Same	I
	Soft copper or brass	4.75	13000			
	Iron or soft steel	5.50	18000			
	Monel or 4-6% chrome	6.00	21800			
	Stainless steels	6.50	26000			
Ring joint	Iron or soft steel	5.50	18000		Use R only	
	Monel or 4-6% chrome	6.00	21800			
	Stainless steel	6.50	26000			

* THE SURFACE OF A GASKET HAVING A LAP SHOULD BE AGAINST THE SMOOTH SURFACE OF THE FACING AND NOT AGAINST THE HUBBING.

EFFECTIVE GASKET WIDTH

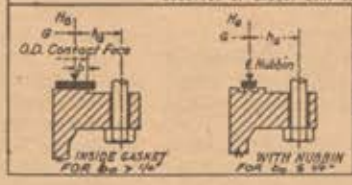
FACING SKETCH (Column I/Column II)	BASIC GASKET SEATING WIDTH b_o COLUMN I	BASIC GASKET SEATING WIDTH b_o COLUMN II
1a	$\frac{N}{2}$	$\frac{N}{2}$
1b	$\frac{W+T}{2}\left(\frac{W+N}{4}\ \text{max}\right)$	$\frac{W+T}{2}\left(\frac{W+N}{4}\ \text{max}\right)$
2	$\frac{W+N}{4}$	$\frac{W+3N}{8}$
3	$\frac{W}{2}\left(\frac{W}{4}\ \text{min}\right)$	$\frac{W+3N}{8}\left(\frac{3N}{8}\ \text{min}\right)$
4	$\frac{3N}{8}$	$\frac{7N}{16}$
5		
6	$\frac{N}{4}$	$\frac{3N}{8}$
7		
8	$\frac{N}{8}$	

EFFECTIVE GASKET SEATING WIDTH "b"

$b = b_o$, when $b_o \leq \frac{1}{4}$"

$b = \frac{1}{2}\sqrt{b_o}$, when $b_o > \frac{1}{4}$"

LOCATION OF GASKET LOAD REACTION



NOTE: The gasket factors listed only apply to flanged joints in which the gasket is completely within the inner edges of the bolt holes.

bolt load W_{m_1} shall be determined by formula (1) under maximum operating conditions.

$$W_{m_1} = H + H_p = 0.785\,G^2P + (2b \times 3.14\,GmP) \quad (1)$$

NOTE 1: Under maximum operating conditions the minimum required operating bolt load W_{m_1} is the load required to resist the hydrostatic end force H exerted by the maximum internal pressure upon the area bounded by the mean diameter of the gasket, and, in addition, maintain a compression load H_p on the gasket or joint-contact surface which experience has shown to be sufficient to insure a tight joint.

(2) *Initial bolt load.* The minimum required initial bolt load W_{m_2} shall be determined by formula (2) under atmospheric temperature conditions without consideration of internal pressure.

$$W_{m2} = H_y = 3.14\,bGy \quad (2)$$

NOTE 2: Under atmospheric temperature conditions without consideration of internal pressure, the minimum required initial bolt load W_{m_2} is the load H_y required to seat the gasket or joint-contact surfaces sufficiently to insure a tight joint.

(3) *Bolt areas.* (i) The total required bolt area A_m shall be determined from the greater of the values obtained from formula (3) under operating conditions, or from formula (4) under atmospheric temperature conditions without consideration of internal pressure.

$$A_{m_1} = \frac{W_{m_1}}{S_b} \quad (3)$$

$$A_{m_2} = \frac{W_{m_2}}{S_a} \quad (4)$$

(ii) The actual total cross-sectional area of the bolts A_b shall be not less than A_m.

(4) *Flange design bolt load.* The bolt load W used in the design of the flange shall be not less than the greater of the values obtained from formula (1) under maximum operating conditions, or from formula (5) under atmospheric temperature conditions without consideration of internal pressure.

$$W = \frac{(A_m + A_b)}{2} S_a \quad (5)$$

(5) *Nomenclature of bolt and flange design symbols.* The symbols used in this paragraph mean:

W_{m_1} = minimum required bolt load for maximum operating conditions, in pounds.
W_{m_2} = minimum required initial bolt load for atmospheric temperature conditions without consideration of internal pressure, in pounds.
W = flange design bolt load, in pounds.
H = total hydrostatic end force, in pounds.
H_p = total joint-contact-surface compression load, in pounds.
H_y = total joint-contact-surface-seating load, in pounds.
G = mean diameter of gasket or joint-contact-surface, in inches (except for lap joints with full face gasket, in which case it is midpoint of contact between flange and lap).
P = maximum allowable pressure, in pounds per square inch.
b = effective gasket or joint-contact-surface seating width, in inches (see table 54.03-25 (c1)).
$2b$ = effective gasket or joint-contact-surface pressure width, in inches (see table 54.03-25 (c1)).
N = possible contact width of gasket in inches (see table 54.03-25 (c1)).
w = width of local concentration on gasket, in inches (see table 54.03-25 (c1)).
m = limit contact compression factor (see table 54.03-25 (c1)).
y = gasket or joint-contact-surface unit seating stress, in pounds per square inch (see table 54.03-25 (c1)).
S_b = maximum allowable bolt stress at operating temperature, in pounds per square inch, as given in table 52.05-10 (a).
S_a = maximum allowable bolt stress at atmospheric temperature, in pounds per square inch, as given in table 52.05-10 (a).
A_m = total required cross-sectional area of bolts at root of thread or section of least diameter under stress, in square inches.
A_b = total actual cross-sectional area of bolts at root of thread or section of least diameter under stress, in square inches.

(d) *Shell flange attachments.* (1) The flanges covered by this paragraph are intended to be used for shell attachments to tube sheets, channels and end covers of unfired pressure vessels and heat exchangers.

(2) Except as otherwise provided for in this paragraph, shell flange attachments shall comply with the requirements of § 55.07-15(f) of this subchapter.

(3) Ring flanges of the type shown in Figures 55.07-15 (f3) and (f6) may be

used for pressures not exceeding 300 p.s.i. and temperatures not exceeding 650° F.

(4) Ring flanges of the plate or slip-on type welded to the shell by means of full penetration welds may be used for pressures not exceeding 600 p.s.i. and temperatures not exceeding 700° F. Some acceptable types of full penetration welded joints are shown in Figure 52.25-45(d), details (a), (b), (c), (g), and (h).

§ 54.03-27 Unfired steam boilers.

(a) Unfired pressure vessels in which steam is generated shall be classed as unfired steam boilers except that pressure vessels known as evaporators or heat exchangers may be classed as unfired pressure vessels.

(b) Unfired steam boilers shall be constructed in accordance with the requirements of Part 52 or 54 of this subchapter. When the maximum allowable pressure exceeds 30 p.s.i., unfired steam boilers shall comply with the requirements for Class I pressure vessels.

(c) Unfired steam boilers shall be fitted with an efficient water level indicator, a pressure gage and a blowdown valve.

(d) An approved safety valve shall be fitted on unfired steam boilers as required by § 54.07-10.

§ 54.03-30 Evaporators.

(a) An evaporator in which steam is generated shall be fitted with an efficient water level indicator, a pressure gauge, and a blowdown valve.

(b) An approved safety valve shall be fitted on evaporators as required by § 54.07-10.

§ 54.03-35 Access and inspection openings.

(a) All unfired pressure vessels for use with compressed air or where subject to internal corrosion shall be provided with suitable manhole, handhole, or other inspection openings for examination and cleaning.

(b) Unless otherwise specified in this subchapter, the access and inspection openings in the shell or head of an unfired pressure vessel shall comply with the requirements of Subpart 52.24 of this subchapter for power boilers.

(c) (1) Vessels not exceeding 12 inches in inside diameter are not required to have inspection openings.

(2) Vessels over 12 inches but not exceeding 16 inches in inside diameter need not be provided with inspection openings if the vessels are fitted with two pipe connections of at least 1½ inches in pipe size which can be disconnected for inspection.

(d) All unfired pressure vessels which require access or inspection openings shall be equipped as follows:

(1) Vessels over 12 inches but less than 18 inches in inside diameter shall have at least two plugged, threaded inspection openings of not less than 1½ inches pipe size.

(2) Vessels 18 to 36 inches, inclusive, in inside diameter shall have at least two threaded pipe plug inspection openings of not less than 2 inches pipe size, or two handholes, or one manhole.

(3) Vessels over 36 inches in diameter shall have a manhole, except those whose shape or use make it impracticable, in which case they shall have at least two 4 x 6 inch handholes or two handholes of equivalent area.

(4) When handholes or plugged openings are used for inspection openings in place of a manhole, where permitted, one handhole or one plugged opening shall be placed in each head or in the shell near each head.

(5) Removable heads or cover plates may be used in place of the required openings provided they are equal at least to the required size of the required inspection openings.

§ 54.03-40 Openings and reinforcements.

(a) Unless otherwise specified in this subchapter, openings and reinforcements in the shell or heads of unfired pressure vessels shall comply with the requirements of Subpart 52.25 in Part 52 of this subchapter for power boilers.

(b) The thickness of nozzles attached to shells or heads of unfired pressure vessels shall be not less than that required for Schedule 40 pipe of the same diameter, and in no case shall the nozzle wall thickness be less than that determined by § 55.07-5 of this subchapter.

(c) (1) Screwed and flanged piping connections to the outlets on a pressure vessel shall comply with the requirements of Part 55 of this subchapter, except as otherwise provided for in this paragraph.

(2) Plate or slip-on type flange attachments to nozzles with full penetration welds may be used for pressures not exceeding 600 p.s.i. and temperatures not exceeding 700° F.

(d) Some types of acceptable arc-welded connections to shells, drums or headers are illustrated in figure 52.25-45 (d) in Part 52 of this subchapter.

Subpart 54.07—Pressure-Relief Devices

§ 54.07-1 General requirements.

(a) Unfired pressure vessels, such as tanks, containing liquids, gases, or vapors, and in which steam is not generated, shall be protected by a relief valve set to relieve at a pressure not exceeding that for which the vessel is designed and of sufficient relieving capacity to prevent a pressure increase exceeding 10 percent above the maximum allowable pressure, except as provided for in paragraph (b) of this section.

(b) Where an additional hazard can be created by exposure of an unfired pressure vessel containing compressed gas to fire or other unexpected sources of external heat (for example, vessels used for the transportation of liquefied compressed gases) relief valves shall be capable of preventing the pressure from rising more than 20 percent above the maximum allowable pressure of the vessel. The minimum required relief valve capacities for liquefied compressed gases are in Part 38 of Subchapter D (Tank Vessels) and in Part 146 of Subchapter N (Dangerous Cargoes) of this chapter.

(c) Pressure-relief devices shall be constructed so that they can not be readily rendered inoperative, and shall be so located, and installed as to be readily accessible for inspection and repair.

(d) For certain pressure vessels containing substances that may render a relief valve inoperative, or where the installation of a relief valve is considered impracticable, the Commandant may authorize the use of a rupture disk in lieu of a relief valve, provided such pressure vessels contain liquids or vapors that are not lethal or noxious and the temperature of the contents does not exceed 212° F. When the use of rupture disks is approved by the Commandant, the installation shall comply with the requirements of § 54.07-20.

(e) The opening through all pipes and fittings between a pressure vessel and its pressure-relieving device shall have at least the area of the pressure-relieving device inlet, and in all cases shall have sufficient area so as not to unduly restrict the flow to the pressure-relieving device. The opening in the vessel shall be designed to provide direct and unobstructed flow between the vessel and its pressure-relieving device.

§ 54.07-5 Relief valves.

(a) All relief valves for use on unfired pressure vessels or on piping systems where approved safety valves are not required shall in general comply with the requirements for safety valve construction in Subpart 162.001 or 162.012 of Subchapter Q (Specifications) of this chapter and shall be designed to suitably meet the protection and service requirements for which they are intended, except that relief valves are not required to have huddling chambers for service other than steam.

(b) In no case shall the diameter of a relief valve be less than ½ inch.

(c) Cast iron may be employed in the construction of relief valves for pressures not exceeding 125 pounds per square inch and temperatures not exceeding 450° F. Seats or disks of cast iron are prohibited.

(d) Relief valves for steam or air service shall be provided with a substantial lifting device so that the disk can be lifted from its seat when the pressure in the vessel is 75 percent of that at which the valve is set to blow.

(e) If the design of a relief valve is such that liquid can collect on the discharge side of the disk, the valve shall be equipped with a drain at the lowest point where liquid can collect.

(f) The spring in a relief valve in service for pressures up to and including 250 pounds per square inch shall not be re-set for any pressure more than 10 percent above or 10 percent below that for which the relief valve is marked. For higher pressures, the spring shall not be re-set for any pressure more than 5 percent above or 5 percent below that for which the relief valve is marked.

(g) The capacities of relief valves shall be rated at pressures of 3 percent for steam, 10 percent for gases or vapors, and at 10 or 25 percent for liquids above

the pressure at which the valve is set to operate.

§ 54.07–10 Safety valves.

(a) An approved safety valve set to relieve at a pressure not exceeding that for which the shell is designed shall be fitted to all unfired steam boilers and evaporators, except the following:

(1) Unfired steam boilers and evaporators of the coil or tube type designed to operate with a steam inlet pressure not exceeding 15 p.s.i. gage.

(2) Evaporators of the atmospheric type designed for vapor discharge direct to a distiller with no shutoff valve in the discharge line. The distiller connected to atmospheric evaporators shall be fitted with a vent to obviate a buildup in pressure. In no case shall the vent be less than 1½ inches in diameter.

(b) Safety valves for use on unfired pressure vessels in which steam or pressure is generated shall comply with the requirements specified in Part 52 of this subchapter for power boilers when subject to pressures exceeding 30 p.s.i., and Part 53 of this subchapter for low pressure heating boilers when subject to pressures of 30 p.s.i. or less.

(c) The relieving capacity of evaporator safety valves required by paragraph (a) of this section shall be at least equal to the capacity of the orifice fitted in the steam supply to the evaporator. The orifice capacity shall be determined in accordance with Formula (1) or (2) as follows:

(1) Where the set pressure of the evaporator shell safety valve is 58 percent or less than the setting of the safety valve in the steam supply:

$$W = 51.45\ AP \qquad (1)$$

(2) Where the set pressure of the evaporator shell safety valve exceeds 58 percent of the setting of the safety valve on the steam supply:

$$W = 105.3\ A\sqrt{P_1\ (P - P_1)} \qquad (2)$$

where:

W = the required orifice capacity, in pounds per hour.
A = cross-sectional area of rounded entrance orifice, in square inches.[1]
P = set pressure of steam supply safety valve, in pounds per square inch, absolute.
P_1 = set pressure of evaporator shell safety valve, in pounds per square inch, absolute.

[1] The orifice shall be installed near the steam inlet of the coils or tubes and where no orifice is employed the area used in the formula shall be that of the inlet connection or manifold.

(d) The relieving capacity of safety valves on unfired steam boilers shall not be less than the maximum generating capacity of the unfired steam boiler as certified by the manufacturer.

(e) On new installations and where the orifice size of an existing unfired steam boiler or evaporator is increased, an accumulation test shall be made by closing all steam outlet connections except the safety valves for a period of five minutes. When conducting the accumulation test, the water shall be at the normal operating level and the steam pressure shall be at the normal operating pressure, and while under this test the pressure shall not rise more than six percent above the safety valve setting.

§ 54.07–15 Heat exchanger relief valves.

(a) A heat exchanger with liquid in the shell and the heating medium in the tubes or coils, shall be fitted with a liquid relief valve meeting the requirement of § 54.07–1.

(b) (1) A heat exchanger with steam in the shell and liquid in the tubes or coils at a pressure exceeding that in the shell, shall have a liquid relief valve fitted to protect the shell against excess pressure.

(2) The discharge capacity of such relief valves shall be calculated on the basis of the discharge from one tube using the difference in pressures between that in the shell and that in the tubes, and shall be not less than that determined by the following formula:

$$Q = 29.81\ KD^2\sqrt{P_1 - P_2} \qquad (1)$$

where:

Q = required relief valve discharge capacity, in gallons per minute, based on relief valve set pressure.
P_1 = pressure in the tube or coils, in pounds per square inch.
P_2 = set pressure of the shell relief valve, in pounds per square inch.
D = internal diameter of the largest tube or coil, in inches.
K = coefficient of discharge = 0.62.

§ 54.07–20 Rupture disks.

(a) Every rupture disk shall have a specified bursting pressure at a specified temperature, shall be marked with a lot number and shall be guaranteed by its manufacturer to burst at within 5 percent (plus or minus) of its specified bursting pressure.

(b) The specified bursting pressure at the coincident operating temperature shall be determined by bursting two or more specimens from a lot of the same material and of the same size as those to be used. The test shall be made in a holder of the same form and pressure area dimensions as that with which the disk is to be used.

(c) Where it is desired to minimize the loss by leakage through the safety or relief valve of liquids or vapors, the rupture disk may be installed between a safety or relief valve and the vessel, provided the following requirements are met:

(1) The bursting pressure of the disk does not exceed the maximum allowable pressure of the vessel.

(2) The connection between the rupture disk and the relief valve is provided with a pressure gauge, test cock, or free vent to atmosphere, to indicate when the rupture disk has leaked or burst.

(3) The opening provided through the rupture disk, after breakage, is sufficient to permit a flow equal to the capacity of the attached valve and there is no chance of interference with the proper functioning of the relief valve; but in no case shall this area be less than the inlet area of the relief valve.

§ 54.07–25 Safety relief valves.

(a) Unfired pressure vessels containing liquefied compressed gases and where required by the regulations of this subchapter, shall be fitted with one or more approved safety relief valves designed, constructed and flow-tested for capacity in conformance with Subpart 162.018 of Subchapter Q (Specifications) of this chapter.

(b) Each safety relief valve shall be set to start to discharge at a pressure not in excess of the maximum allowable pressure of the vessel and the combined relieving capacities of the safety relief valves shall be sufficient to prevent a rise of pressure in the vessel of more than 20 percent above the maximum allowable pressure when all the safety relief valves are blowing.

(c) The minimum rates of discharge of the safety relief valves for liquefied compressed gas service shall be not less than that required by the applicable regulations governing the transportation in bulk of the particular commodity.

NOTE: The requirements covering the transportation of liquefied petroleum gases in bulk may be found in Part 38 of Subchapter D (Tank Vessels) of this chapter. The requirements covering the transportation in bulk of certain liquefied compressed gases of a hazardous nature, but not considered flammable, may be found in Part 146 of Subchapter N (Dangerous Cargoes) of this chapter.

(d) (1) Except as otherwise specified in this paragraph, each safety relief valve shall be tested in the presence of an inspector before being placed in service. The tests shall satisfactorily indicate that the safety relief valves will start to discharge at a pressure not in excess of the design pressure of the tank.

(2) Safety relief valves fitted with a breaking pin and rupture disk need not be tested in the presence of a marine inspector before being placed in service. In lieu thereof, a certificate shall be furnished with the valve attested to by the manufacturer that the requirements of subparagraph (1) of this paragraph are met.

PART 55—PIPING SYSTEMS AND APPURTENANCES

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Subpart 55.17—Hydraulic Systems

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55.17-25 Hydraulic hose and fittings.
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55.17-35 Hydraulic cylinders.
55.17-40 Tests.

AUTHORITY: The provisions of this Part 55 issued under R.S. 4405, as amended, 4462, as amended; 46 U.S.C. 375, 416. Interpret or apply R.S. 4399, as amended, 4400, as amended, 4417, as amended, 4417a, as amended, 4418, as amended, 4421, as amended, 4426–4431, as amended, 4433, as amended, 4434, as amended, 4453, as amended, 4488, as amended, 4491, as amended, sec. 14, 29 Stat. 690, as amended, sec. 10, 35 Stat. 428, as amended, 41 Stat. 305, as amended, secs. 1, 2, 49 Stat. 1544, 1545, as amended, sec. 17, 54 Stat. 166, as amended, sec. 3, 54 Stat. 347, as amended, sec. 3, 70 Stat. 152, sec. 3, 68 Stat. 675; 46 U.S.C. 361, 362, 391, 391a, 392, 399, 404–409, 411, 412, 435, 481, 489, 366, 395, 363, 367, 526p, 1333, 390b, 50 U.S.C. 198; E.O. 11239, July 31, 1965, 30 F.R. 9671, 3 CFR, 1965 Supp. Treasury Department Orders 120, July 31, 1950, 15 F.R. 6521; 167-14, Nov. 26, 1954, 19 F.R. 8026; 167-20, June 18, 1956, 21 F.R. 4894; CGFR 56-28, July 24, 1956, 21 F.R. 5659; 167-38, Oct. 26, 1959, 24 F.R. 8857, unless as otherwise noted.

Subpart 55.01—General

§ 55.01-1 Scope.

(a) This part contains requirements for the various ships' piping systems and appurtenances.

(b) The respective piping systems installed on vessels shall have the necessary pumps, valves, regulating valves, safety valves, relief valves, flanges, fittings, pressure gauges, liquid level indicators, thermometers, etc., for safe and efficient operation of the vessel.

(c) Piping systems which do not fully comply with the requirements of this subchapter may be accepted for installation on vessels subject to inspection provided:

(1) They are limited to handling petroleum and associated products for use in offshore drilling operations.

(2) The design, material and fabrication comply with the requirements of the American Petroleum Institute (API) for such piping.

§ 55.01-5 Definitions.

(a) *Piping.* The word "piping" within the meaning of the regulations in this subchapter, refers to fabricated pipes or tubes with flanges and fittings attached, for use in the conveyance of vapors, gases, or liquids, regardless of whether the diameter is measured on the inside or the outside.

(b) *Nominal diameter.* The term "nominal diameter" as used in this part, except in § 55.07-5 (a), means the commercial diameter of the piping.

§ 55.01-10 Plan approval.

(a) Plans in triplicate for new construction and major alterations showing the respective piping systems shall be submitted to the Officer in Charge, Marine Inspection, in the district in which the vessel is to be built, or alterations are to be made, except that when, due to location of the shipyard or design office, such a procedure would result in unnecessary delay in transmission, the plans may be forwarded directly to the Commandant (MMT), United States Coast Guard, Washington, D.C., 20226.

(b) Piping materials and appliances such as pipe, tubing, fittings, flanges, and valves, except safety valves as specified by Subpart 52.65 of this subchapter, are not required to be specifically approved by the Commandant, but shall comply with the applicable requirements for materials, construction, markings, and testing. Drawings listing material specifications and showing details of welded joints for pressure-containing appurtenances of welded construction shall be submitted in accordance with paragraph (a) of this section.

(c) (1) Prior to installation aboard ship, arrangement drawings and diagrams of the following systems shall be submitted for approval.

(i) Steam piping (arrangement drawings of systems exceeding 125 p. s. i. only are required to be submitted for approval).

(ii) Boiler feed and blowoff piping.

(iii) Fuel oil service, transfer and fill piping.

(iv) Fire-extinguishing systems including fire main and sprinkler piping, steam smothering and inert gas and foam.

(v) Bilge and ballast piping.

(vi) Salt water tank cleaning piping.

(vii) Vent, sounding and overflow piping.

(viii) Cargo piping.

(2) Diagrams only of the following systems shall be submitted for approval:

(i) Steam and exhaust piping (systems not exceeding 125 p. s. i.).

(ii) Compressed air piping.

(iii) Steam drain piping.

(iv) Refrigeration piping.

(v) Lubricating oil piping.

(vi) Condenser circulating water piping.

(vii) Hydraulic oil piping.

(viii) Internal combustion engine fuel piping.

(ix) Safety valve escape piping.

(x) Plumbing, deck drains and overboard discharge piping.

(d) Standard drawings of the following piping fabrication details shall be submitted for approval:

(1) Sea suction and discharge connections.

(2) Fabricated valves and fittings (class I and class II piping).

(3) Welded pipe joints (class I and class II piping).

(e) The plans shall include a list of material furnishing pipe diameters, wall thicknesses, design pressure, material specifications, type, size and pressure rating of valves, flanges, and fittings. Where piping systems are intended to convey superheated steam, the temperature of same shall be indicated. Pump capacities and pump shutoff heads shall appear on the piping diagrams.

§ 55.01-15 Affidavit.

A manufacturer of pipe, tubing, valves, flanges, pipe fittings, castings, forgings, and bolting shall file with the Commandant a duly executed copy of form CG-935A, certifying that the product furnished by him conforms to all the requirements given in this subchapter.

Subpart 55.04—Piping Classification

§ 55.04-1 Scope.

Piping shall be divided into two classes, Class I and Class II.

§ 55.04-5 Class I piping.

(a) Class I piping includes the various systems conveying mediums exceeding either pressures or temperatures as set forth in Table 55.04-5.

TABLE 55.04-5—PRESSURE AND TEMPERATURE LIMITATIONS

Service	Pressure, pounds per square inch	Temperature ° F.
Lethal gases and liquids	Any	Any
Gases and vapors	150	650
Water	225	350
Fuel oil	150	150
Lubricating oil	225	400
Liquefied compressed gases	150	----------
Cargo oil, Grades A through D	225	150
Cargo oil, Grade E	225	400
Cargo oil, asphalt	225	400
Heat transfer oils	225	400
Molten sulfur	225	330

§ 55.04-10 Class II piping.

Class II piping shall include piping system conveying mediums at or below the pressures or temperatures specified in Table 55.04-5, except that exhaust piping from internal combustion engines may comply with the requirements for Class II piping.

Subpart 55.07—Detail Requirements

§ 55.07–1 Material.

(a) Materials used in the manufacture of pipe, valves, flanges, fittings or bolting shall conform with the requirements of this part, and shall comply with the respective specifications of Part 51 of this subchapter unless alternate equivalent material is approved by the Commandant.

(b) Pipe and flange materials are acceptable for the pressures and temperatures listed in Table 55.07–1(b).

TABLE 55.07–1(b)—PIPING MATERIALS [1]

Material specification subpart	A.S.T.M. specification	Grade	Maximum design		Limitation
			Pressure p.s.i.	Metal temperature ° F.	
Steel pipe					
Seamless-carbon:					
51.34	A53	P53-A, B	None	750	
51.34	A106	P106-A, B, C	None	800	
Seamless-alloy:					
51.34	A335	P1	None	875	
51.34	A335	P2	None	900	
51.34	A335	P3, P3b	None	1,050	
51.34	A335	P11	None	1,050	
51.34	A335	P12	None	1,050	
51.34	A335	P21	None	1,050	
51.34	A335	P22	None	1,050	
51.34	A312	TP321, TP347	None	1,050	
Electric-resistance welded:					
51.34	A53	P53-RW-A, B	350	650	
51.34	A135	P135-A, B	350	650	
Lap-welded: 51.34	A53	P53-LW	250	450	
Butt-welded: 51.34	A53	P53-BW	250	450	
Wrought iron pipe					
Lap-welded: 51.34	A72	P72-LW	250	450	
Butt-welded: 51.34	A72	P72-BW	250	450	
Copper and copper-alloy pipe and tubing					
Seamless copper:					
51.70	B42	B42	None	406	[2] [3].
51.73	B75	B75-A, B, C	None	406	[2] [3].
51.73	B88	B88-K, L, M	None	406	[2] [3].
51.73	B111	B111-A, B	None	406	[2] [3].
Copper-alloy:					
51.70	B43	B43 (Red brass)	None	406	
51.73	B111	B111-C (Adm. metal)	None	406	
51.73	B111	B111-D (Al-brass)	None	450	
51.73	B111	B111-E (Al-bronze)	None	450	
51.73	B111	B111-F (Red brass)	None	406	
51.73	B111	B111-G (70-30 Cu-Ni)	None	500	
51.73	B111	B111-H (80-20 Cu-Ni)	None	500	
51.73	B111	B111-I (90-10 Cu-Ni)	None	500	
Brazed copper			75	320	[4].
Plates					
Carbon steel:					
51.04	A201	A, B	150	650	[5] [6].
51.04	A212	C, D	150	650	[5] [6].
51.22	A285	C	150	650	[6].

[1] The carbon content of the material listed in Table 55.07–1(b) shall not exceed 0.35 percent if welded fabrication is to be employed.
[2] Copper pipe shall not be used for hot oil service other than short flexible connections at the burners.
[3] Copper pipe shall be annealed prior to installation for Class I piping systems.
[4] Copper pipe fabricated with brazed longitudinal joints shall be limited to water or saturated steam service for the maximum pressure and temperature as indicated.
[5] These limitations apply only when plates are used as flange material. See Table 52.05–10(a) for maximum design temperatures of plate material used in the construction of pressure vessels.
[6] Not permitted for hubbed flanges. Ring type flanges may be machined from plate.

(c) Forged steel or cast steel, conforming to the requirements of Subparts 51.46 and 51.58 of this subchapter, may be used for the construction of valves and fittings for any system without pressure limitation, subject to the maximum design temperatures as specified in table 52.05–10 (a) in Part 52 of this subchapter. Grades F181–I and II, Subpart 51.46, may be used in the construction of valves and fittings for pressures and temperatures not exceeding those allowed for 300-pound service pressure rating for steel pipe flanges and flanged fittings.

(d) Bronze castings conforming to the requirements of Subpart 51.76, of this subchapter, for Grade 4A (ounce metal) may be used in the construction of valves and fittings for pressures not exceeding 150 pounds per square inch and temperatures not exceeding 366° F. Grade 2A (steam bronze) and Grades 1A and 1B (tin bronze) may be used for steam pressures not exceeding 300 pounds per square inch and temperatures not exceeding 450° F., and for hydraulic or compressed air service at higher pressures where the temperature does not exceed 150° F.

(e)(1) Malleable iron castings conforming to the requirements of Subpart 51.61 of this subchapter for Grade A1 or A2 material, may be used in the construction of valves and fittings for pressures not exceeding 300 pounds per square inch and temperatures not exceeding 450 degrees F. Grade B malleable iron may be used for pressures not exceeding 150 pounds per square inch and temperatures not exceeding 450 degrees F. Cast iron conforming to the requirements of Subpart 51.61 may be used in the construction of valves and fittings for maximum saturated steam service pressure of 125 pounds per square inch. Cast iron conforming to the requirements of Subpart 51.61 may also be used in the construction of valves and fittings for maximum liquid and gas service pressures of 100 pounds per square inch at 340 degrees F. and 150 pounds per square inch at 150 degrees F. or less. Intermediate values may be obtained by interpolation. For exceptions to these limits see subparagraphs (2), (3), and (4) of this paragraph.

(2) Malleable iron and cast-iron valves and fittings designed and marked for Class 300 refrigeration service may be used for such service, provided the pressure limitation of 300 pounds per square inch is not exceeded. Malleable iron flanges of this class may also be used in sizes 4 inches and smaller (oval and square design).

(3) Cast iron conforming to the requirements of Subpart 51.61 of this subchapter may be used in the construction of valves and fittings of special design for hydraulic systems. Prior to use of such valves and fittings for pressures exceeding 150 pounds per square inch, each design shall be subjected to a high shock test by a recognized testing laboratory as prescribed by the Commandant and shall show no fracture when subjected to the impact test.

(4) Nodular cast iron conforming to the requirements of Subpart 51.61 of this subchapter, Grade 60–45–15, may be used in the construction of valves and fittings complying with 125-pound and 250-pound cast iron standards, or 150-pound and 300-pound steel standards, and for temperatures not exceeding 650 degrees F. Adjusted pressure ratings for temperatures not exceeding 650 degrees F. shall be 80 percent of the steel ratings specified in ASA Standards listed in Table 55.07–15(e)(1), except as otherwise specified in this subchapter.

(f) Ferrous pipe used for salt-water service should be protected against corrosion by hot-dipped galvanizing or other suitable means.

(g) Carbon-steel bolting material conforming to the requirements of Subpart 51.49 of this subchapter may be used for temperatures not exceeding 450° F. For temperatures exceeding 450° F., alloy-steel bolting material as specified in Subpart 51.49 shall be employed.

(h)(1) Except as otherwise provided for in this paragraph, plastic pipe may be used for fresh and salt water supply to nonvital machinery and to all machinery fitted with a duplicate standby unit, and for other piping systems as may be authorized by the Commandant. Plastic pipe may be used in lines which lead through watertight decks or bulkheads provided a spool piece and shutoff valve constructed of an acceptable metallic material is fitted at the bulkhead. Such valves shall be operable from above the bulkhead deck. Plastic pipe shall not be used in any overboard discharge line outboard of the required overboard discharge valves.

(2) Plastic piping shall be limited to a maximum pressure of 150 p.s.i. and a maximum temperature of 140° F., or as may be authorized by the Commandant.

(3) Material used in the fabrication of plastic pipe shall be unplasticized rigid polyvinylchloride (PVC) or reinforced resins, or such other plastic material as may be authorized by the Commandant. The flammability of the plastic pipe shall not exceed the burning rate of the self-extinguishing type as determined by the standard ASTM test method (D-635).

(4) The wall thickness of plastic pipe shall not be less than Schedule 40 I. P. S. The pipe shall be designed to withstand a hydrostatic bursting pressure of not less than 5 times the maximum allowable pressure and shall have a minimum tensile strength of at least 5,000 p. s. i.

(5) Pipe joints shall be of the slip-sleeve, socket or screwed type. Screwed joints shall be used on pipe having at least Schedule 80 wall thickness.

(i) (1) Except as otherwise provided for in this paragraph, flexible hose and hose assemblies may be used for fresh and salt water supply to quarters, sanitary drains, cooling water supply to non-vital machinery and to all machinery fitted with a duplicate standby unit or duplicate piping system, and for other piping systems as may be authorized by the Commandant. Flexible hose may be used in lines which lead through watertight decks or bulkheads provided a spool piece and shutoff valve constructed of an acceptable metallic material are fitted at the bulkhead. Such valves shall be operable from above the bulkhead deck. Flexible hose shall not be installed outboard of the required overboard discharge valves.

(2) Nonmetallic flexible hose shall be fabricated with an inner tube and cover of synthetic rubber or other suitable material reinforced with wire braid. The material for the cover shall be fire-resistant. The inner tube shall be of seamless construction, uniform gage and shall be compatible with the substance carried therein.

(3) Piping systems using flexible hose shall be limited to a maximum pressure of 150 pounds per square inch except that short lengths of flexible hose may be installed in fuel and lubricating lines at or near machinery units and in pneumatic and hydraulic systems where flexibility is required. Unreinforced flexible hose may be used in water and pneumatic piping systems for pressures not exceeding 50 pounds per square inch. For flexible hose installed in hydraulic systems, see § 55.17-25.

(4) Flexible hose assemblies shall be designed for a bursting pressure of not less than 4 times the maximum allowable pressure.

(j) If it is desired to use materials other than those specified in this section, a request furnishing chemical and physical properties of the material which it is desired to employ shall be submitted to the Commandant for special consideration.

§ 55.07-5 Design pressures and thickness of pipes.

(a) (1) The maximum allowable pressure and minimum thickness of pipes shall be calculated by the following formulas:

$$P = \frac{2S\ (T-A)}{D-M\ (T-A)} \quad (1)$$

$$T = \frac{PD}{2S+MP} + A \quad (2)$$

where:

P = maximum allowable pressure, p. s. i.[1]

T = minimum wall thickness of pipe, inches.[2]

D = external diameter of pipe, inches.

S = Allowable fiber stress, p.s.i. When ferrous material is employed, the allowable fiber stress shall be 80 percent of the stresses as given in Table 52.05-10(a). When nonferrous material is employed, the allowable fiber stress shall be as given in Table 54.03-10(c).

M = Multiplier as given in Table 55.07-5(a).

A = Allowance for threading, grooving, and/or corrosion.

A = 0.05 inch for threaded pipe ¾ inch and below.

A = depth of thread h for threaded pipe 1 inch and above.

A = depth of groove for grooved pipe.

A = 0.05 inch for plain-end steel, wrought iron pipe or tubes, 1 inch size and smaller.

A = 0.065 inch for plain-end steel, wrought iron pipe or tubes, for sizes above 1 inch.

A = 0.00 inch for plain-end nonferrous pipe or tubes.

NOTE: The depth of thread h may be determined by the formula $h = 0.8/n$; where n = the number of threads per inch, or from the following values: $h = 0.100$ inch, 0.0696 inch, and 0.0571 inch, for 8, 11½, and 14 threads per inch, respectively. "Plain-end" includes pipe joined by flared compression couplings, lap joints, welding, etc., i. e., by any method that does not reduce the wall thickness of the pipe at the joint.

[1] When computing the allowable pressure for a pipe, the pipe wall thickness used in formula (1) shall not be more than the minimum thickness resulting from the application of mill tolerances prescribed in the applicable pipe specifications for the material to be employed, including tubing material when used for piping. For bent sections of pipe, the reduction in wall thickness due to fabrication, in addition to the mill tolerance, shall be subtracted from the nominal pipe wall thickness to obtain the minimum pipe wall thickness.

[2] The wall thickness to which the pipe or tubing is ordered shall not be less than the sum of the minimum wall thickness determined by formula (2), plus the mill tolerance, and the reduction in wall thickness due to bending.

TABLE 55.07-5 (a)—MULTIPLIER "M" VALUES[1]

Temperature ° F.	900 and below	950	1,000	1,050
Ferrous materials:				
Ferritic steels	0.8	1.0	1.4	1.4
Austenitic steels	0.8	0.8	0.8	0.8
Nonferrous materials	0.8	-----	-----	-----

[1] Intermediate values of "M" may be obtained by interpolation.

(2) The value of P in the formula shall not be taken at less than 150 p. s. i. for class I piping nor less than 50 p. s. i. for nonferrous class II piping; however, copper piping shall be of not less than 0.065 inch in thickness except for lines below 1 inch in diameter, nor shall ferrous material to be fabricated by welding be of a thickness less than 0.120 inch.

(b) (1) The design pressures of the steam piping connected to the boiler drum or to the superheater inlet header shall be not less than the highest pressure at which any drum safety valve is set to blow.

(2) The design pressure of the superheater outlet flange and the superheated steam piping beyond the superheater outlet shall be not less than the pressure at which the superheater safety valve is set to blow. Where the superheater safety valve is of the drum pilot actuated type, the design pressure shall be at least equal to 95 percent of the drum pilot safety valve setting. The S value for the material shall not exceed that permitted for the total steam temperature at the superheater outlet.

(c) Carbon steel or wrought iron pipe shall have a wall thickness of not less than standard weight pipe. Where the installation of light wall pipe is deemed satisfactory, the use of pipe having a wall thickness less than standard weight will be given special consideration by the Commandant.

(d) The outer walls of pipe bends after fabrication shall have a thickness of not less than that required by paragraph (a) of this section. If doubt exists as to the wall thickness being adequate, Class I piping having diameters exceeding 4 inches shall be drilled, gaged, and fitted with a screwed plug extending outside the pipe covering. Alternatively, a method of nondestructive examination such as the use of radiation measurement, ultrasonic or other acceptable method may be used. The nondestructive examination shall be employed where the design temperature exceeds 750° F. Prior to the use of nondestructive methods of examination by the above procedure, it shall be demonstrated by the user, in the presence of a marine inspector on specimens similar to those to be examined, that consistent results, having an accuracy of plus or minus 4 percent of the measurements secured by micrometers, are obtainable.

(e) The radius of a pipe bend measured from the centerline of the pipe shall be not less than three times the nominal pipe diameter, except for copper which shall have a radius of not less than twice the nominal pipe diameter.

(f) (1) Where pipe is pierced with tube holes the ligament efficiency of the tube holes shall be employed in the formulas in § 52.05-10 of this subchapter to determine the maximum allowable pressure of the piping. The pressure thus calculated shall in no case be greater than that allowed for the unpierced pipe.

(2) Where branch connections are welded to Class I piping, or to piping conveying steam at pressures exceeding 50 p. s. i., reinforcement of the pierced pipe shall be provided unless the connection is adequate for the design pressure. The amount of reinforcement required

shall be determined by § 52.25–20 of this subchapter.

(3) The longitudinal joint of a welded pipe shall not be pierced with holes.

(g) Sections of ferritic alloy steel piping shall be furnished in the full-annealed or normalized and drawn condition prior to installation. If the material is subject to hot bending or hot forming operations, the piping shall be re-normalized before welding. Following the normalizing treatment, piping over 2½ inches shall be re-drawn either before welding or after welding when a combined stress relief and drawn treatment may be performed simultaneously in the furnace. Material which is bent cold need not be re-normalized. The heat treatment of austenitic alloy steel piping subject to hot bending or other hot forming operations will receive special consideration by the Commandant. All scale shall be removed from normalized pipe prior to installation.

§ 55.07–6 Expansion and flexibility.

(a) Piping systems shall be designed to have sufficient flexibility to prevent thermal expansion or contraction from causing excessive stresses in the piping material, excessive bending moments at the joints, or excessive forces or moments at points of connection to equipment or at anchorage and guide points.

(b) Provision shall be made for expansion and contraction by changes in direction of pipe runs or by the use of expansion bends, loops, offsets, or movable joints that will provide adequate flexibility.

(c) Piping shall be installed to avoid excessive strains and shall be adequately supported by hangers or guides, so that the weight of the piping is not transmitted to valves and fittings, and the effects of vibrations, pitching and rolling of the vessel are minimized. Pipe supports shall be designed and arranged so as not to interfere with expansion and contraction of the piping and to insure that excessive forces and moments are not imposed on connected equipment. Anchors, pivots, and restraints shall be fabricated and installed to secure the desired points of piping in relatively fixed positions and freely permit expansion and contraction in opposite directions. Main junction points of piping subject to temperatures exceeding 450° F., which are not balance points, shall be fitted with fixed anchors. If considered as a balance point the junction point may be free to move in all directions, or may be guided to limit the movement in one or more directions if computations indicate excessive strain may occur in any of the branch pipes.

(d) A summary of the results of pipe stress calculations for the main and auxiliary steam piping where the design temperature exceeds 800° F., together with the arrangement piping drawings, shall be submitted for approval. Calculations shall be made in accordance with one of the recognized methods of stress analysis acceptable to the Commandant.

(e) Stress calculations shall be made to determine the magnitude and direction of the forces and moments at all terminal connections, anchor and junction points, as well as the resultant bending stress, longitudinal pressure stress, torsional stress, and combined expansion stress at all such points. The location of the maximum combined stress shall be indicated in each run of pipe between anchor points. Dimensional properties of pipe and fittings shall be based on nominal dimensions.

(f) (1) The combined expansion stresses shall be calculated by the following formula:

$$S_e = \sqrt{S_b^2 + 4S_t^2} \qquad (1)$$

where:

S_e = combined expansion stress, in pounds per square inch.

$S_b = \frac{iM_b}{Z}$ = resultant bending stress, in pounds per square inch.

$S_t = \frac{M_t}{2Z}$ = torsional stress, in pounds per square inch.

M_b = resultant bending moment, in inch-pounds.

M_t = torsional moment, in inch-pounds.

Z = section modulus of the pipe, cubic inches.

i = stress intensification factor (see § 55.07–6 (g)).

(2) The calculations for the combined expansion stress, S_e, shall be based on 100 percent of the thermal expansion, using the modulus of elasticity at room temperature (cold condition). No credit will be allowed for cold pull in computing the combined expansion stress.

(3) The combined expansion stress shall not exceed the allowable stress range as determined by the following formula:

$$S_A = 1.25S_c + 0.25S_h \qquad (2)$$

where:

S_A = allowable stress range, in p.s.i.

S_c = Allowable stress in cold condition, in p.s.i. (80 percent of S value given in Table 52.05–10(a) for piping material at 650° F.)

S_h = Allowable stress in hot condition, in p.s.i. (80 percent of S value give in Table 52.05–10(a) for piping materials at design temperatures.)

(4) The sum of the longitudinal stresses due to pressure, weight and other sustained external loadings shall not exceed S_h. Where the sum of these stresses is less than S_h, the difference between S_h and the sum may be added to the term 0.25 S_h in formula (2).

(g) Stress intensification factors for pipe bends and elbows, moduli of elasticity, and coefficients of thermal expansion shall conform to the values as specified in the American Standard Code for Pressure Piping (ASA B31.1).

(h) (1) The reactions in the hot condition, R_h, and cold condition, R_c, shall be calculated by the following formulas:

$$R_h = (1 - \tfrac{2}{3}C)\frac{E_h}{E_c}R \qquad (3)$$

$$R_c = CR \quad \text{or} \quad \left(1 - \frac{S_h}{S_e} \times \frac{E_c}{E_h}\right)R, \text{ whichever is greater.} \qquad (4)$$

The value $\frac{S_h}{S_e} \times \frac{E_c}{E_h}$ shall be less than unity.

where:

R_c and R_h = maximum reactions estimated to occur in the cold and hot conditions, respectively, pounds.

R = range of reactions obtained from the flexibility calculations corresponding to the full expansion range based on the modulus of elasticity at room temperature, pounds.

C = cold spring factor varying from zero for no cold spring to one for 100 percent cold spring.

S_e = maximum computed expansion stress.

E_c = modulus of elasticity in cold condition. (See § 55.07–6 (g).)

E_h = modulus of elasticity in hot condition. (See § 55.07–6 (g).)

(2) The reactions so computed shall not exceed the limits which the attached equipment can safely sustain.

(3) Cold spring may be taken into account in the calculations of the reactions in the hot and cold conditions: *Provided*, That, in the opinion of the Commandant, satisfactory provision is made to obtain the designed cold spring.

(i) Where it is desired to employ alloy steel pipe materials of better heat resistant properties than those specified in Part 51 of this subchapter, special consideration may be given by the Commandant for an increase in the maximum allowable stress range, if satisfactory evidence is furnished to establish the suitability of the material for the design temperature.

§ 55.07–8 Variations in pressures and temperatures.

(a) Superheater outlet flanges and superheated and desuperheated steam piping direct from the boiler shall be designed for not less than the maximum pressure and temperature to which they may be exposed in service under normal sustained operating conditions.

(b) Occasional increases in pressure and/or temperature are unavoidable and may be permitted without changing the normal design provided the corresponding stress in the pipe wall calculated by Formulas (1) and (2) of § 55.07–5 does not exceed 80 percent of the maximum allowable stress value given in Table 52.05–10(a) in § 52.05–10 of this subchapter for the actual expected temperature by more than the following allowance for the periods of duration indicated:

(1) Up to 15 percent increase above the S value during 10 percent of the operating period.

(2) Up to 20 percent increase above the S value during 1 percent of the operating period.

§ 55.07–10 Valves and fittings.

(a) All valves shall close with a right hand (clockwise) motion of the handwheels when facing the end of the valve stem. Valves shall be of the rising stem type preferably with the stem threads external to the valve body. Where operating conditions will not permit of such installations, the use of a non-rising stem valve will be permitted, provided indicators are fitted to show clearly whether same is opened or closed. Valves installed in cargo tanks of tank vessels are not required to be fitted with indicators.

(b) Valves of class I piping having diameters exceeding 2 inches shall have bolted, pressure seal, or breech lock bonnets and flanged or welding ends, except that socket type welding ends shall not be used where the diameter exceeds 2 inches. For diameters not exceeding 2 inches, screwed union bonnet valves or a type which will positively prevent the stem from screwing out of the body may be employed. Cast-iron valves with screwed-in or screwed-over bonnets are prohibited. Union bonnet type cast-iron valves shall have the bonnet ring made of steel, bronze or malleable iron.

(c) Valves, flanges, fittings and appurtenances shall be designed for the maximum pressure to which they may be subjected, but in no case shall the design pressure be less than 50 pounds per square inch. When butterfly or wafer type resilient seated valves are used for shell connections, the valve bodies shall be designed for 150 pounds per square inch. Large fabricated ballast manifolds connecting lines exceeding eight inches nominal pipe size may be designed for a pressure of not less than 25 pounds per square inch.

(d) Disks or disk faces, seats, stems and other wearing parts of valves shall be made of material possessing corrosion and heat-resisting qualities suitable for the service conditions to which they may be subjected.

(e) Valves, flanges, and fittings shall be marked in conformance with the requirements of MSS Standard SP–25–1960.[1]

(f) Plug cocks shall be constructed with satisfactory and positive means of preventing the plug from becoming loosened or removed from the body when the plug is operated. Cocks having plug locking arrangements depending on cotter pins are prohibited.

(g) Cocks shall be marked in a straight line with the body to indicate whether same are open or closed.

§ 55.07–15 Joints and flange connections.

(a) Flanged or butt-welded joints are required for Class I piping for diameters exceeding 2 inches, except as otherwise specified in this subchapter.

(b) Slip-on flanges in sizes not exceeding 2'' may be used without pressure limitations and for temperatures not exceeding 650 degrees F. Slip-on flanges in sizes exceeding 2'' may be used for pressures not exceeding the service pressure temperature ratings for the 300-pound ASA Standard and for temperatures not exceeding 650 degrees F. Screwed joints for Class I piping are not permitted for pipe diameters exceeding 2''.

(c) Forged or cast steel valves, flanges, and pipe fittings of the socket welding type, wherein the pipe is inserted into the socket and is secured by means of a strength fillet weld may be employed for pipe diameters not exceeding 2 inches for Class I piping and without diameter limitation for Class II piping.

(d) Valves, flanges and fittings may be attached to nonferrous pipe by means of soldering where the pressures do not exceed 10 pounds per square inch at 240° F. and 100 pounds per square inch at 150° F. For temperatures between 150° F. and 240° F. the pressure shall be proportionate. Silver brazing alloy shall be employed for temperatures and pressures exceeding the foregoing.

(e) (1) Flanges shall conform in strength at least to the dimensional standards listed in Table 55.07–15 (e1), except as otherwise specified in this subchapter.

TABLE 55.07–15(e1)—STANDARDS FOR FLANGED, BUTT-WELDING, AND SOCKET-WELDING VALVES, FITTINGS, AND PIPE FLANGES

Type	Pressure rating	Standard	Notes
Cast iron	125	ASA B16.1–1960	(1)
Do	250	ASA B16.2–1960	(2)
Bronze	150	ASA B16.24–1962	(3)
Do	300	ASA B16.24–1962	(3)
Steel	150	ASA B16.5–1961	(4)
Do	300	ASA B16.5–1961	(4)
Do	400	ASA B16.5–1961	(4)
Do	600	ASA B16.5–1961	(4)
Do	900	ASA B16.5–1961	(4)
Do	1,500	ASA B16.5–1961	(4)
Do	2,500	ASA B16.5–1961	(4)
Do		ASA B16.9–1958	(5)
Do		ASA B16.11–1946	(6)

[1] American Standard Cast Iron Pipe Flanges and Flanged Fittings, Class 125, published by the American Society of Mechanical Engineers, 345 East 47th St., New York, N.Y., 10017.

[2] American Standard Cast Iron Pipe Flanges and Flanged Fittings, Class 250, published by the American Society of Mechanical Engineers, 345 East 47th St., New York, N.Y., 10017.

[3] American Standard Brass or Bronze Flanges and Flanged Fittings, 150- and 300-lb., published by the American Society of Mechanical Engineers, 345 East 47th St., New York, N.Y., 10017.

[4] American Standard Steel Pipe Flanges and Flanged Fittings, published by the American Society of Mechanical Engineers, 345 East 47th St., New York, N.Y., 10017.

[5] American Standard Steel Butt-Welding Fittings, published by the American Society of Mechanical Engineers, 345 East 47th St., New York, N.Y., 10017.

[6] American Standard Steel-Socket Welding Fittings, published by the American Society of Mechanical Engineers, 345 East 47th St., New York, N.Y., 10017.

(2) (i) The adjusted service pressure-temperature ratings for steel pipe flanges and flanged valves and fittings shall conform to the ASA standards as listed in Table 55.07–15(e1), except as otherwise specified in this subchapter.

(ii) The pressure-temperature ratings specified in American Standard Steel Pipe Flanges and Flanged Fittings, ASA B16.5, require gaskets and flange facings conforming to the requirements of such standards. For flange facing-gasket combinations other than those specified in ASA B16.5, calculations shall be submitted indicating that the gaskets will result in no increase in bolt load or flange moment over those facing-gasket combinations specified in this paragraph. (For acceptable gasket dimensions and flange facings, see Figure 54.03–25(c1) of this subchapter and ASA B16.5.)

(f) Flanges shall be attached to the pipe by any method shown by figures 55.07–15 (f1) to 55.07–15 (f15), inclusive, or by any additional means that may be approved by the Commandant.

(1) *Figure 55.07–15(f1).* Flanges with screwed threads may be used for class I piping not exceeding 2 inches nominal pipe size. For class II piping, flanges with screwed threads may be used without diameter limitation.

(2) *Figure 55.07–15(f2).* 150-pound and 300-pound low-hubbed flanges with screwed threads plus the addition of a strength fillet weld of the size as shown may be used for Class I piping without diameter limitation for temperatures not exceeding 750 degrees F. The pressure shall not exceed the American Standard service pressure temperature rating as prescribed in Table 55.07–15(e1).

(3) *Figure 55.07–15(f3).* Slip-on flanges in sizes exceeding 2'' may be used for pressures not exceeding the service pressure temperature ratings for the 300-pound ASA standards and for temperatures not exceeding 650 degrees F. Slip-on flanges in sizes not exceeding 2'' may be used without pressure limitations and for temperatures not exceeding 650 degrees F.

(4) *Figure 55.07–15(f4).* Socket welding flanges may be used for class I piping of nominal pipe size not exceeding 2 inches. For class II piping, socket welding flanges may be used without diameter limitation.

(5) *Figure 55.07–15(f5)* Flanges machined from steel plate meeting the requirements of Subpart 51.22 may be used for Class II piping for pressures not exceeding 150 pounds per square inch and temperatures not exceeding 450° F. The machined flanges shall conform at least to the American Standard 150 pound flange dimensions.

(6) *Figure 55.07–15 (f6).* Steel plate flanges meeting the material and construction requirements listed in Figure 55.07–15 (f5) may be used for Class II piping for pressures not exceeding 150 pounds per square inch or temperatures not exceeding 650 degrees F. The flange shall be attached to the pipe as shown by Figure 55.07–15 (f6). The pressure shall not exceed the American Standard service pressure temperature rating as prescribed in Table 55.07–15(e1).

(7) *Figure 55.07–15 (f7).* Lap joint flanges (Van Stone) may be used for class I and class II piping. The Van Stone equipment shall be operated by qualified personnel and the ends of the pipe shall be heated from 1,650° F. to 1,900° F. dependent upon the size of the pipe prior to the flanging operation. The foregoing temperatures shall be carefully adhered to in order to prevent excess scaling of the pipe. The extra thickness of metal built up in the end of the pipe during the forming operation shall be machined to restore the pipe to its original diameter. The machined surface shall be free from surface defects and the back of the Van Stone lap shall be machined to a fine tool finish to furnish a line contact with the mating surface on the flange for the full circumference as close as possible to the fillet of the flange. The number of heats to be used in forming a flange shall be determined by the size of the pipe and not more than two push-ups per heat are permitted. The width of the lap flange shall be at least three times the thickness of the pipe wall

[1] The "Standard Marking System for Valves, Fittings, Flanges and Unions," is published by Manufacturers Standardization Society of the Valves and Fittings Industry, 420 Lexington Avenue, New York, N.Y., 10017.

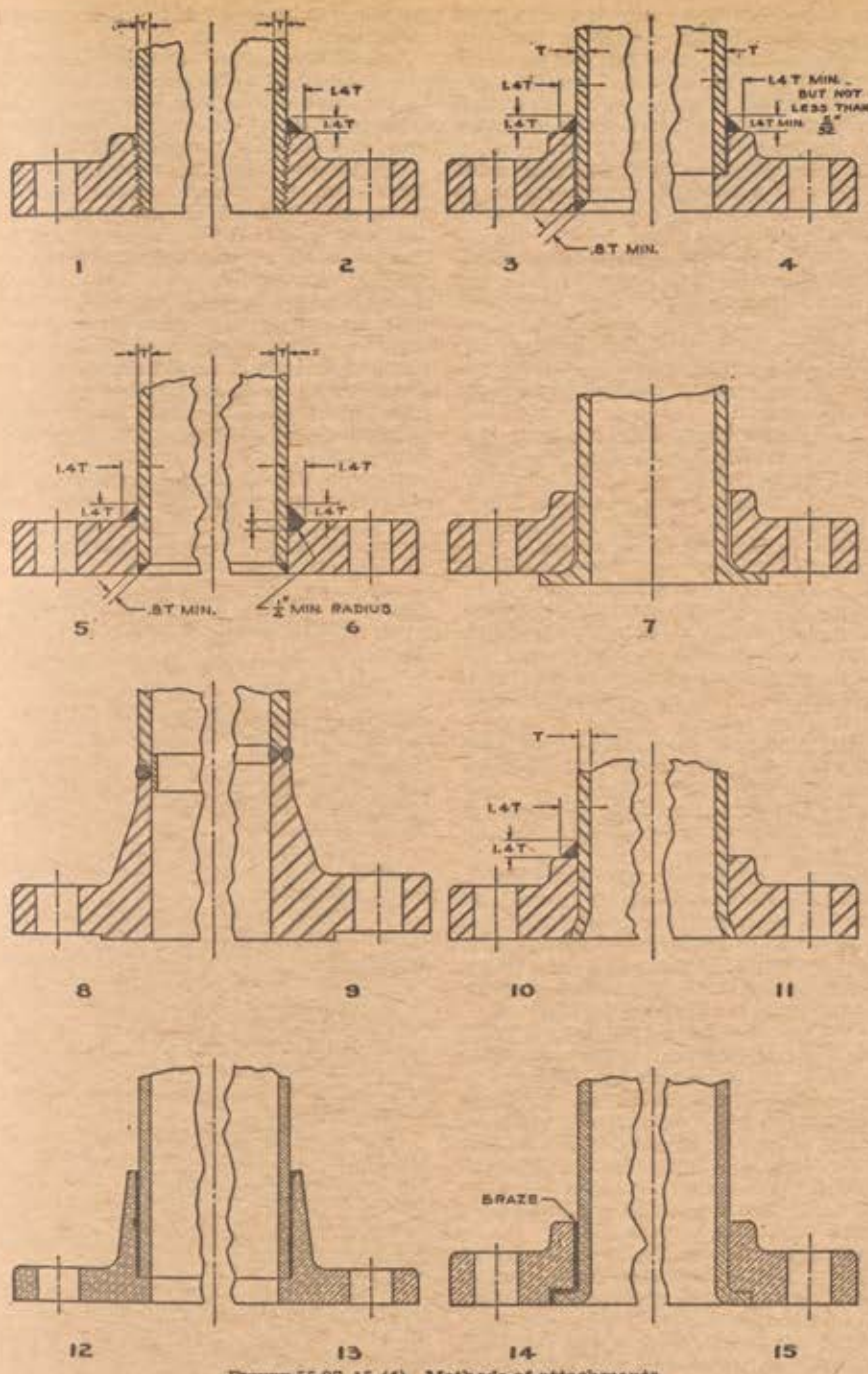


FIGURE 55.07-15 (f). Methods of attachments.

and the end of the pipe shall be properly stress-relieved after the flanging operation is completed. Manufacturers desiring to employ this type of joint shall demonstrate to an inspector that they have the proper equipment and personnel to produce acceptable lap joints.

(8) *Figure 55.07–15 (f8).* Welding neck flanges may be used on any piping provided the flanges are butt-welded to the pipe. The joint shall be welded as indicated by figure 55.07–15 (f8) and a backing ring employed which will permit complete penetration of the weld metal.

(9) *Figure 55.07–15 (f9).* Welding neck flanges may also be attached to pipe by a double-welded butt joint as shown by figure 55.07–15 (f9).

(10) *Figure 55.07–15 (f10).* Flanges may be attached by shrinking the flange on to the end of the pipe and flaring the end of the pipe to an angle or not less than 20°. A fillet weld of the size shown by figure 55.07–15 (f10) shall be used to attach the hub to the pipe. This type of flange is limited to a maximum pressure of 300 pounds per square inch at temperatures not exceeding 500° F.

(11) *Figure 55.07–15 (f11).* The flange of the type described and illustrated by figure 55.07–15 (f10), except with the fillet weld omitted, may be used for class II piping for pressures not exceeding 150 pounds per square inch and temperatures not exceeding 450° F.

(12) *Figure 55.07–15 (f12).* High-hub bronze flanges may be used for temperatures not exceeding 406° F. The hub of the flange shall be bored to a depth of not less than that required for a threaded connection of the same diameter leaving a shoulder for the pipe to butt against. A preinserted ring of silver brazing alloy having a melting point of not less than 1,000° F. and of sufficient quantity to fill the annular clearance between the flange and the pipe shall be inserted in the groove. The pipe shall then be inserted in the flange and sufficient heat applied externally to melt the brazing alloy until it completely fills the clearance between the hub and the flange of the pipe. A suitable flux shall be applied to the surfaces to be joined to produce a satisfactory joint. (For clearances of silver soldered joints, see § 56.10–30 (e) of this chapter.)

(13) *Figure 55.07–15 (f13).* The type of flange as described for figure 55.07–15 (f12) may be employed and in lieu of an annular groove being machined in the hub of the flange for the preinserted ring of silver brazing alloy, a bevel may be machined on the end of the hub and the silver brazing alloy introduced from the end of the hub to attach the pipe to the flange. (For clearances of silver soldered joints, see § 56.10–30 (e) of this chapter.)

(14) *Figure 55.07–15 (f14).* Flanges may be attached to nonferrous pipe by inserting the pipe in the flange and flanging the end of the pipe into the recess machined in the face of the flange to receive same. The width of the flange shall be not less than three times the pipe wall thickness. In addition thereto, the pipe shall be securely brazed to the wall of the flange.

(15) *Figure 55.07–15 (f15).* The flange of the type described and illustrated by figure 55.07–15 (f14), except with the brazing omitted, may be used for class II piping and where the temperature does not exceed 250° F.

§ 55.07–20 Bolting.

(a) Valves, fittings and flanges for piping systems shall have bolting complying with the standards for the different materials and pressure ratings as given in Table 55.07–15(e)(1). For the design requirements of bolted flanged connections on pressure vessels see § 54.03–25 of this subchapter.

(b) Bolting material shall comply with the requirements of § 54.03–25 of this subchapter.

§ 55.07–25 Installation.

(a) Slip joints shall not be used in cargo holds, deep tanks, and in other places that are not always accessible, except that they may be used in cargo lines of tank vessels. Where used, slip joints shall be provided with positive means for preventing the end of the pipe from pulling out of the joint.

(b) Pumps used to transfer oil shall have no discharge connections to firemains, boiler feed systems, or condensers unless approved positive means are pro-

vided to prevent oil from being accidentally discharged into any of the aforementioned systems.

(c) Where bilge or ballast piping are led through deep tanks means shall be provided to prevent the flooding of the compartments being served in the event of pipe leakage within the tanks. Such means may consist of an oiltight or watertight pipe tunnel, or the lines may be of Schedule 80 pipe thickness, fitted with expansion bends, and all joints within the tanks welded. Where a pipe tunnel is installed, the watertight integrity of the bulkheads shall be maintained and if the tunnel is not of sufficient size to afford easy access, no valve or fitting shall be located therein. Bilge lines led through deep tanks without a pipe tunnel shall be fitted with non-return valves at the bilge suctions.

(d) Where pipes and scuppers are carried through watertight or oiltight bulkheads, decks or tank tops, the watertight integrity of the structure shall be maintained. Lead or other heat sensitive materials shall not be used in piping systems which penetrate watertight subdivision bulkheads, where deterioration of such systems in the event of fire would impair the watertight integrity of the bulkheads. (For plastic pipe installations, see § 55.07–1(h).) Where plate insert pads are used, bolted connections shall have threads tapped into the plate to a depth of not less than the diameter of the bolt. If welded, the pipe or flange shall be welded to both sides of the plating. Openings in structure through which pipes pass shall be reinforced where necessary. Flanges shall not be bolted to bulkheads so that the plate forms a part of the joint.

(e) Piping shall not be run over or in the vicinity of switchboards or other electrical equipment if avoidable. When such leads are necessary, welded joints only shall be used and provision shall be made to prevent leakage from damaging the equipment.

(f) Fresh water piping shall not run through oil tanks nor oil piping through fresh water tanks. Care should be taken to prevent the accidental contamination of fresh water from salt water lines.

(g) Stuffing boxes shall not be used on deep tank bulkheads, double bottoms or in any position where they cannot be easily examined. This requirement does not apply to ore carriers operating on the Great Lakes or cargo lines of oil tankers.

(h) Piping systems shall be installed so that under no condition will the operation of safety or relief valves be impaired.

(i) (1) Remote valve controls which are not readily identifiable as to service shall be fitted with nameplates. Remote valve controls shall always be accessible under service conditions and an indicator shall be fitted to show whether the valve is open or closed. Valve control rods shall be adequately protected and only solid reach rods shall be used in tanks containing liquids, except that tank barges having plug cocks inside cargo tanks may have reach rods of extra heavy pipe with annular space between the lubricant tube and the pipe wall sealed with a non-soluble material to prevent penetration of the cargo.

(2) Where air operated remote control valves are installed, a self-indicating air cock and a pressure gauge or other acceptable means shall be provided in the actuating line to the remote valve as close as possible to the control board to indicate whether the remote control valve is open or closed.

(j) Suitable drains shall be provided at low points of piping systems.

(k) Valves and cocks shall be located so as to be easily accessible and valves or cocks attached to the shell of the vessel or to sea chests located below the floor plating shall be operable from above the floorplates.

(l) When welded fabrication is employed, a sufficient number of detachable joints shall be provided to facilitate overhauling and maintenance of machinery and appurtenances. The joints shall be located so that adequate space is provided for welding, and the location of the welds shall be indicated on the plans.

(m) (1) Pipes piercing the collision bulkhead shall be fitted with screwdown valves operable from above the bulkhead deck and the valve shall be secured to the bulkhead fitting inside the forepeak tank.

(2) Passenger vessels shall not have the collision bulkhead pierced below the margin line by more than one pipe conveying liquids in the forepeak tank except as provided for in subparagraph (3) of this paragraph.

(3) If the forepeak tank is divided to hold two different kinds of liquids, the collision bulkhead may be pierced below the margin by two pipes, provided there is no practical alternative to the fitting of the second pipe and further provided the safety of the vessel is maintained.

(n) Valves and cocks not forming part of a piping system are not permitted in watertight subdivision bulkheads.

(o) (1) Piping systems which may be subjected to pressures exceeding that for which same are designed shall be provided with a pressure reducing valve, and on the low pressure side of the reducing station a relief valve and pressure gauge shall also be installed.

(2) The relief valves installed on reduced pressure lines shall have a relieving capacity at least equal to the capacity of the pressure reducing valve at a pressure of not more than the design pressure of the reduced pressure piping or any appurtenance thereof, whichever is the lesser.

(p) Fuel oil service, cargo and fuel oil transfer and boiler feed pumps shall be provided with a pressure gauge. Relief valve shall also be installed in the discharge line provided the piping system or appurtenances are not designed for the pressure which such pumps are capable of developing when operating under shutoff head.

(q) Valves for fuel oil equalizing lines in machinery spaces shall comply with § 55.10–35 (d). Where flooding equalizing cross-connections are required for stability considerations, the arrangement shall be approved by the Commandant.

(r) Where pipes are run through cargo spaces and coal bunkers, they shall be substantially incased to protect them from mechanical injury. In coal bunkers such casings shall be made of steel.

(s) Piping, including valves, pipe fittings and flanges, conveying vapors, gases or liquids whose temperature exceeds 150 degrees F. shall be suitably insulated where necessary to preclude injury to personnel.

(t) Piping conveying oil shall be run well away from hot surfaces wherever possible. Where such leads are unavoidable, welded joints only shall be used, or alternatively suitable shields shall be fitted in the way of flanged or mechanical pipe joints when welded joints are not practicable.

(u) Oil piping drains, strainers, and other equipment subject to normal oil leakage shall be fitted with drip pans or other means to prevent oil draining to the bilge.

Subpart 55.10—Pumping Arrangements and Piping Systems

§ 55.10–1 Steam and exhaust piping.

(a) Steam stop valves in sizes exceeding six inches shall be fitted with bypasses for heating the line and equalizing the pressure before the valve is opened.

(b) In multiple boiler installations, the steam stop valves shall be of the stop check type.

(c) Main and auxiliary steam stop valves shall be arranged to seat against boiler pressure.

(d) Where vessels are equipped with more than one boiler, the auxiliary steam piping shall be so arranged that steam for the whistle, steering gear, and electric-lighting plant may be supplied from any power boiler.

(e) Steam and exhaust pipes shall not be led through coal bunkers or dry cargo spaces unless approved by the Commandant.

(f) Steam piping with the exception of the steam heating system shall not be led through passageways, crew and passenger quarters, or public spaces unless the arrangement is approved by the Commandant. Steam pressure for space heating shall not exceed 45 p. s. i.

(g) (1) Where positive shutoff valves are fitted in exhaust lines of machinery, and the exhaust side, including engine steam cylinders and chests, turbine castings, exhaust piping and shutoff valves is not designed for the maximum inlet pressure, a full capacity relief valve shall be fitted between the machinery exhaust and the shutoff valve. The relief valve shall be of sufficient capacity and so set to prevent the equipment from being accidentally or otherwise subjected to a pressure in excess of its design pressure.

(2) A sentinel relief valve or other warning device fitted on the engine or turbine exhaust together with a back pressure trip device which will close the inlet valve when the exhaust side of the system is subjected to pressures exceeding the design pressure, may be substituted for the required relief valve.

(h) Control and instrument piping led from superheated steam lines shall be so arranged as to preclude an appreciable amount of condensate from entering the superheated steam line in order to minimize the likelihood of cracking due to thermal shock.

(i) Steam shore connections shall be fitted with a relief valve set at a pressure not exceeding the design pressure of the piping.

§ 55.10–5 Safety and relief valve escape piping.

(a) Escape piping from the boiler drum and superheater safety valves shall have an area of not less than that of the combined areas of the outlets of all valves discharging thereto and shall be led as near vertical as practicable to atmosphere.

(b) Expansion joints or flexible pipe connections shall be fitted in escape piping. The piping shall be adequately supported and installed so that no stress is transmitted to the safety valve body.

(c) Safety or relief valve discharges, when permitted to terminate in the machinery space, shall be led below the floorplates or to a remote position to minimize the hazardous effect of the escaping steam.

§ 55.10–10 Boiler feed piping.

(a) *General requirements.* (1) Steam vessels, and motor vessels fitted with steam driven electrical generators, shall have at least two separate means of supplying feed water for the boilers. All feed pumps shall be fitted with the necessary connections for this purpose. The arrangement of feed pumps shall be in accordance with paragraph (d) or (e) of this section.

(2) Feed pump supply to power boilers may utilize the group feed system or the unit feed system.

(3) Feed discharge piping shall be designed for not less than either (i) 125 percent of the maximum allowable pressure of the boiler; or (ii) the feed pump relief valve setting, or shutoff head when a pump relief valve is not fitted; whichever is the greater.

(4) Feed pumps for water tube boilers shall have fresh water connections only.

(b) *Feed valves.* (1) Stop and stop-check valves shall be fitted in the main feed line and shall be attached as close as possible to the drum feed inlet nozzles or to the economizer feed inlet nozzles on boilers fitted with integral economizers.

(2) Where the installation will not permit the feed stop valve to be attached directly to the drum inlet nozzle on boilers not fitted with economizers, a distance piece may be installed between the stop valve and the inlet nozzle.

(3) Feed stop or stop-check valves may be located near the operating platform on boilers fitted with economizers provided the piping between the valves and the economizer, exclusive of the feed valves and the economizer inlet nozzles, is installed without intervening flanged connections and all butt-welded joints 4 inches and above in size are completely radiographed.

(4) Auxiliary feed lines shall be fitted with stop valves and stop-check valves. Boilers not having auxiliary feed water nozzles, or where independent auxiliary feed lines are not installed, shall have the auxiliary feed line to the drum or economizer connected to the main feed line as close as possible to the main feed stop valves; and the valves in the auxiliary feed line shall be fitted as close as possible to the junction point.

(5) Boilers fitted with economizers shall have a check valve fitted in the economizer discharge and located as close as possible to the drum feed inlet nozzle. When economizer by-passes are fitted, a stop-check valve shall be installed in lieu of the aforementioned check valve.

(6) A sentinel valve shall be fitted to an economizer when a valved bypass is installed.

(c) *Feed-water regulators, feed-water heaters and grease extractors.* (1) Feed-water regulators, tubular feed-water heaters, and grease extractors, where installed, shall be fitted with bypasses.

(2) Feed-water regulators designed with a built-in bypass for emergency use need not be fitted with an external by-pass when installed in a feed system provided with an auxiliary feed line. All feed-water regulators installed in a unit feed system shall be fitted with an external bypass. Feed-water regulator bypasses shall be so arranged that the regular feed valves are in operation while the bypass is in use.

(3) A feed-water regulator may be interposed between the stop and stop-check valves in the feed lines.

(d) *Group feed system.* Group feed systems shall be provided with pumps and piping as follows:

(1) Oceangoing and Great Lakes steam vessels, having a feed pump attached to the main propelling unit, shall be provided with at least one independently driven feed pump. Each of these pumps shall be used exclusively for feed purposes and shall be capable of supplying the operating boilers at their normal capacity. In addition, a second independently driven pump, capable of supplying such boilers at 75 percent of their normal capacity, shall be provided for emergency use. This second pump may be used for other purposes.

(2) If two independently driven pumps are provided, each capable of supplying the boilers at their normal required operating capacity, and neither of which is used for other purposes, the third or emergency feed pump is not required. Where more than two independently driven feed pumps are provided, their aggregate capacity shall not be less than 200 percent of that demanded by the boilers at their required normal operating capacity.

(3) River or harbor steam vessels shall have at least two means for feeding the boilers; one of which shall be an independently driven pump, the other may be an attached pump, an additional independently driven pump, or an injector.

(e) *Unit feed system.* Unit feed systems shall be provided with pumps and piping as follows:

(1) The unit feed system may be used on vessels having two or more boilers. When the unit feed system is employed each boiler shall have its own independently driven main feed pump capable of supplying the boiler at its normal operating capacity. In addition there shall be an auxiliary independently driven feed pump of the same capacity which can be operated in place of and in conjunction with the main feed pump. In vessels with two boilers there shall be provided one auxiliary pump for each boiler. In vessels with three or more boilers, not more than two boilers may be served by any one auxiliary pump. The auxiliary pump may be so interconnected that any pump can feed any boiler.

(2) In the unit feed system, a separate feed line shall be provided for each boiler from its pumps. A separate auxiliary feed line is not required. The discharge from each pump and the feed supply to each boiler shall be automatically controlled by the level of the water in that boiler. In addition to the automatic control, manual control shall be provided.

§ 55.10–13 Condensate pumps.

Two means shall be provided for discharging the condensate from the main condenser, one of which shall be independent of the main propelling machinery. If one of the independent feed pumps is fitted with a direct suction from the condenser and a discharge to the feed tank, same will be acceptable for this purpose. On vessels operating on lakes (including Great Lakes), bays, sounds, or rivers, where provision is made to operate noncondensing, only one condensate unit will be required.

§ 55.10–15 Blowoff piping.

(a) Where blowoff valves are connected to a common discharge from two or more boilers, a non-return valve shall be provided in the line from each boiler to prevent accidental blow-back in the event the boiler blowoff valve is left open.

(b) Blowoff piping external to the boiler shall be designed for not less than 125 percent of the maximum allowable pressure of the boiler.

(c) Boiler blowoff piping which discharges above the load line of a vessel shall be arranged so that the discharge is deflected downward.

(d) Valves such as the globe type so designed as to form pockets in which sediment may collect shall not be used for blowoff service.

§ 55.10–20 Circulating pumps.

(a) A main circulating pump and emergency means for circulating water through the main condenser shall be provided. The emergency means may consist of a connection from an independent power pump fitted between the main circulating pump and the condenser.

(b) Independent sea suctions shall be provided for the main circulating and the emergency circulating pumps.

(c) A cross connection between the circulating pumps in the case of multiple

units will be acceptable in lieu of an independent power pump connection.

(d) On vessels operating on lakes (including Great Lakes), bays, sounds, or rivers, where provision is made to operate noncondensing, only one circulating unit will be required.

§ 55.10-25 Bilge and ballast piping.

(a) (1) All vessels except unmanned barges shall be provided with a satisfactory bilge pumping plant capable of pumping from and draining any watertight compartment except for ballast, oil and water tanks which have acceptable means for filling and emptying, independent of the bilge system. The bilge pumping system shall be capable of operation under all practicable conditions after a casualty whether the ship is upright or listed. For this purpose wing suctions will generally be necessary except in narrow compartments at the ends of the vessel, where one suction may be sufficient. In compartments of unusual form, additional suctions may be required.

(2) Arrangements shall be made whereby water in the compartments will drain to the suction pipes. Efficient means shall be provided for draining water from all tank tops, other watertight flats and insulated holds. Peak tanks, chain lockers and decks over peak tanks may be drained by eductors, ejectors or hand pumps. Where piping is led through the forepeak, see § 55.07-25(m).

(3) Where drainage from particular compartments are considered undesirable, the provisions for such drainage may be omitted, provided it can be shown by calculations that the safety of the vessel will not be impaired.

(b) Passenger vessels shall have provision made to prevent the compartment served by any bilge suction piping from being flooded in the event the pipe is severed or otherwise damaged by collision or grounding in any other compartment. Where the piping is located within one-fifth of the beam of the side of the vessel[1] or in a ductkeel, a nonreturn valve shall be fitted to the end of the pipe in the compartment which it serves.

(c) (1) Bilge suctions shall be led from manifolds, which shall be controlled above the floor plating in the compartments in which they are located, and shall be easily accessible at all times. Except as otherwise permitted by paragraph (i) of this section for Great Lakes' cargo vessels employing a common bilge and ballast system for the cargo spaces, valves in the machinery space controlling bilge suctions from various compartments shall be of the stop-check type.

(2) Passenger vessels engaged on international voyages shall have the manifolds and valves in the bilge pumping system so arranged that in the event of flooding, one of the bilge pumps can take suction on any compartment; and in addition, damage to a pump or its pipe connecting to the bilge main outboard of a line drawn at one-fifth of the beam of the vessel shall not put the bilge system out of action.

(3) If a bilge system common to all pumps is installed on passenger vessels engaged on international voyages, the necessary valves for controlling the bilge suctions shall be operable from above the bulkhead deck. If, in addition to the main bilge pumping system, an emergency bilge pumping system is installed, it shall be independent of the main system and so arranged that a pump is capable of operating on any compartment under flooding conditions. In such cases, only the valves necessary for the operation of the emergency bilge system need be capable of being operated from above the bulkhead deck.

(d) The internal diameter of bilge suction pipes shall be determined by the following formulas, except that the nearest commercial size not more than one-fourth inch under the required diameter may be used.

(1) For suctions to each main bilge pump:

$$d=1+\sqrt{\frac{L\ (B+D)}{2,500}} \qquad (1)$$

(2) For branch suctions to cargo and machinery spaces:

$$d=1+\sqrt{\frac{c\ (B+D)}{1,500}} \qquad (2)$$

where:

L = length of vessel, in feet on load waterline.
B = breadth of vessel, in feet.
D = molded depth to bulkhead deck, in feet.
c = length of compartment, in feet.
d = required internal diameter of suction pipe, in inches.

NOTE: For tankers L may be reduced by the combined length of the cargo oil tanks.

(3) For vessels of 150 gross tons and over, no main suction piping shall be less than 2½ inches internal diameter. Branch piping need not be more than 4 inches and shall not be less than 2 inches in diameter except for drainage of small pockets or spaces in which case 1½ inch diameter may be used. For vessels less than 150 gross tons no bilge suction shall be less than 1½ inches internal diameter and no branch piping shall be less than one inch nominal pipe size.

(4) For vessels of 65 feet in length or less and not engaged on an international voyage, the bilge pipe sizes computed by formulas (1) and (2) of this paragraph are not mandatory, but in no case shall the size be less than 1 inch nominal pipe size.

(5) The number, location and size of bilge suctions in the boiler and machinery compartments shall be determined when the piping plans are submitted for approval and shall be based upon the size of the compartments and the drainage arrangements.

(e) One of the independent bilge pumps shall have a suction of a diameter not less than that given by formula (2) led directly from the engineroom bilge entirely independent of the bilge main, and on passenger vessels each independent bilge pump located in the machinery spaces shall have such direct suctions from these spaces, except that not more than two pumps are required to have direct suctions from any one space. Where two direct suctions are required in any one compartment on passenger vessels, one suction shall be located on each side of the compartment. If watertight bulkheads separate the engine and boiler rooms, a direct suction or suctions shall be fitted to each compartment unless the pumps available for bilge service are distributed throughout these compartments, in which case at least one pump in each such compartment shall be fitted with direct suctions in its compartment.

(f) (1) Main circulating pumps shall be fitted with direct suction connections provided with nonreturn valves in the machinery space. Great Lakes cargo vessels may have the emergency bilge suction connected to the largest available pump in the machinery space, provided it has a capacity not less than that of the main circulating pump. The diameter of such suction pipes shall be not less than two-thirds of the diameter of the main sea inlet. Where coal is used as fuel and no watertight bulkhead is provided between the engine and boiler rooms, a direct discharge overboard shall be fitted from at least one circulating pump, or a bypass may be fitted to the circulating discharge.

(2) Where the main circulating pump is not suitable for emergency bilge service, a direct emergency bilge suction shall be led from the largest available independent power driven pump to the drainage level of the machinery space. The suction shall be not less than the diameter of the main inlet of the pump used. The discharge capacity of the connected pump shall exceed the capacity of a required main bilge pump. The pump used for emergency bilge suction shall be in addition to the bilge pumps required by § 55.10-30, and the independent bilge suction(s) stipulated in paragraph (e) of this section.

(g) For internal-combustion engine installations, the emergency bilge suction shall be connected to the largest available pump in the engineroom and shall have an area equal to the full suction inlet of the pump. This requirement is in addition to the independent bilge suction stipulated in paragraph (e) of this section.

(h) Each individual bilge suction shall be fitted with a suitable bilge strainer having an open area of not less than three times that of the suction pipe. In addition a mud box or basket strainer shall be fitted in an accessible position between the bilge suction manifold and the pump.

(i) Pipes for draining cargo or machinery spaces shall be separate from pipes which are used for filling or emptying spaces where water or oil is carried. Bilge and ballast pumping systems shall be so arranged as to prevent oil or water from the sea or ballast spaces from passing into cargo or machinery spaces, or from passing from one compartment to another, whether from the sea, water

[1] Measured at right angles to the centerline at the level of the deepest subdivision load line or deep load line, where subdivision load line is not assigned.

ballast or oil tanks. The bilge and ballast mains shall be fitted with separate control valves at the pumps. The requirements of this paragraph do not apply to bilge and ballast systems on Great Lakes cargo vessels which may employ a common line for the bilge and ballast system for the cargo spaces.

(j) Ballast piping shall not be installed to any hull compartment of a wooden vessel. Where the carriage of liquid ballast in such vessels is necessary, suitable ballast tanks, structurally independent of the hull, shall be provided.

(k) When cargo is to be carried in deep tanks, arrangements shall be made for disconnecting or blanking-off the oil and ballast lines, and the bilge suctions shall be disconnected or blanked-off when oil or ballast is carried. Blind flanges or reversible pipe fittings may be employed for this purpose.

(l) When bilge pumps are utilized for other services, the piping shall be so arranged that under any condition at least one pump will be available for drainage of the vessel through an overboard discharge, while the other pump(s) are being used for a different service.

(m) All bilge pipes used in or under fuel storage tanks or in the boiler or machinery space, including spaces in which oil settling tanks or oil pumping units are located, shall be of steel or other acceptable material.

(n) Oily water separators, if installed as a means of meeting the requirements of § 74.15–10 of Subchapter H (Passenger Vessels), § 93.13–10 of Subchapter I (Cargo and Miscellaneous Vessels), or § 35.01–40 of Subchapter D (Tank Vessels) of this chapter, shall be of sufficient capacity to provide acceptable separation under the least favorable anticipated service conditions.

(Sec. 8, 75 Stat. 403; 33 U.S.C. 1007. Treasury Department Order 167–46, Nov. 6, 1961, 26 F.R. 10609)

§ 55.10–30 Bilge pumps.

(a) *Self-propelled vessels.* (1) All self-propelled vessels shall be provided with power pumps connected to the bilge main as required in table 55.10–30(a).

(2) On passenger vessels 300 feet or more in length engaged in international voyages, or on all passenger vessels on international voyages having a criterion numeral of 30 or more, one of the power bilge pumps shall be available at all times for use under emergency conditions in which a vessel may be flooded at sea. One of the following installations will be considered as complying with the requirements of this paragraph.

(i) One of the required bilge pumps is an emergency pump of a reliable submersible type, the source of power for which shall be located above the bulkhead deck; or,

(ii) The bilge pumps and their sources of power are located throughout the ship so that under any condition of flooding which the vessel is required to withstand, at least one pump will be available in an undamaged compartment.

(3) One of the required power bilge pumps may be attached to the propelling engine.

TABLE 55.10–30 (a)—POWER BILGE PUMPS REQUIRED FOR SELF-PROPELLED VESSELS

Vessel length	Passenger vessels			Dry cargo vessels		Tank vessels
	International voyage [1]	Ocean, coastwise, and Great Lakes	All other	Ocean, coastwise, and Great Lakes	All other	All
180 feet or more	[2] 3	[2] 3	2	3	2	2
Below 180 feet and exceeding 65 feet	[2] 3	[2] 2	[2] 2	[2] 2	[2] 2	2
65 feet or less	3	1	1	1	1	1

[1] Not applicable to passenger vessels which do not proceed more than 20 miles from the nearest land, or which are employed in the carriage of large numbers of unberthed passengers in special trades.
[2] When the criterion numeral exceeds 30, an additional independent power driven bilge pump is required. (See Subpart 73.10 of Part 73 of Subchapter H (Passenger Vessels) of this chapter for determination of criterion numeral.)
[3] Vessels operating on lakes (including Great Lakes), bays, sounds, or rivers where steam is always available, or where suitable water supply is available from a power pump of adequate pressure and capacity, syphons or eductors may be substituted for one of the required power pumps, provided a syphon or eductor is permanently installed in each hold or compartment.

(4) The bilges forward of the cargo tanks on tank ships may be drained by a power or hand pump, syphons, or eductors. If syphons or eductors are employed, the same shall be permanently installed in each compartment.

(5) On Great Lakes cargo vessels which do not employ a common bilge main, the pumps used for bilge suction are not required to be connected to a bilge main.

(b) *Nonself-propelled vessels.* (1) Oceangoing sailing vessels and barges shall be provided with pumps connected to the bilge main as required in table 55.10–30 (b).

TABLE 55.10–30 (b)—BILGE PUMPS REQUIRED FOR NON-SELF-PROPELLED VESSELS

Type of vessel	Waters navigated	Power [1] pumps	Hand pumps
Sailing	Ocean and coastwise	2	[3]
Manned barges	do	2	[3]
Unmanned barges	All	[3]	[3]

[1] Where power is always available, independent power bilge pumps shall be installed as required and shall be connected to the bilge main.
[2] Efficient hand pumps connected to the bilge main may be substituted for the power pumps. Where there is no common bilge main, one hand pump will be required for each compartment.
[3] Suitable hand or power pumps or siphons, portable or fixed, carried either on board the barge or on the towing vessel shall be provided.

(2) The pumps and source of power for operation on oceangoing sailing vessels and barges shall be located above the bulkhead deck or at the highest convenient level which is always accessible.

(c) *Capacity of independent power bilge pump.* Each power bilge pump shall have a capacity of developing a suction velocity of not less than 400 ft. per minute through the size of pipe required by § 55.10–25 under ordinary conditions, except that for vessels of less than 65 ft. in length not engaged on international voyages the pump shall have a minimum capacity of 25 gallons per minute and need not meet the velocity requirement of this paragraph.

(d) *Priming.* Suitable means shall be provided for priming centrifugal pumps which are not of the self-priming type.

(e) *Location.* (1) If the engines and boilers are in two or more watertight compartments, the bilge pumps shall be distributed throughout these compartments. When the location of bilge pumps in separate watertight compartments is not possible, the Commandant will consider alternate arrangements of the bilge pumps.

(2) The emergency bilge pumps shall not be installed in a passenger ship forward of the collision bulkhead.

(f) *Other pumps.* Sanitary, ballast, and general service pumps having the required capacity may be accepted as independent power bilge pumps if fitted with the necessary connections to the bilge pumping system.

§ 55.10–35 Fuel oil and cargo oil systems.

(a) Oil-piping systems for the transfer or discharge of cargo or fuel oil shall be separate from other piping systems as far as practicable, and positive means shall be provided to prevent dangerous interconnection in service.

(b) When it is necessary to heat the oil to facilitate its transfer, heating coils shall be properly installed in the tanks. The drains from the heating coils as well as the steam drains from oil heaters in the service system shall be run to an open inspection tank or other suitable oil detector before being returned to the feed tank.

(c) Filling pipes may be led directly from the deck into the tanks or to a manifold in an accessible location permanently marked to indicate tanks to which they are connected and from which the oil can be distributed to the various tanks through the piping system. The end of filling pipes shall be fitted with a shutoff valve which shall be kept closed when not in use. Alternate arrangements where gravity systems for filling are employed will be given special consideration by the Commandant.

(d) (1) Piping subject to internal head pressure from oil in the tank shall be fitted with positive shutoff valves located at the tank.

(2) Valves installed on the outside of the oil tanks shall be made of steel or nodular cast iron (Grade 60–45–15) and shall be arranged for local manual control at the valve and from a readily accessible and safe location outside of the compartment in which the valves are located.

(3) If valves are installed on the inside of the tank, they may be made of cast iron and arranged for remote con-

trol only, but additional valves for local control shall be located in the machinery space at the tanks. Valves for local control outside the tanks shall be made of steel or nodular cast iron (Grade 60–45–15).

(4) Remote operation for shutoff valves on small independent fuel-oil tanks will be specially considered in each case where the size of tanks and their location may warrant the omission of remote operating rods.

(e) Fuel oil tanks overhanging boilers are prohibited.

(f) Outlets for drawing fuel or draining water from the fuel oil system are not permitted in machinery spaces. Test cocks shall not be fitted to fuel or cargo oil tanks.

§ 55.10–40 Fuel oil service systems.

(a) All discharge piping from the fuel oil service pumps to the burners shall be of Schedule 80 seamless steel.

(b)(1) All vessels having oil fired power boilers shall have at least two fuel-oil service pumps each of sufficient capacity to supply all the boilers at full power, and arranged so that one may be overhauled while the other is in service. At least two fuel-oil heaters of approximately equal capacity shall be installed and so arranged that any heater may be overhauled while the other(s) are in service. Suction and discharge strainers shall be of the duplex or other type capable of being cleaned without interrupting the oil supply. Coamings, drip pans, etc. shall be fitted under fuel oil service pumps, heaters, etc. where necessary to prevent oil drainage to the bilge.

(2) All auxiliary boilers, except those furnishing steam for vital equipment and fire-extinguishing purposes other than duplicate installations, may be equipped with a single fuel-oil service pump and single fuel-oil heater, and in addition such pumps need not be fitted with discharge strainers.

(3) Boilers burning fuel oils of low viscosity need not be equipped with fuel oil heaters, provided acceptable evidence is furnished to indicate that satisfactory combustion will be obtained without the use of heaters.

(c) Piping between service pumps and burners shall be located so as to be readily observable. The relief valve located at the pump and the relief valves fitted to the fuel-oil heaters shall discharge back into the fuel supply tank or the suction side of the pump. The return line from the burners shall be so arranged that the suction piping cannot be subjected to discharge pressure.

(d) If screwed-bonnet valves are employed, same shall be of the union-bonnet type capable of being packed under pressure.

(e) Unions shall not be used for pipe diameters of one inch and above.

(f) Bushings and street ells are not permitted in fuel oil discharge piping.

(g) Service oil pumps shall be equipped with means of control from a readily accessible position outside of the boiler room which will always be accessible in the event of fire occurring in the compartment in which the pumps are located.

§ 55.10–45 Gasoline fuel systems.

(a) *Material.* (1) Fuel supply piping to the engines shall be of seamless drawn annealed copper tubing or iron pipe size copper pipe.

(2) Tubing wall thicknesses shall not be less than that shown in Table 55.10–45 (a).

TABLE 55.10-45 (a)—TUBING WALL THICKNESS

Outside diameter of tubing in inches	Thickness	
	B. W. G.	Inch
⅛, 3/16, ¼	#21	0.032
5/16, ⅜	#20	.035
7/16, ½	#19	.042

(3) Tubing fittings shall be of nonferrous drawn or forged metal and of the flared type. Tubing shall be cut square and flared by suitable tools. Tube ends shall be annealed before flaring. Pipe fittings shall be of nonferrous material. Pipe thread joints shall be made tight with a suitable compound.

(4) Valves for fuel lines shall be of nonferrous material of the union-bonnet type with ground seats. Cocks are prohibited for use in gasoline fuel lines.

(b) *Installation.* (1) All fuel pipes, pipe connections and accessories shall be readily accessible. The piping shall run in sight wherever practicable, protected against mechanical injury, and effectively secured against excessive movement and vibration by the use of soft nonferrous metal liners or straps without sharp edges. Where passing through steel decks or bulkheads, fuel lines shall be protected by close fitting ferrules or stuffing boxes.

(2) A short length of suitable metallic or nonmetallic flexible tubing or hose, or a loop of copper tubing shall be installed in the fuel supply line at or near the engine to prevent damage by vibration. A nonmetallic flexible hose fabricated of a synthetic rubber adequately reinforced with either a suitable fabric or wire may be used for this purpose. The hose shall be designed for high resistance to petroleum oils, heat and vibration. Flexible hose connections should maintain metallic contact between the sections of the fuel supply lines; however, if such contact is not maintained, the fuel tank shall be grounded.

(3) Valves in fuel lines shall be installed to close against the flow.

(c) *Shutoff valves.* Shutoff valves of a suitable type shall be installed in the fuel supply lines, one as close to each tank as practicable, and one as close to each carburetor as practicable. Where fuel tanks are installed below the weather deck, arrangements shall be provided for operating all shutoff valves at the tanks from outside the compartments in which they are located, preferably from an accessible position on the weather deck. The operating gear for the shutoff valves at the tanks shall be accessible at all times.

(d) *Strainers.* A suitable twin strainer shall be fitted in the fuel supply line in the engine compartment. Strainers shall be of the type opening on top for cleaning screens. A drip pan shall be fitted under the strainer.

(e) *Outlets and drains.* Outlets in fuel lines for drawing gasoline for any purpose are prohibited. Valved openings in the bottom of fuel tanks are prohibited, however, openings fitted with threaded plug or cap may be used for cleaning purposes.

(f) *Fuel suction connections.* All fuel suction and return lines shall enter the top of the fuel tanks and connections shall be fitted into spuds. Such lines shall extend nearly to the bottom of the tank.

(g) *Filling and sounding pipes.* Filling and sounding pipes shall be so arranged that vapors or possible overflow when filling cannot escape to the inside of the vessel but will discharge overboard. Such pipes shall terminate on the weather deck clear of any coamings and shall be fitted with suitable shutoff valves or deck plugs. Filling and sounding pipes shall extend to within one-half of their diameter from the bottom of the tank or from the surface of the striking plate in case of a sounding pipe. A flame screen of noncorrodible wire mesh shall be fitted in the throat of the filling pipe. Sounding pipes shall be kept closed at all times except during sounding.

(h) *Vent pipes.* Each tank shall be fitted with a vent the net cross-sectional area of which shall be not less than that of the filling pipe. The vent pipes shall terminate at least two feet above the weather deck and not less than three feet from any opening into living quarters or other below deck space. The ends of vent pipes shall terminate with U-bends and shall be fitted with flame screens or flame arresters. The flame screens shall consist of a single screen of corrosion resistant wire of at least 30 x 30 mesh.

(i) *Gasoline tanks.* For requirements pertaining to gasoline tanks, see Subpart 59.05 of this subchapter.

§ 55.10–50 Diesel fuel system.

(a) *Scope.* The regulations in this section apply to motorboats and motor vessels of less than 100 gross tons and tank barges. For all other vessels, the diesel fuel system shall comply with §§ 55.10–35, 55.10–60 and 55.10–65.

(b) *Material and workmanship.* Fuel supply piping shall be of seamless steel or annealed seamless copper or brass pipe or tubing.

(c) *Installation.* The installation of diesel fuel piping shall comply with the requirements of § 55.10–45(b).

(d) *Shutoff valves.* Shutoff valves shall be installed in the fuel supply lines, one as close to each tank as practicable, and one as close to each fuel pump as practicable. Valves shall be accessible at all times.

(e) *Outlets and drains.* Valves for removing water or impurities from fuel oil systems will be permitted in the machinery space provided such valves are fitted with caps or plugs to prevent leakage.

(f) *Filling pipe.* Tank filling pipes on motorboats and motor vessels of less than

100 gross tons and tank barges shall terminate on an open deck and shall be fitted with suitable shutoff valves, deck plugs, or caps.

(g) *Vent pipes.* Each tank shall be fitted with a vent pipe complying with § 55.10–45 (h).

(h) *Diesel fuel tanks.* For requirements pertaining to diesel fuel tanks see Subpart 59.10 of this subchapter.

§ 55.10–55 Lubricating oil system.

(a) The lubricating oil system shall be designed to function satisfactorily when the vessel is permanently inclined to an angle of 15 degrees athwartship and 5 degrees fore or aft.

(b) When pressure or gravity forced lubrication is employed for the steam driven main propelling machinery, an independent auxiliary lubricating pump shall be provided.

(c) Oil coolers on steam driven machinery shall be provided with two separate means of circulating water through the coolers.

(d) For internal combustion engine installations, the requirements of paragraphs (b) and (c) of this section shall be met but do not apply to vessels in river and harbor service, nor in any vessel below 300 gross tons. Where the size and design of an engine is such that lubrication before starting is not necessary and an attached pump is normally used, the independent auxiliary pump is not required if a duplicate of the attached pump is carried as spare. Oil filters shall be provided on all internal combustion engine installations, and on main propulsion engines which are fitted with full-flow type filters the arrangement shall be such that the filters may be cleaned without interrupting the oil supply.

(e) The lubricating oil piping shall be independent of other piping systems and shall be provided with necessary coolers, heaters, filters, etc., for proper operation. Oil heaters shall be fitted with bypasses.

(f) Diesel engine lubrication systems shall be so arranged that vapors from the sump tank may not be discharged back into the engine crank case of engines of the dry sump type.

(g) Steam turbine driven propulsion and auxiliary generating machinery depending on forced lubrication shall be arranged to shut down automatically upon failure of the lubricating system.

§ 55.10–60 Vent piping.

(a) The structural arrangement in double bottom and other tanks shall be such as to permit the free passage of air and gases from all parts of the tanks to vent pipes.

(b) Tanks having a comparatively small surface, such as fuel oil settling tanks, need be fitted with only one vent pipe, but tanks having a comparatively large surface shall be fitted with at least two vent pipes. The vents shall be located so as to provide venting of the tanks under any service condition.

(c) Vent pipes for fuel oil tanks if not run vertically shall, wherever possible, be inclined not less than 30 degrees from the horizontal except on common headers where both ends are adequately drained to a tank.

(d) Vents of fresh water tanks shall extend above the weather deck unless same terminate within the machinery space, in which case they shall terminate well above the deep load line. Vents from ballast and fuel oil tanks shall extend above the weather deck and the vents from oil tanks shall terminate not less than 3 feet from any opening into living quarters.

(e) Vents from fuel oil and other tanks extending above the freeboard or superstructure deck shall be of substantial construction. The height from the deck to the opening at the inside of the return bend shall be at least 36 inches in wells on freeboard decks, 30 inches on raised quarter-decks and 18 inches on other superstructure decks, except on Great Lakes vessels where the height from the deck to the opening shall be, when practical, at least 30 inches in wells on freeboard decks, 24 inches on raised quarter-decks, and 12 inches on other superstructure decks. Where height of vent pipes on Great Lakes vessels may interfere with the working of the vessel a lower height may be approved provided the vent cap is properly protected. Satisfactory means are to be provided for closing the openings of the vents.

(f) Vent outlets from oil tanks shall be fitted with a single screen of corrosion-resistant wire, of at least 30 by 30 mesh, or two screens of at least 20 by 20 mesh, spaced not less than ½ inch nor more than 1½ inches apart. The clear area through the mesh shall not be less than the required area of the pipe. Satisfactory means shall be provided for closing the openings of vent pipes without damaging flame screens.

(g) The diameter of each vent pipe shall not be less than 1½ inches for fresh water tanks, 2 inches for water ballast tanks and 2½ inches for fuel oil tanks.

(h) Where tanks may be filled by a pressure head exceeding that for which the tank is designed, the aggregate area of the vents in each tank shall be at least equal to the area of the filling line unless the tanks are protected by overflows, in which case the area of the overflow shall not be less than that of the filling line.

(i) Where deep tanks are intended for the occasional carriage of dry or liquid cargo, a "spectacle" or ring and blank flange may be fitted in the overflow pipe so arranged as not to interfere with venting when the tanks contain oil.

§ 55.10–65 Sounding devices.

(a) All tanks shall be provided with a suitable means of determining liquid level. In lieu of sounding pipes, tanks for the carriage of Grade E or lower liquids which are separate from the hull may be provided with a reliable liquid level indicating device. Where such devices are attached to tanks for combustible liquids, they shall be of heat resistant materials, adequately protected from mechanical damage and shall be provided at the tank connections with devices which will automatically close in the event of rupture of the gage or gage lines. Except for main cargo tanks on tank vessels, all integral hull tanks and compartments, which are not at all times accessible under service conditions shall be fitted with sounding pipes.

(b) Where sounding pipes terminate below the freeboard deck on cargo vessels, same shall be fitted with gate valves, and on passenger vessels, where the valves terminate below the bulkhead deck, same shall be fitted with self-closing gate valves.

(c) The upper ends of sounding pipes terminating at the weather deck shall be closed by a screw cap or plug except that dry cargo carriers operating on the Great Lakes may have the sounding pipes which serve ballast water tanks terminate at least 4 inches above the deck and be closed by a tight fitting hinged cover making metal to metal contact with the hinge on the forward side. Positive means to secure these caps in the closed position shall be provided. No perforations or openings will be permitted throughout the length of a sounding pipe where fitted to oil tanks. Provision shall be made to prevent damage to the vessel's plating by the striking of the sounding rod.

§ 55.10–70 Overboard discharges and shell connections.

(a) (1) All inlets and discharges led through the vessel's sides shall be fitted with efficient and accessible means for preventing the accidental admission of water into the vessel in the event of fracture of such pipes.

(2) The number of scuppers, sanitary discharges, tank overflows, and other similar openings in vessel's sides shall be reduced to a minimum, either by making each discharge serve for as many as possible of the sanitary and other pipes, or in any other satisfactory manner.

(3) Where overboard discharges are led through the vessel's sides from spaces above the freeboard deck and are located not more than 18 inches below the freeboard deck and at least 24 inches above the deepest load line, the valves at the vessel's side as required by this section may be omitted.

(b) (1) Each separate overboard discharge led through the vessel's side from spaces below the freeboard deck, shall be provided with one automatic nonreturn valve fitted with a positive means of closing from above freeboard deck, or, alternatively, with two automatic nonreturn valves without positive means of closing, provided the upper valve is so located above the deepest load line as to be always accessible for examination under service conditions, and is of a type which is normally closed.

(2) Where a nonreturn valve with positive means of closing is fitted, the operating position above the freeboard deck shall always be readily accessible, and means shall be provided for indicating whether the valve is open or closed. Suitable arrangement shall be made to insure the valve not being closed by unauthorized persons and a notice shall be posted in a conspicuous place at the operating station to the effect that

the valve shall not be closed except as may be required in an emergency.

(c) All overflow pipes which discharge through the vessel's side shall be located as far above the deepest load line as practicable, and shall be provided with nonreturn valves located at the vessel's side. Where the overflows do not extend above the freeboard deck before discharging overboard, additional nonreturn valves shall be provided as required by paragraph (b) of this section, except that the two nonreturn valves shall always be used unless it is impractical to locate the upper valve in an accessible position, in which case the one nonreturn valve with positive means of closing will be acceptable.

(d) (1) Scuppers in the weather portions of decks shall be led overboard and scuppers in fully enclosed superstructures on the freeboard deck and lower decks shall be led to the bilges, unless they are led overboard and fitted with valves as required by paragraph (b) of this section. Where scuppers in partially enclosed superstructures lead overboard, they shall be fitted with nonreturn valves at the vessel's side; or, alternatively, they may be led to the bilges: *Provided*, That the scuppers are fitted with efficient and accessible means for closing in an emergency.

(2) Conditional upon the type and location of the inboard ends of sanitary and other similar discharges, the provisions of paragraph (b) of this section may be required as to discharges from spaces within enclosed superstructures.

(e) The inboard openings of ash and rubbish-chute discharges shall be fitted with efficient covers. If the inboard opening is located below the freeboard deck, the cover shall be watertight, and in addition, an automatic nonreturn valve shall be fitted in the chute in an easily accessible position above the deepest load line. Means shall be provided for securing both the cover and the valve when the chute is not in use. When ash ejectors or similar expelling devices located in the boilerroom have the inboard openings below the deepest load line, they shall be fitted with efficient means for preventing the accidental admission of water. The thickness of pipe for ash-ejector discharge shall be not less than that of extra strong pipe.

(f) Pump connections led through the vessel's sides below the freeboard deck shall be fitted with shutoff valves located as near the shell plating as practicable. The thickness of pipe for pump connections shall be not less than that of extra strong pipe.

(g) Where deck drains, soil lines, and sanitary drains discharge through the shell in way of cargo tanks on tank vessels, the valves required by this section shall be located outside the cargo tanks. The piping led through such tanks shall be fitted with expansion bends where required, and shall be of steel pipe having a wall thickness of not less than 5/8 inch, except that the use of suitable corrosion-resistant material of lesser thickness will be given special consideration by the Commandant. All pipe joints within the tanks shall be welded. Soil lines and sanitary drains which pass through cargo tanks shall be provided with non-return valves with positive means of closing or other suitable means for preventing the entrance of gases into living quarters.

(h) (1) Pipes terminating at the shell plating shall be fitted with bends or elbows between the outboard openings and the first rigid connection inboard. In no case shall such pipes be fitted in a direct line between the shell opening and the first inboard connection.

(2) Sea chests and overboard discharge fittings shall be of substantial construction and as short as possible.

(3) Sea chests shall be so located as to minimize the possibility of blanking off the suction.

(i) On new installations or replacements in vessels of 150 gross tons and over, malleable iron and non-ductile cast irons are not permitted for any connection to the shell plating below the freeboard deck nor shall such valves be secured to sea chests. Steel, bronze, or other approved ductile material shall be used. For this purpose, nodular cast iron, Grade 60–45–15, conforming to the requirements of Subpart 51.61 of Part 51 of this subchapter, may be used for shell connections below the freeboard deck and valves secured to sea chests. Lead or other heat sensitive materials shall not be used for pipes fitted outboard of shell valves in inlets or discharges, or in any other application where the deterioration of such pipes in the event of fire would give rise to danger of flooding.

(j) On passenger vessels where the bulkhead deck is higher than the freeboard deck, the requirements of this section shall be determined with respect to the bulkhead deck. For vessels not assigned load lines, such as certain inland vessels and barges, the weather deck shall be taken as the freeboard deck.

Subpart 55.13—Refrigeration Systems

§ 55.13–1 Scope.

The regulations in this subpart apply to fixed refrigeration systems. The requirements shall not apply to small, portable self-contained units.

§ 55.13–5 Design pressure.

The pressure vessels, compressors, piping, and controls shall be designed for the minimum pressures given in table 55.13–5.

TABLE 55.13–5—REFRIGERANT DESIGN PRESSURES

Refrigerant	Symbol	Design pressure	
		High side (p. s. i.)	Low side (p. s. i.)
Ammonia	(NH_3)	300	150
Carbon dioxide	(CO_2)	1,500	1,000
Freon-11	(CCl_3F)	30	30
Freon-12	(CCl_2F_2)	225	150
Freon-21	($CHCl_2F$)	70	40
Freon-22	($CHClF_2$)	[1] 300	[1] 150
Freon-113	($C_2Cl_3F_3$)	30	30
Freon-114	($C_2Cl_2F_4$)	50	50

[1] Permitted for watercooled installations only.

§ 55.13–10 Pressure vessels and piping.

(a) Each pressure vessel containing refrigerants, which may be isolated, shall be protected by a relief valve set to relieve at a pressure not exceeding the maximum allowable pressure. When a pressure vessel forms an integral part of a system having a relief valve, such vessel need not have an individual relief valve.

(b) Relief valves fitted on the high pressure side may discharge to the low pressure side before relieving to atmosphere. When relieving to atmosphere a relief valve shall be fitted in the atmospheric discharge connection from the receivers and condensers set to relieve at a pressure not greater than the maximum allowable pressure. A rupture disk may be fitted in series with the relief valve, provided the bursting pressure of the rupture disk is not in excess of the relief valve set pressure. Where a rupture disk is fitted on the downstream side of the relief valve, the relief valve shall be of the type not affected by back pressure.

(c) A relief valve shall be fitted on or near the compressor on the gas discharge side between the compressor and the first stop valve with the discharge therefrom led to the suction side.

(d) A check valve shall be fitted in the atmospheric discharge line if it is led through the side of the vessel below the freeboard deck, or a shutoff valve may be employed if it is locked in the open position.

(e) All piping materials shall be suitable for handling the primary refrigerant, brine, or fluid used, and shall be of such chemical and physical properties as to remain ductile at the lowest operating temperature.

§ 55.13–15 Tests.

(a) All pressure vessels, compressors, piping and direct expansion cooling coils shall be leak tested with gas after installation to their design pressures as required by § 55.13–5.

(b) No gas tests shall be made aboard ship higher than the design pressure of the part of the system being tested. The refrigerant in the system may be used for this test. If the refrigerant has been removed, oil pumped dry nitrogen or bone dry carbon dioxide with a detectable amount of the refrigerant added, should be used as a testing medium. (Carbon dioxide should not be used to leak test an ammonia system.) In no case should air, oxygen, any flammable gas or any flammable mixture of gases be used for testing.

Subpart 55.16—Liquefied Petroleum Gases for Cooking and Heating

§ 55.16–1 Scope.

(a) Liquefied petroleum gas may be used for cooking and heating on all vessels subject to inspection by the Coast Guard, except passenger vessels, provided the installation complies with the requirements of this subpart.

(b) It is the intent of the regulations in this subpart to permit liquefied petroleum gas systems of the vapor with-

drawal type only. Cylinders designed to admit liquid gas into any other part of the system are prohibited.

(c) All component parts of the system, except cylinders, appliances, and low pressure tubing, shall be designed to withstand a pressure of 500 pounds per square inch without rupture.

§ 55.16–5 Definition.

(a) For the purpose of this subpart the term "liquefied petroleum gas" means any liquefied flammable gas which is composed predominantly of hydrocarbons or mixtures of hydrocarbons, such as propane, propylene, butane, butylene, or butadiene, and which has a Reid[1] vapor pressure exceeding 40 pounds per square inch absolute at 100 degrees F.

§ 55.16–10 Approvals.

(a) *Gas appliances.* (1) All gas-consuming appliances used for cooking and heating shall be of a type approved by the Commandant, and shall be tested and approved for liquefied petroleum gas service by the American Gas Association and shall bear the approval seal of the American Gas Association Testing Laboratories.

(2) Continuous-burning pilot flames are prohibited for use on gas appliances when installed below the weather deck.

(3) Printed instructions for proper installation, operation, and maintenance of each gas-consuming appliance shall be furnished by the manufacturer.

(b) *Cylinders.* (1) Cylinders in which liquefied petroleum gas is stored and handled shall be constructed, tested, marked, maintained and retested in accordance with the regulations of the Interstate Commerce Commission.

(2) All liquefied petroleum gas cylinders in service shall bear a test date marking indicating that they have been retested in accordance with the regulations of the Interstate Commerce Commission.

(3) Regardless of the date of the previous test, a cylinder shall be rejected for further service when it leaks; when it is weakened appreciably by corrosion, denting, bulging or other evidence of rough usage; when it has lost more than 5% of its tare weight; or when it has been involved in a fire.

(c) *Safety relief devices.* All safety relief devices, where required, shall be approved as to type, size, pressure setting, and location, by the Bureau of Explosives in conformance with the regulations of the Interstate Commerce Commission.

(d) *Valves, regulators and vaporizers.* All component parts of the system, other than cylinders and low pressure distribution tubing between regulators and appliances, shall be tested and approved by and bear the label of the Underwriters Laboratories, Inc., or other recognized testing laboratory.

(e) *Plan approval.* Drawings in triplicate, showing the location and installation of all piping, gas-consuming appliances, cylinders, and other component parts of the system shall be submitted for approval.

§ 55.16–15 Valves and safety relief devices.

(a) Each cylinder shall have a manually operated screw-down shutoff valve fitted with handwheel installed directly at the cylinder outlet.

(b) All cylinders shall be protected by one or more safety relief devices complying with the requirements of § 55.16–10 (a). The safety relief device shall be a shutoff valve with an integral spring-loaded safety relief valve and supplementary fusible plug, the latter designed to yield when the cylinder has been emptied of liquid gas by the relief valve under conditions of exposure to excessive heat.

(c) Cylinder valves and safety relief devices shall have direct communication with the vapor space of the cylinder.

(d) In addition to the cylinder valve, a multiple cylinder system shall be provided with a two-way positive shutoff manifold valve of the manually operated type. The manifold valve shall be so arranged that the replacement of empty cylinders can be made without shutting down the flow of gas in the system.

(e) A master packless shutoff valve controlling all burners simultaneously shall be installed at the manifold of all gas-consuming appliances.

§ 55.16–16 Reducing regulators.

(a) All systems shall be provided with a regulating device so adjusted as to release gas to the distribution tubing at a pressure not in excess of 18 inches water column, or approximately 10.5 ounces per square inch.

(b) The low pressure side of all regulators shall be protected against excessive pressure by means of a suitable relief valve which shall be integral with the regulator. The relief valve shall be set to start to discharge at a pressure not less than two times and not more than three times the delivery pressure.

(c) All reducing regulators shall be fitted with a pressure gage located on the high pressure side of the regulator.

§ 55.16–17 Piping and fittings.

(a) The piping between the cylinders and the appliances shall be seamless annealed copper tubing or such other seamless tubing as may be approved by the Commandant.

(b) All high pressure tubing between the cylinders and the regulators shall have a minimum wall thickness of 0.049 inch. All low pressure tubing between the regulator and appliances shall have a minimum wall thickness of 0.032 inch.

(c) Tubing connecting fittings shall be of the flared type; or connections may be soldered or brazed with material having a melting point in excess of 1,000 degrees F.

§ 55.16–18 Installation.

(a) *Cylinders, regulating and safety equipment.* (1) Cylinders, regulating and safety equipment shall be installed in a substantially constructed and firmly fixed metal enclosure located on or above the weather deck. The cylinder enclosure shall have access from the weather deck only. The enclosure shall be provided with top and bottom ventilation consisting of a fresh air inlet pipe and an exhaust pipe both entering through the top of the cylinder housing. The enclosure shall be so constructed that when the access opening is closed, no gas can escape except through the ventilation system.

(2) Cylinders, regulating and safety devices shall be securely fastened and supported within the metal enclosure. The cylinders and high pressure equipment shall be so mounted as to be readily accessible and capable of easy removal for refilling and inspection. The stowage of high pressure equipment in the housing shall be such that the cylinder valves can be readily operated and the pressure gage dial be easily visible. Where possible, cylinders shall be mounted in an upright position.

(3) Stowage of unconnected spare cylinders, filled or empty, shall comply with the requirements for cylinders.

(4) All valves, manifolds and regulators shall be securely mounted in locations readily accessible for inspection, maintenance and testing, and shall be adequately protected.

(5) Discharge of the safety relief valves shall be vented away from the cylinder, and insofar as practicable, upward into the open atmosphere, but in all cases so as to prevent impingement of the escaping gas onto a cylinder.

(b) *Piping.* (1) All piping shall be installed so as to provide minimum interior runs and adequate flexibility. The piping at the cylinder outlets shall be fitted with flexible metallic connections to minimize the effect of cylinder movement on the outlet piping.

(2) Distribution lines shall be protected from physical damage and be readily accessible for inspection. Lines shall be substantially secured against vibration by means of soft nonferrous metal clips without sharp edges in contact with the tubing. When passing through decks or bulkheads, the lines shall be protected by ferrules of nonabrasive material. The distribution lines shall be continuous length of tubes from the regulator to the shutoff valve at the appliance manifold.

(c) *Gas-consuming appliances.* All gas-consuming appliances shall be permanently and securely fastened in place.

(d) *Electrical.* No electrical connections shall be made within the cylinder housing.

§ 55.16–19 Tests.

(a) *Installation.* (1) After installation, the distribution tubing shall be tested prior to its connection to the regulator and appliance by an air pressure of not less than 5 pounds per square inch.

(2) After satisfactory completion of the tests prescribed in subparagraph (1) of this paragraph, the distribution tubing shall be connected to the regulator and appliance and the entire system subjected to a leak test as required by § 55.16–30(j).

[1] As determined by the American Society for Testing Materials Standard D–323 (most recent revision)—Method of Test for Vapor Pressure of Petroleum Products (Reid Method).

(b) *Periodic.* Leak tests as required by § 55.16–30 (j) shall be conducted at least once each month and at each regular annual or biennial inspection. The tests required at monthly intervals shall be conducted by a licensed officer of the vessel or qualified personnel acceptable to the Officer in Charge, Marine Inspection. The owner, master, or person in charge of the vessel shall keep records of such tests showing the dates when performed and the name(s) of the person(s) and/or company conducting the tests. Such records shall be made available to the inspector upon request and shall be kept for the period of validity of the vessel's current certificate of inspection. Where practicable, these records should be kept in or with the vessel's logbook.

§ 55.16–20 Ventilation of compartments containing gas-consuming appliances.

(a) Compartments containing gas-consuming appliances which are located above the weather neck shall be fitted with at least two natural ventilator ducts led from atmosphere and extending to the floor level and to the overhead of the compartment. Mechanical ventilation may be used provided the motor is outside of the compartment.

(b) Where compartments in which gas-consuming appliances are located entirely below the weather deck, mechanical or power ventilation shall be provided with sufficient capacity to effect a change of air at least once every 6 minutes.

§ 55.16–25 Odorization.

(a) All liquefied petroleum gases shall be effectively odorized by an agent of such character as to indicate positively, by a distinctive odor, the presence of gas down to concentration in air of not over one-fifth the lower limit of combustibility.

§ 55.16–30 Operating instructions.

(a) Before opening a cylinder valve, the outlet of the cylinder shall be connected tightly to the system; and in the case where only a single cylinder is used in the system, all appliance valves and pilots shall be shut off before the cylinder valve is opened.

(b) Before opening cylinder valve after connecting it to system, the cylinder shall be securely fastened in place.

(c) When cylinders are not in use their outlet valves shall be kept closed.

(d) Cylinders when exhausted shall have their outlet valves closed.

(e) Nothing shall be stored in the metal enclosure except liquefied petroleum gas cylinders and permanently fastened parts of the system.

(f) Valve protecting caps, if provided, shall be firmly fixed in place on all cylinders not attached to the system. Caps for cylinders in use may remain in the cylinder enclosure if rigidly fastened thereto.

(g) The opening to the cylinder enclosure shall be closed at all times except when access is required to change cylinders or maintain equipment.

(h) Close master valve whenever gas-consuming appliance is not in use.

(i) No smoking is permitted in the vicinity of the cylinder enclosure when access to enclosure is open.

(j) Test system for leakage in accordance with the following procedure: With appliance valve closed, the master shut-off valve on the appliance open, and with one cylinder valve open, note pressure in the gage. Close cylinder valve. The pressure should remain constant for at least 10 minutes. If the pressure drops, locate leakage by application of liquid detergent or soapy water solution at all connections. Never use flame to check for leaks. Repeat test for each cylinder in a multicylinder system.

(k) Report any presence of gas odor to ----------

§ 55.16–35 Markings.

(a) The outside of the cylinder enclosure housing liquefied petroleum gas cylinders, valves and regulators shall be marked as follows:

Liquefied Petroleum Gas
Keep Open Fires Away.
Operating Instructions
Inside and In----

(b) A durable and permanently legible instruction sign covering safe operation and maintenance of the gas-consuming appliance shall be installed adjacent to the appliance.

(c) "Operating Instructions" as listed in § 55.16–30 shall be framed under glass, or other equivalent, clear, transparent material, in plainly visible locations on the outside of the metal enclosure and near the most frequently used gas-consuming appliance, so they may be easily read.

Subpart 55.17—Hydraulic Systems

§ 55.17–1 Scope.

(a) This part contains requirements for hydraulic power transmission systems and appurtenances.

(b) Hydraulic machinery may be accepted for installation on vessels subject to inspection provided the design material and fabrication comply with the applicable requirements of the American Bureau of Shipping or other recognized classification society.

§ 55.17–10 Design requirements.

(a) The pressure vessels, tubing, pipes and fittings shall be designed for the maximum operating pressure or not less than the relief valve setting.

(b) The system shall be so designed that proper functioning of any unit shall not be affected by the back pressure in the system. The design shall be such that malfunctioning of any unit in the system will not render any other connected or emergency system inoperative because of back pressure.

§ 55.17–15 Hydraulic fluid.

(a) The fluid used in hydraulic power transmission systems shall have a flash-point of not less than 200° F. for pressures below 150 pounds per square inch and 315° F. for pressures 150 pounds per square inch and above, as determined by ASTM Designation D–92–57, Cleveland "Open Cup" test method.

(b) The chemical and physical properties of the hydraulic fluid shall be suitable for use with any materials in the system or components thereof.

(c) The hydraulic fluid shall be suitable for operation of the hydraulic system through the entire temperature range to which it may be subjected in service.

§ 55.17–20 Tubing and pipes.

(a) Materials used in the manufacture of pressure vessels, tubing, pipe, flanges, fittings or bolting shall conform to the requirements of Part 51 subject to the limitations shown in Tables 52.05–10(a) and 55.07–1(b). SAE designated materials shall be evaluated on the basis of chemical and physical properties.

(b) Design pressures and thicknesses shall be calculated as required by § 55.07–5(a)(1), except that the allowance for threading, grooving and/or corrosion may be omitted when flared or flareless type tube fittings are used.

(c) All tubing and pipe materials shall be suitable for handling the hydraulic fluid used and shall be of such chemical and physical properties as to remain ductile at the lowest operating temperature.

§ 55.17–25 Hydraulic hose and fittings.

(a) Hose and fittings shall meet the requirements of § 55.07–1. Hose shall be complete with factory-assembled end fittings requiring no further adjustment, of the fittings on the hose, except that reusable type fittings may be used provided they are of the nipple and socket type in which the hose is securely attached to the fitting by compression of the hose.

(b) Hose assemblies may be installed between two points of relative motion but shall not be subjected to torsional deflection (twisting) under any conditions of operation and shall be limited, in general, to short lengths required for flexibility. Special consideration may be given to the use of longer lengths of flexible hose where required for proper operation of machinery and components in the hydraulic system.

(c) Hose assemblies shall be designed for a bursting pressure of not less than four times the maximum allowable pressure.

(d) Sharp bends in hose shall be avoided.

§ 55.17–30 Accumulators.

(a) An accumulator is an unfired pressure vessel in which energy is stored under high pressure in the form of a gas or a gas and hydraulic fluid. Accumulators shall be constructed under the provisions of Part 54 of this subchapter.

(b) If the accumulator is of the gas and fluid type, suitable separators shall be provided between the two media, if their mixture would be dangerous, or would result in contamination of the hydraulic fluid and loss of gas through absorption.

(c) Each accumulator which may be isolated, shall be protected on the gas

and fluid sides by relief valves, set to relieve at pressures not exceeding the maximum allowable pressures. When an accumulator forms an integral part of systems having relief valves, the accumulator need not have individual relief valves.

§ 55.17–35 Hydraulic cylinders.

(a) Hydraulic cylinders consisting of a container and a movable piston with a rod extending through the containment vessel are considered to be auxiliary machinery coming within the scope of Part 57 of this subchapter.

(b) Hydraulic cylinders shall be designed for a bursting pressure of not less than 4 times the maximum allowable pressure and shall meet the applicable standards established by the American Bureau of Shipping or other recognized classification society.

§ 55.17–40 Tests.

(a) Hydraulic systems and components thereof shall be tested, marked and retested as required by Part 61 of this subchapter.

(b) Hydraulic systems shall be purged with an inert gas or with the working fluid and all trapped air bled from the system prior to any shipboard testing. In no case shall air, oxygen, any flammable gas, or any flammable mixture of gases be used for testing.

PART 56—ARC WELDING, GAS WELDING, AND BRAZING

Subpart 56.01—Arc Welding and Gas Welding

Sec.

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56.01–5 Definitions.
56.01–8 Plan approval.
56.01–10 Welder qualification.
56.01–15 Welding procedure qualification.
56.01–20 Arc welding electrodes.
56.01–25 Classes of arc-welded pressure vessels.
56.01–30 Welded joint efficiencies.
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56.01–50 Detail requirements.
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56.01–57 Unreinforced holes in welded joints.
56.01–65 Seal welding and tack welding.
56.01–70 Preheating and stress relieving.
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Subpart 56.05—Tests and Inspection

56.05–1 Test plates.
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56.10–1 Definition.
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56.10–10 Materials.
56.10–15 Thickness and maximum allowable pressure.
56.10–20 Types of joints.
56.10–25 Pipe joints.
56.10–30 Silver brazing.

AUTHORITY: The provisions of this Part 56 issued under R.S. 4405, as amended, 4462, as amended; 46 U.S.C. 375, 416. Interpret or apply R.S. 4399, as amended, 4400, as amended, 4417, as amended, 4417a, as amended, 4418, as amended, 4421, as amended, 4426–4431, as amended, 4433, as amended, 4434, as amended, 4453, as amended, 4488, as amended, 4491, as amended, sec. 14, 29 Stat. 690, as amended, sec. 10, 35 Stat. 428, as amended, 41 Stat. 305, as amended, secs. 1, 2, 49 Stat. 1544, 1545, as amended, sec. 17, 54 Stat. 166, as amended, sec. 3, 54 Stat. 347, as amended, sec. 3, 70 Stat. 152, sec. 3, 68 Stat. 675; 46 U.S.C. 361, 362, 391, 391a, 392, 399, 404–409, 411, 412, 435, 481, 489, 366, 395, 363, 367, 526p, 1333, 390b, 50 U.S.C. 198; E.O. 11239, July 31, 1965, 30 F.R. 9671, 3 CFR, 1965 Supp. Treasury Department Orders 120, July 31, 1950, 15 F.R. 6521; 167–14, Nov. 26, 1954, 19 F.R. 8026; 167–20, June 18, 1956, 21 F.R. 4894; CGFR 56–28, July 24, 1956, 21 F.R. 5659; 167–38, Oct. 26, 1959, 24 F.R. 8857.

Subpart 56.01—Arc Welding and Gas Welding

§ 56.01–1 Scope.

This part contains detail requirements covering the welded fabrication of machinery appurtenances and pressure-containing parts such as boilers, boiler furnaces, unfired pressure vessels, piping, valves, pipe fittings, etc., subject to inspection by the Coast Guard.

§ 56.01–5 Definitions.

(a) *Welding terms.* All references in this part or on plans, specifications, etc., to welding or allied processes shall be understood to be those of the American Welding Society's A3.0–49 "Welding Terms and Their Definitions." [1]

(b) *Fabrication.* The term "fabrication" as used in this part refers to the assembly of machinery and appurtenances by welding, cutting and other processes allied to welding.

(c) *Welding procedure.* The term "welding procedure" refers to the detailed methods and practices including joint welding procedures involved in the production of a weldment.

(d) *Welding process.* Welding process is a metal-joining process wherein coalescence is produced by heating to suitable temperatures with or without the application of pressure, and with or without the use of filler metal.

§ 56.01–8 Plan approval.

Plans shall clearly show all essential fabrication details. Welded or brazed joints shall be clearly and completely detailed on the plans, or standard welding symbols as specified in the American Welding Society's Standard A2.0–47, "Standard Welding Symbols" [1] shall be used to designate the type and size of welds.

§ 56.01–10 Welder qualification.

(a) *Qualification provisions.* (1) Each welder, prior to performing any production welding in fabricating equipment listed in § 56.01–1, shall demonstrate his ability to produce sound welded joints with the welding process to be used in production. This shall consist of welding the applicable test joints shown in table 56.01–10(j) to the soundness requirements specified in this section for each type of test, except welders may be considered qualified under the alternate provisions of subparagraph (2) of this paragraph. Welder qualification tests are not required for operators of machine-welding equipment.

(2) (i) Welders who have been qualified by the Bureau of Ships of the Navy Department, or the American Bureau of Shipping, shall be considered qualified within the limits covered by the qualification tests passed.

(ii) The omission of qualification tests of metal arc welders working on assemblies may be authorized by the Officer in Charge, Marine Inspection provided the initial production welds are radiographically examined and found satisfactory to the standards prescribed in Radiographic Standards for Welder Qualification Test, CG 115–1, a copy of which is on file with each Officer in Charge, Marine Inspection. The welder shall be considered qualified for the process, equipment and materials, and in the position of the production welding.

(iii) Qualification tests of welders may be omitted for welders who weld satisfactory procedure qualification test assemblies as required by the Commandant. The welder shall be considered qualified for the process, equipment and materials, and in the position for which the procedure is qualified.

(b) *Process.* The welding processes requiring qualification of welders shall be as follows:

(1) Manual, shielded metal arc.
(2) Semi-automatic, inert-gas (consumable electrode) metal arc.
(3) Semi-automatic submerged arc.
(4) Manual, inert-gas (tungsten electrode) metal arc.
(5) Manual carbon arc.
(6) Manual gas welding.
(7) Manual torch brazing.

(c) *Process qualification limitation.* Welders qualified for a given process with a specific type of electrode or welding rod shall be considered qualified for welding by that process with any other electrode or rod of similar type as provided for in table 56.01–10 (p).

(d) *Fabricator's responsibility.* The fabricator shall direct and supervise the testing of welders and shall bear the expense of conducting the tests. When welders are to be qualified by the Coast Guard, the fabricator shall notify the marine inspector and arrange a suitable time and place for conducting the tests so the marine inspector may be present.

(e) *Requalification requirements.* A welder shall be requalified whenever one or more of the changes listed below are made and is to be used in production:

(1) When the filler metal is changed to a filler metal having a different M number in table 56.01–10 (p) or to a filler metal not included, except that qualification under M2 shall qualify a welder for M1.

(2) When the welding position is changed to positions other than those previously qualified.

(3) When the backing strip in arc-welding single welded butt joints is omitted.

(4) When a backing strip in gas welding is added.

(5) Where there is a change in welding processes.

[1] These standards included in American Welding Society Handbook.

(f) *Qualification duration.* The welder's qualification from tests passed as prescribed in this section shall remain in effect indefinitely unless:

(1) The welder does not use the process for which he was qualified for a period of three months or more; or

(2) The marine inspector believes there is reasonable doubt of the welder's ability. In such cases the welder shall not perform production welding until he passes the applicable qualification tests.

(g) *Retests.* If any of the welder's qualification test welds fail to meet the requirements specified in this section, he may be allowed a retest under the following conditions:

(1) A retest may be made which shall consist of two test welds of each type he failed, all of which shall meet the applicable requirements.

(h) *Test records.* Qualification test records of each welder together with identification data, shall be maintained in typewritten form or in ink by the fabricator on cards similar to that shown in Figure 56.01–10 (h). Upon request, duplicate record cards shall be furnished the marine inspector or to any of the participating agencies.

(i) *Transferral of qualification.* The qualification of a welder shall not be transferred from one company's organization to another company's organization. The welder's qualification record may be transferred from one plant to another plant of the same company if authorized by the Officer(s) in Charge, Marine Inspection, involved.

(j) *Qualification test.* The welder qualification tests shall consist of welding the applicable test assemblies shown in Table 56.01–10 (j).

WELDER'S IDENTIFICATION

Date of birth (Month) (Day) (Year)	Place of birth (City) (State) (Country)	Check No.

Welder's Employment Record

Process	From—	To—

Welder's symbol

Photograph or thumb print

Date taken.....

Check:
Right Hand ☐
Left Hand ☐

(Welder's signature)

Name (Last) (First) (Middle) | Employed by— | Location of plant

Process	Test No.	Base metal	Position	Filler metal		Date of test	Group limitations	Type of test*	Signature of inspector	Agency
				Type	Size					

*P=Physical tests. R=Radiographic test.

FIGURE 56.01–10 (h)—Welder's identification and record of qualification tests.

TABLE 56.01–10 (j)—WELDER QUALIFICATION TESTS AND APPLICABLE CONDITIONS

Construction and material size	Position in which welding shall be done [1]		
	Flat, vertical, horizontal and overhead: grooves and fillets.	Flat and vertical: grooves and fillets, horizontal fillets.	Flat: grooves and fillets, horizontal fillets
On material of limited thickness (¾ inch or less).[2][3][4]	Test No. 1 in vertical and overhead positions. Figure 56.01–10 (j3).	Test No. 1 in vertical position. Figure 56.01–10 (j3).	Test No. 1 in flat position Figure 56.01–10 (j3).
On material of unlimited thickness.[2]	Test No. 2 in vertical and overhead positions. Figure 56.01–10 (j4).	Test No. 2 in vertical position. Figure 56.01–10 (j4).	Test No. 2 in flat position. Figure 56.01–10 (j4).
On pipe joints ¾ inch or less thick.[2][4][5]	Test No. 3 in horizontal and vertical fixed positions. Figure 56.01–10 (j5).		Test No. 3 in horizontal rolled position. Figure 56.01–10 (j5).
On pipe joints over ¾ inch thick.[2][6]	Test No. 4 in horizontal and vertical fixed positions. Figure 56.01–10 (j5).		Test No. 4 in horizontal rolled position. Figure 56.01–10 (j5).
For welders doing only tack- or fillet welding.	Test No. 5 in vertical and overhead fillet positions. Figure 56.01–10 (j7).	Test No. 5 in vertical and horizontal fillet positions. Figure 56.01–10 (j7).	Test No. 5 in horizontal fillet position. Figure 56.01–10 (j7).
For torch brazed piping [4].....	Test No. 6 in horizontal and vertical fixed positions. Figure 56.01–10 (j8).		
For torch brazing other than piping.	Test No. 7 in vertical and overhead fixed positions. Figure 56.01–10 (j9).		

[1] In special cases when welding is to be done in positions other than those shown in figure 56.01–10 (j2) the welder qualification test plate may be made in the position in which welding will be done with the limitation that the qualification shall be valid only for the actual position tested. An angular tolerance of plus or minus 15° shall apply.

[2] Where the maximum thickness of material on which a welder may work throughout the period governed by a test is indeterminate, the marine inspector may, if desired, require the welder to qualify under unlimited thickness requirements.

[3] Where the maximum thickness of material to be welded throughout the period governed by the test is less than ¾ inch, the fabricator may, with the permission of the marine inspector, use the following modification of test number 1: The thickness of material shall be the maximum to be welded in production but shall not be less than $\frac{3}{16}$ inch. The root opening shall not be more than one nominal diameter of the filler metal to be used. The backing strip thickness shall be not less than $\frac{5}{32}$ inch.

[4] Welders qualified under the requirements of test number 1 in the flat position shall be considered qualified to weld piping ¾ inch or less in thickness in the horizontal rolled position and longitudinal pipe joints ¾ inch or less in thickness in the flat position. Welders qualified by test number 1 in the vertical position shall be considered qualified to weld piping ¾ inch or less in thickness in the horizontal fixed position from the horizontal axis up.

[5] Welders qualified under the requirements of test number 2 in the flat position shall be considered qualified to weld piping over ¾ inch in thickness in the horizontal rolled position and longitudinal pipe joints over ¾ inch in thickness in the flat position. Welders qualified by test number 2 in the vertical position shall be considered qualified to weld piping over ¾ inch in thickness in the horizontal fixed position from the horizontal axis up.

[6] Welders qualified under the requirements of test number 3 shall be considered qualified to make welds governed by test number 1 for the positions tested under test number 3.

[7] Welders qualified under the requirements of test number 4 shall be considered qualified to make welds governed by tests numbers 1, 2, and 3 for the positions tested under test number 4.

[8] Where the welder is to be qualified for welding or torch brazing of piping onboard ship the space restrictions shown in connection with tests numbers 3, 4, and 6 shall be used.

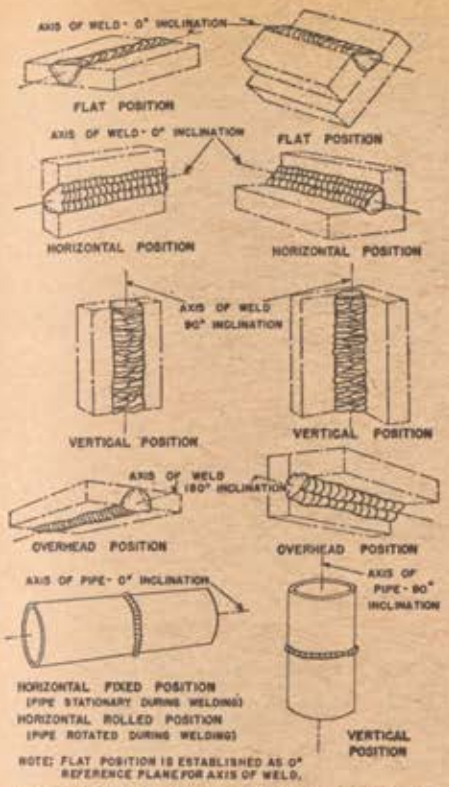
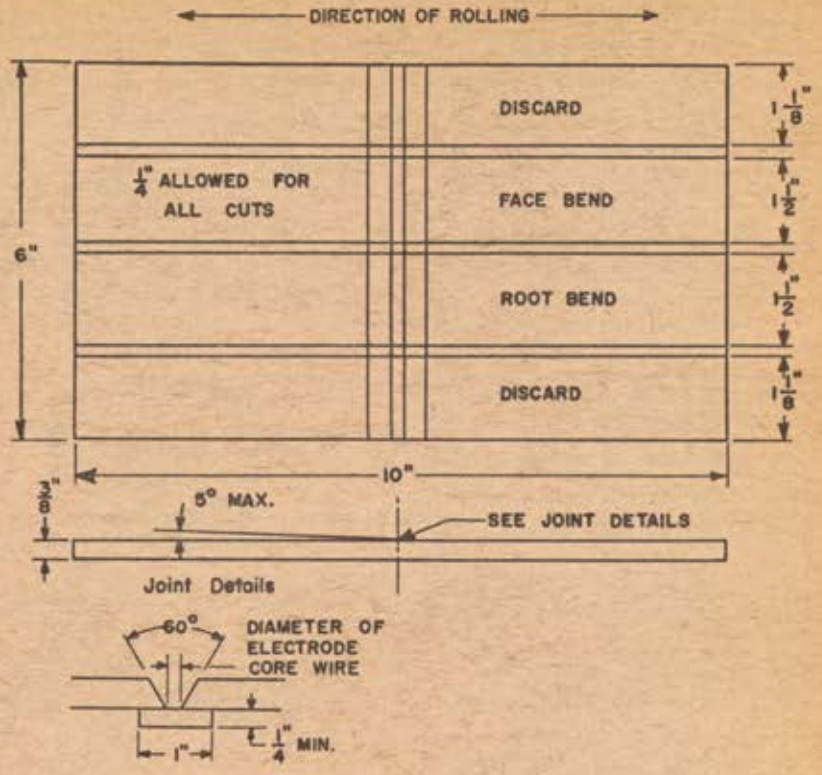


FIGURE 56.01-10 (j2)—Positions of welding.

(k) *Test assembly markings.* Qualification test assemblies and all specimens removed therefrom shall be stamped or otherwise indelibly marked with the welder's identification number or symbol, the official stamp of the U. S. Coast Guard, and the marine inspector's initials or other identifying markings to establish the welding position and type of specimen. The test assembly markings shall be so located that they will not be removed by machining.

(l) *Requirements for test numbers 1, 2, 3, and 4.* (1) Specimens cut from the test plates shall be bent in a bending jig having the exact profile illustrated by figure 56.01-10 (j6). Specimens for qualification test number 1 modified for thinner material shall be bent in a jig having a contour proportional to the thickness of the test plates involved as shown in figure 56.01-10 (j6). Root bend specimens shall be bent with the root of the weld in tension; face bend specimens with the face in tension, and side bend specimens with that side, which is suspected of being the worst of the two, in tension.

(2) Specimens shall be bent until they conform to the contour of the female member of the jig, and until a 1/32-inch wire cannot be placed between the specimen and any point on the curvature of the male member of the jig. Any specimen in which a crack or opening exists before bending, or which results from the bending, exceeding 1/8 inch measured in any direction, shall be rejected. No elongation data are required.



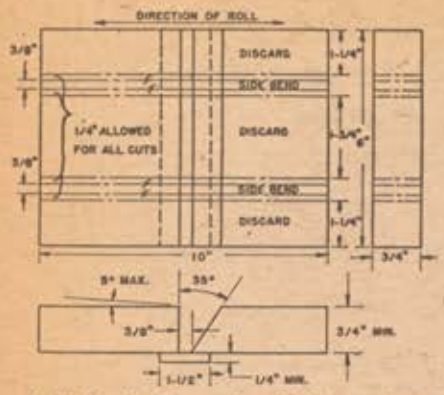
1. Weld shall be made with the maximum size electrode or welding rod suitable for the position and thickness of test plate.
2. Backing strap shall be contiguous with plates.
3. Joints welded in vertical position shall be welded upwards.
4. Welding shall be done from one side only.
5. Reinforcement and/or backing strap shall be machined flush. Undercutting shall not be removed.
6. Specimens may be machined or oxygen cut from plate.
7. Edges of specimens may be broken to a maximum radius of T/6.

FIGURE 56.01-10(j3)—Qualification test No. 1.

(3) In lieu of tests as prescribed above, welders may be qualified by radiographic examination of butt joints for qualification tests numbers 1, 2, 3, and 4. Satisfactory passing of tests shall be determined from radiographs which show penetrameter and which show deposited weld metal free from slag entrapment, weld or fusion zone cracking, and does not contain porosity in excess of that shown in the applicable group of Radiographic Standards for Welder Qualification Test, CG-115-1, a copy of which is on file with each Officer in Charge, Marine Inspection. The radiographs of the test plates shall indicate that the weld(s) are acceptable for group 1 or 2 covering the fabrication classification for which the welder is being qualified as specified in table 56.01-10 (l) (3).

TABLE 56.01-10 (l) (3)—WELDER RADIOGRAPHIC QUALIFICATION TESTS

Group	Classification
1	Class I piping.
1	Class I and class II welded pressure vessels.
2	Class II piping.
2	Class III welded pressure vessels.



1. Welds shall be made with the maximum size electrode or welding rod suitable for the position and thickness of test plate.
2. Backing strap shall be contiguous with plates.
3. Joints welded in the vertical position shall be welded upwards.
4. Welding shall be done from one side only.
5. Machine reinforcement and backing strap flush. Do not remove any undercutting.
6. Specimens may be machined or oxygen cut from plate.
7. Break edges of specimens to a radius of T/6 maximum.

FIGURE 56.01-10(j4)—Qualification test No. 2.

(m) *Test number 5.* Fillet weld specimens shall comply with the following requirements:

(1) Welds shall be of the specified size and shall be within the applicable convexity or concavity limits of the gage.

(2) Base metal shall be free from excessive undercutting.

(3) Surface of welds shall be free of cracks, porosity, overlap and roughness.

(4) Fractured surfaces of fillet welds shall be free from cracks, and the sum of lengths of slag inclusions, gas pockets, worm holes, and sections of incomplete fusion that are present shall not exceed 1½ inches per 12 inches of weld.

(n) *Test number 6.* The torch brazed assembly shall comply with the following requirements:

(1) Exterior examination of the joint shall show a complete ring of filler metal between the tube and the outer ends of the fittings. Surfaces of the specimens shall be free of globules of filler metal. Fillets shall be concave and of minimum practicable dimension.

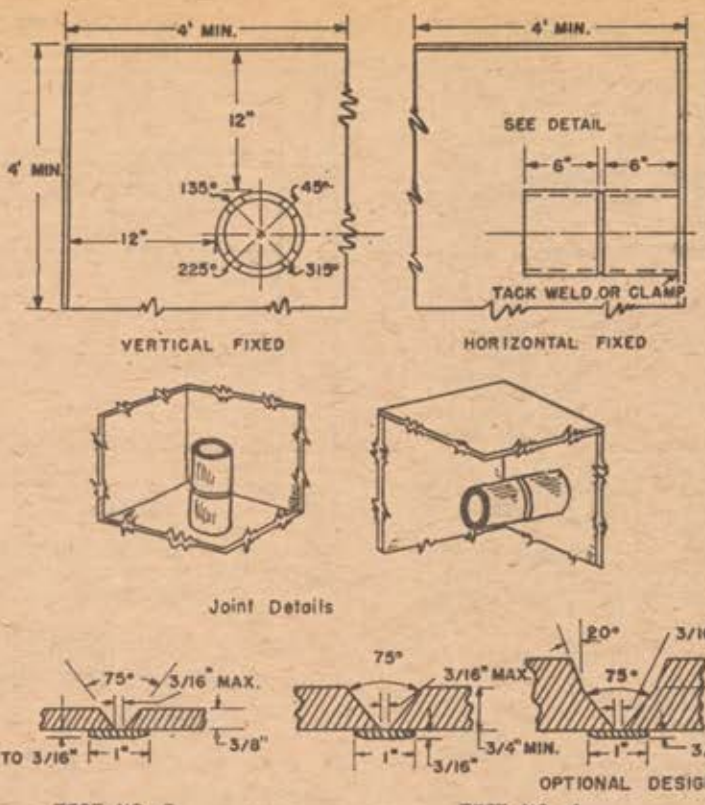
(2) The specimens shall be cut as shown in figure 56.01-10 (j8). Visual examination of the joints shall show complete penetration of the filler metal throughout at least 75 percent of the circumference of the fittings. Penetration is defined as follows: The presence or at least a metallic stain of filler metal at the fitting end of the tubing. The stain resulting from the penetration of the flux shall not be considered as penetration. The metallic stain is differentiated from the flux by its color which is grayish white. The flux stain is glossy in appearance.

(o) *Test number 7.* Specimens shall comply with the following requirements:

(1) Exterior examination of the joint shall show a complete line of filler metal at each edge of the joint. Surfaces of the specimen shall be free of globules of filler metal. Fillets shall be concave and of minimum practicable dimension.

(2) After visual examination specimens shall be fractured by peel test as shown in figure 56.01-10 (j10). Visual examination of the faying surface of the joint shall show at least 75 percent penetration of the filler metal throughout the joint. Specimens which do not fracture by peel test shall be acceptable if failure occurs in the base metal away from the joint.

(p) *Filler metal.* The grouping of electrodes and welding rods together with applicable specifications shall be as indicated in table 56.01-10 (p). The number grouping of electrodes and welding rods shown is based essentially on their usability characteristics which fundamentally determine the ability of a welder to make acceptable welds with a given electrode.



TEST 3A - WHERE MAXIMUM THICKNESS TO BE WELDED IS LESS THAN 3/8" WALL THICKNESS OF PIPE SHALL BE MAXIMUM TO BE WELDED BUT NOT LESS THAN 3/16"

SPECIMENS -
TEST 3 - FACE BENDS FROM 45° AND 225° POSITIONS
ROOT BENDS FROM 135° AND 315° POSITIONS
TEST 3A - MACRO SPECIMENS FROM 45°, 135°, 225°, AND 315° POSITIONS
TEST 4 - SIDE BENDS FROM 45°, 135°, 225°, AND 315° POSITIONS

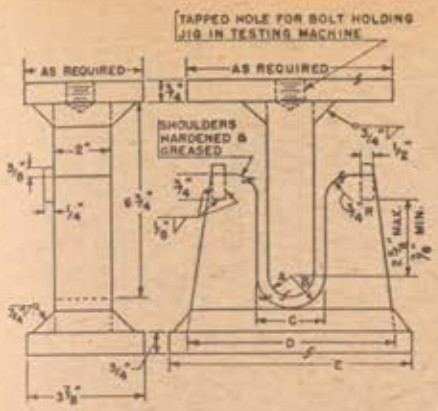
1. Space restrictions shown may be omitted when welders are to weld piping only in the shop.
2. Nominal pipe size shall be 5 inches or larger.
3. Weld shall be made with the maximum size electrode or welding rod suitable for the position and thickness of test plate.
4. Welding shall be from one side only.
5. Mark top and front of pipe to insure location of specimens.
6. Machine reinforcement and backing ring flush-undercutting shall not be removed.
7. Specimens may be machined or oxygen cut from pipe.
8. Edges of specimens shall be broken to a radius of T/6 maximum.

FIGURE 56.01-10 (j5)—Qualification tests Nos. 3 and 4.

§ 56.01-15 Welding procedure qualification.

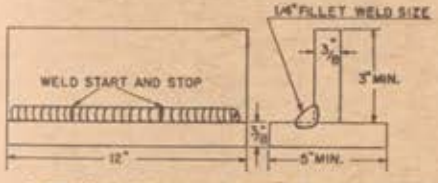
(a) Fabricators desiring to use the submerged arc welding process, or a combination of submerged arc and manual welding processes, or any welding process requiring procedure qualification tests as prescribed by the regulations in this subchapter, shall conduct a procedure qualification test to insure that they have proper equipment, trained personnel, and are using correct procedure to produce acceptable welds.

(b) The deposited weld metal may be laid in single or multiple passes. The joint design, amperage, voltage, speed of welding, size of welding wire, filler metal or electrode, and grade of melt or flux or type of inert gas, in general should be in accordance with the recommendations of the welding equipment manufacturer.



SPECIMEN MATERIAL	SPECIMEN THICKNESS	DIMENSIONS A	B	C	D	E
BASE METALS OTHER THAN ALUMINUM	3/8"	3/4"	1-3/16"	2-3/8"	7-1/2	9
	1"	2T	2T+1/16	6T+1/8	20T	24T
ALUMINUM	3/8"	1-1/8"	1-5/16"	3-3/8"	8-1/4"	9-3/4"
	1"	3T	4T+1/16	8T+1/8	22T	26T

FIGURE 56.01-10 (j6)—Jig for guided bend test.



1. Weld shall be made with the maximum size of electrode suitable for the position and thickness of test plate.
2. Weld size specified is for single pass weld only.
3. Joints welded in the vertical position of welding shall be welded upwards.
4. Base plate and standing web shall be straight and in intimate contact throughout its length and securely tacked at ends before fillet weld is made.
5. The test assembly may be machined or oxygen cut into sections approximately 6 inches long to facilitate testing.

FIGURE 56.01-10 (j7)—Qualification test No. 5.

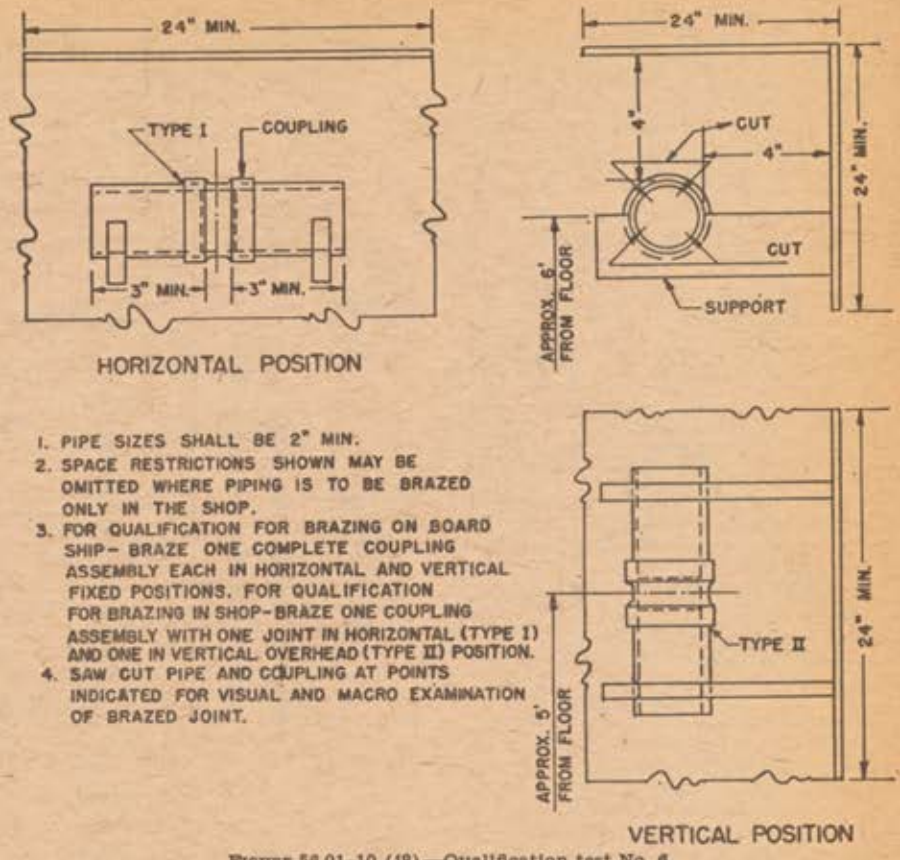


FIGURE 56.01-10 (j8)—Qualification test No. 6.

TABLE 56.01-10 (p)—GROUPING OF ELECTRODE AND WELDING RODS

Type of weld deposit		Applicable specification	Electrode Classification [1] [2] XX10 XX11	XX12 XX13	XX20 XX30	XX15 XX16	Welding rod classification
Mild steel	All types	A233-55	M1	M1	M1	M2	
Carbon molybdenum	All types	A316-54T	M1		M1	M2	
Low alloy steel	All types	A316-54T	M1			M2	
Chrome molybdenum	4 to 6 percent chrome-502	A298-55T				M2	
High alloy martensitic	11 to 14 chrome 410	A298-55T				M2	
Chrome nickel	308, 308 ELC 309, 309 cb, 309 Mo, 316,316 ELC, 318, 347.	A298-55T				M3	
Mild steel	All	A251-46T					M4

[1] Qualification of a welder for M2, automatically qualifies him for M1 but not vice versa. A welder qualifying with an electrode M3 and above is qualified only for that group.
[2] Covering and filler metal types not listed above shall require separate qualification.
[3] Base metal—Qualification of welding electrodes classes M1, M2, and M3 shall be performed on base metal of the comparable tensile strength and chemical analysis as the deposited weld where mechanical tests are used. Where qualification is by radiographic means, carbon steel may be used as the base material for qualification tests with M1 M2, and M3 electrode classes.

(c) Manufacturers desiring to secure process approval to fabricate pressure vessels, pipe and pressure-containing appurtenances by the use of any welding process requiring procedure qualification shall prepare test plates in the presence of a marine inspector who will stamp the plates with the official stamp of the Coast Guard. Specimens as required by Table 56.01-15(c) shall be machined from the test plate.

(d) The test plate material shall be of the type to be welded in production and of a thickness as shown in Table 56.01-15(c). The requirements specified in this section are applicable to materials having equivalent physical properties. If preheat is not used in production welding, it shall not be used in the preparation of the test plate. If it is desired to conduct a procedure qualification to weld metals of dissimilar physical properties, the fabricator shall so inform the Commandant who will designate the types and methods of tests.

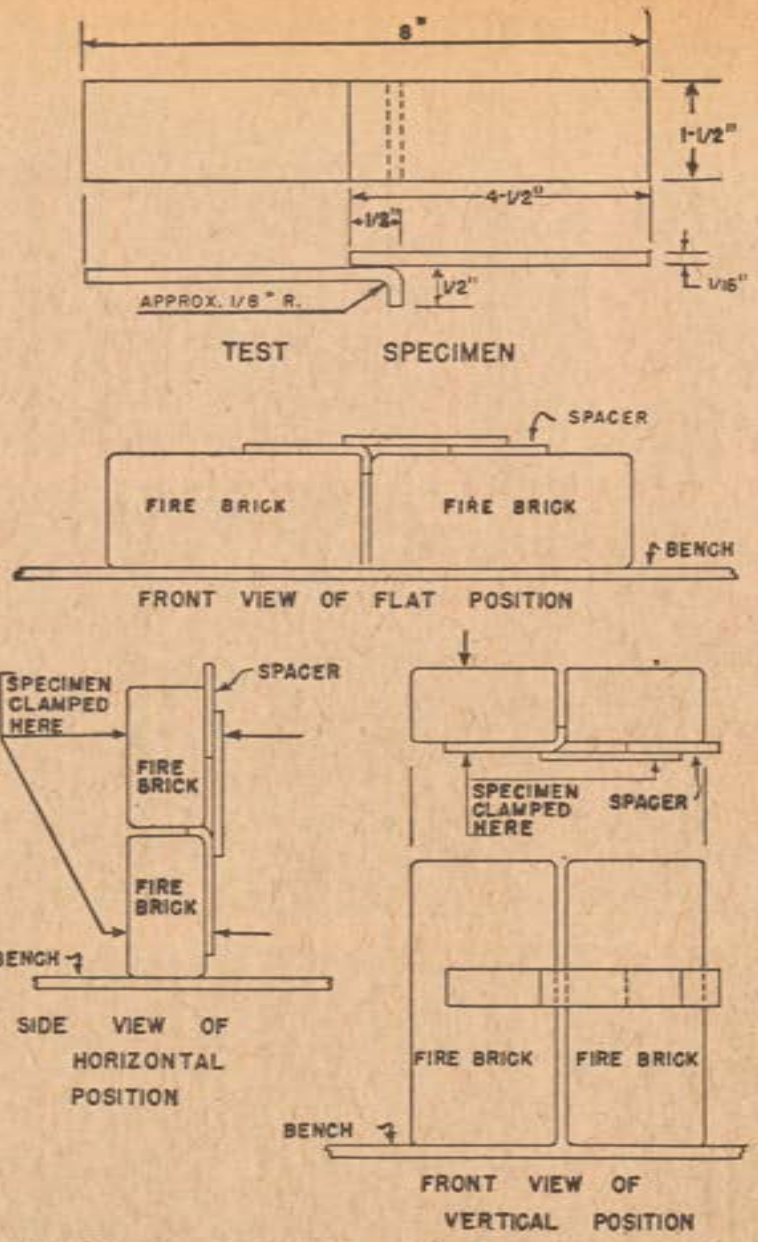
(e) Specimens may be tested by the fabricator or at a recognized testing laboratory. Specimens shall meet the requirements of § 56.05-1 and shall be tested in the presence of an inspector. One retest will be permitted for each specimen failing to meet the requirements. Should the retest fail, the fabricator shall take suitable remedial action to insure that the procedure is correct prior to the preparation of an additional set of test plates.

(f) The macro-etch specimen with the weld reinforcement in place shall be etched with a reagent which will clearly define the weld grain structure. After the specimen is etched it shall be given a protective coating to prevent oxidation.

(g) Results of the physical tests, the etch specimen and a sketch showing joint preparation, together with the information required in paragraph (b) of this section, shall be forwarded to the Commandant for consideration prior to the fabricator using the process in production welding.

(h) The fabricator shall prepare a specification covering the procedure qualification as used in preparing the test plate and shall furnish a copy to the marine inspector. The procedure used in qualifying shall be employed in fabrication except that speed of welding, amperage and voltage may vary to suit different material thicknesses. If the joint design, filler metal or type of inert gas is changed or alloy steel is to be fabricated and carbon steel used in the preparation of the test plate, a new procedure qualification shall be conducted.

(i) The fabricator shall weld a test plate of the actual thickness to be used in production to demonstrate to an inspector that he is using the proper welding procedure to obtain complete penetration.



1. Assembly shall be brazed in horizontal, vertical, or flat position as applicable, heating shall be done from one side only.
2. Assembly shall be tested as indicated in figure 56.1-10 (j10).

FIGURE 56.01-10 (j9)—Qualification test No. 7.

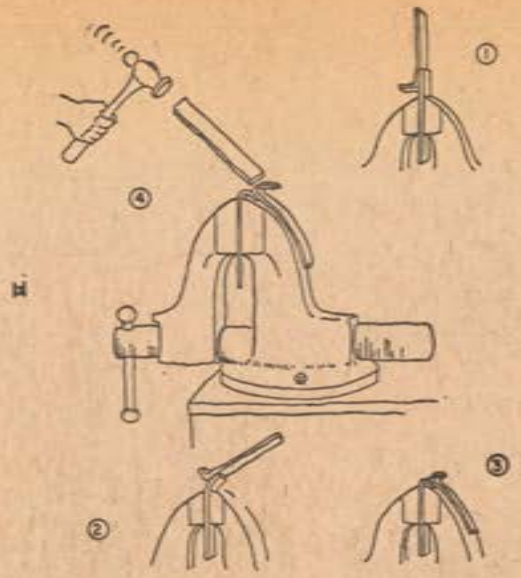


FIGURE 56.01-10 (j10)—Peel test for qualification test No. 7.

TABLE 56.01-15(g)—REQUIRED TESTS FOR PLATE GROOVE WELDS

Test plate or pipe thickness T	Maximum production plate thickness	Number and type of tests required				
		Reduced section tensile	Root bend	Face bend	Side bend	Macro etch
3/16 inch to and including 3/4 inch.	2T	2	2	2		1
Over 3/4 inch	2T for multiple pass welding	2			4	1
	2T but not over 2 inches for welding one pass from each side.	2			4	1
	T for welding from one side only against a copper or melt backup.	2			4	1

§ 56.01-20 Arc welding electrodes.

(a) Acceptable brand names of arc welding electrodes, as published in the Equipment Lists, CG-190, shall be used in the welded fabrication of machinery appurtenances and pressure-containing parts as given in § 56.01-1.

(b) Type E6012, E6013, E6014, E6024, E7014, or E7024 electrodes shall not be used in the fabrication of any item listed in paragraph (a) of this section.

§ 56.01-25 Classes of arc-welded pressure vessels.

For the purpose of the uniform application of the regulations in this subchapter, arc-welded pressure vessels shall be divided into three classes as given in Table 56.01-25.

TABLE 56.01-25—PRESSURE VESSEL CLASSIFICATION

Class of pressure vessel	Service	Limitations: Pressure, p. s. i.	Limitations: Temperature, ° F.	Maximum metal thickness, in inches
I	Power boilers: All pressure parts	Over 30	All	None
	Unfired pressure vessels containing:			
	(a) Vapors or gases	Over 600	Over 700	None
	(b) Liquids	Over [1] 600	Over 400	None
	(c) Dangerous substances	(2)	(2)	
II	Unfired pressure vessels containing:			
	(a) Vapors or gases	31 to 600, inclusive	276 to 700, inclusive	[3] 1¼
	(b) Liquids	201 to [1] 600, inclusive	251 to 400, inclusive	[3] 1¼
	(c) Dangerous substances	(2)	(2)	
III	Heating boilers:			
	(a) Steam	30 and under	275 and under	
	(b) Hot water	30 and under	250 and under	
	Unfired pressure vessels containing:			
	(a) Vapors or gases [4]	30 and under	275 and under [5]	[3] ⅝
	(b) Liquids [4]	200 and under	250 and under [5]	[3] ⅜

[1] This pressure limitation does not apply to vessels containing liquids under hydrostatic pressure at atmospheric temperatures.
[2] Stored or stowed dangerous substances may be carried in either Class I or Class II pressure vessels within the pressure and temperature limits prescribed in Subchapter N (Dangerous Cargoes) of this chapter.
[3] The limit of plate thickness does not apply to heads formed from a single plate.
[4] Class III pressure vessels shall not be used for the storage or stowage of lethal gases or liquids or such dangerous substances which are regulated by the requirements of Subchapter N (Dangerous Cargoes) of this chapter.
[5] Class III pressure vessels shall not be used for the storage or stowage of gases or liquids at temperatures exceeding their boiling point at atmospheric pressure.

§ 56.01–30 Welded joint efficiencies.

(a) The maximum joint efficiencies to be used in the design of pressure vessels or parts of pressure vessels fabricated by arc or gas welding shall be as given in Table 56.01-30 (a). The joint efficiencies shall depend on the type of joint welded and on whether or not the pressure vessel is stress-relieved or radiographed.

(b) (1) A maximum joint efficiency of 1.00 may be used for Class I unfired pressure vessels provided the weld reinforcements are removed so that the full longitudinal and circumferential welds on both sides of the joints are substantially flush with the surface of the plates, except that for unfired pressure vessels having thicknesses not more than ½ inch and operating at ambient temperature the weld reinforcement shall meet the requirements of § 56.05-5(c)(3). The joint efficiency of 1.00 shall be limited to double welded butt joints, or to joints made equivalent to double welded butt joints by other means which will obtain the same quality of deposit weld metal on the inside and outside of the weld surfaces to agree with the requirements of § 56.05-5(c). Single welded butt joints using metal backing strips which remain in place are excluded.

(2) A maximum joint efficiency of 0.95 may be used for Class I pressure vessels provided the weld reinforcement is removed so that the longitudinal weld(s) on both sides of the joint is substantially flush with the surface of the plates, and on all intersecting butt-welded circumferential joints the reinforcement is similarly removed five times the plate thickness (or 6 inches whichever is less) on each side adjacent to any longitudinal joint.

§ 56.01–40 Material.

(a) Ferrous and nonferrous material for use in fabrication of shells and heads of welded pressure vessels shall comply with the grades of material specified in Part 51 of this subchapter as suitable for arc or gas welding.

(b) Wrought, cast, or forged materials shall be of good weldable quality having a carbon content not exceeding 0.35 percent and other chemical elements affecting weldability shall not exceed a percentage which may cause fabrication difficulty.

TABLE 56.01-30(a)—MAXIMUM ALLOWABLE EFFICIENCIES FOR WELDED JOINTS [1]

Type of joint	Limitations	Basic joint efficiency (percent) [2]	Radiographed	Thermally stress-relieved	Maximum joint efficiency (percent)
Double-welded butt joint.	Unfired pressure vessels	90	R	R	[3] 100
	Class I welded pressure vessel		R	R	[3] 95
			R	R	90
Single-welded butt joint with backing strip. [4]	Longitudinal joint maximum thickness 1¼ inches. No thickness limitation on circumferential joints. If welds not radiographed and stress-relieved this type joint limited to Class II and III welded pressure vessel.	80	R	NR	85
			NR	R	85
			NR	NR	80
Single-welded butt joint without backing strip. [5] Doubled-welded full-fillet lap joints.	Circumferential joints only. Maximum thickness ⅝ inch. Limited to Class II and III welded pressure vessel.	70	NR	R	75
			NR	NR	70
	Longitudinal joints maximum thickness ⅝ inch. Circumferential joints maximum thickness ⅝ inch. Limited to Class III welded pressure vessel.	65	NR	R	70
			NR	NR	65

R—Indicates "Required."
NR—Indicates "Not Required."

[1] See § 56.01-25 for classes of welded pressure vessels and Subpart 56.10 for unfired brazed pressure vessel requirements.
[2] Spot examination required by § 56.05-6 unless specifically exempted.
[3] Weld reinforcement required to be removed (see § 56.01-30 (b)).
[4] Where not possible to employ doubled-welded butt joint the above type may be considered equivalent to a double-welded joint if the requirements of § 56.01-55 are met.
[5] In welding single-welded butt joints, complete penetration at the root is required, which must be demonstrated by the qualification of the procedure to be used. If complete penetration cannot otherwise be secured, the procedure shall include a backing ring or equivalent.

§ 56.01–45 Calculations.

(a) The minimum thickness and maximum allowable pressure for shells of welded pressure vessels shall be determined by § 52.05-10 of this subchapter.

(b) The minimum thickness and maximum allowable pressure for heads of welded pressure vessels shall be determined by §§ 52.20-10 and 52.22-10 of this subchapter.

(c) The minimum thickness and maximum allowable pressure for welded piping shall be determined by § 55.07-5 of this subchapter.

§ 56.01–50 Detail requirements.

(a) The surfaces of parts to be welded shall be cleaned of scale, rust, and grease at least ½ inch from the welding edge. Grease or oil may be removed by a nonhazardous solvent. A wire brush may be used to remove light corrosion or mill scale. Heavy mill scale, slag, etc., shall be removed by chisel, air hammer, or other suitable tool to secure clean metal. (Discoloration resulting from flame cutting is not considered detrimental oxidation.) When it is necessary to deposit metal over a previously welded surface any scale or slag existing thereon shall be removed by a suitable means to prevent the inclusion of heterogeneous matter in the weld metal.

(b) The members to be joined shall be accurately cut to size and form. In all cases the forming shall be done by pressure and not by blows, including the edges of the plates forming longitudinal joints of cylindrical shells.

(c) Precaution shall be taken in the preparation of joints in which fillet welds are used in order to secure fusion of the weld metal at root of the fillet. Care shall also be exercised in depositing the weld metal so as to secure satisfactory penetration.

(d) If the thickness of the flange of a head to be attached to a cylindrical shell by a butt joint exceeds the shell thickness by more than 25 percent (maximum ¼ inch), the flange thickness shall be reduced at the abutting edges as shown in figure 56.01-50 (d).

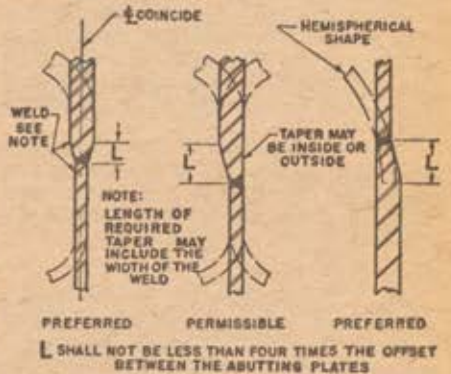


FIGURE 56.01-50 (d)—Types of joints for material of unequal thicknesses.

(e) The edges of the plates at the joints shall not have an offset from each other at any point in excess of one-quarter of the plate thickness at the joint, with a maximum permissible offset of ⅛ inch

for longitudinal joints and ¼ inch for circumferential joints.

(f) Where plates of unequal thicknesses are abutted, the edge of the thicker plate shall be reduced so that it is approximately the same thickness of the thinner plate. The middle lines of plate thicknesses for longitudinal shell joints shall be within the limits as given in paragraph (e) of this section.

(g) Except where specifically permitted in other sections, the design of welded pressure vessels shall be such that if the welded joint is subjected to a bending stress, the design shall be analysed so that the maximum stress will be within allowable limits. Complete penetration of the weld metal through the members joined shall be secured plus the addition of fillet welds where necessary to reduce stress concentration. Corner joints with members attached only by fillet welds where a concentrated bending stress will occur at the root of the weld are not permitted unless the members forming the corner are adequately supported independently of such welds.

(h) Bars, jacks, clamps, or other appropriate tools may be used to hold the edges to be welded in line. The edges of butt joints shall be held so that they will not overlap during welding. Where fillet welds are used, the lapped plates shall fit closely and be held together during welding.

(i) The joint preparation of the material to be welded shall be such as to permit good fusion and complete penetration where butt welds are employed.

(j) Double-welded butt joints shall have the reverse sides chipped, ground, or melted out, so as to secure a clean surface of the originally deposited weld metal, prior to depositing the first bead of welding on the reverse side. Chipping, grinding, or melting out shall be done in a manner that will insure proper fusion of the weld metal. The foregoing requirements do not apply to processes of welding whereby proper fusion and penetration are obtained and heterogeneous matter is eliminated from the root of the weld.

(k) If the welding is stopped for any reason, extra care shall be taken in restarting to secure complete penetration at the root of the weld and thorough fusion between the weld metal and the plates, and to the weld metal previously deposited.

(l) If single-welded butt joints are used, care shall be taken in aligning and separating the edges to be joined so that complete penetration and fusion at the root of the weld will be assured.

§ 56.01–55 Joints.

(a) (1) Longitudinal joints of Class I and Class II pressure vessels shall be of the double-welded butt type and a reinforcement of at least 1/16 inch shall be provided on each face of the weld, except for plates of ¼ inch or less in thickness the reinforcement need not exceed 25 percent of the plate thickness. The reinforcement on either or both faces of the weld may be removed, but if not removed shall be free of grooves, valleys, or other change in contour along the edge or upon the surface of the weld if the inspector deems such to be objectionable.

(2) When a single-welded butt joint is made the equivalent of a double welded joint by using a backing bar or its equivalent and depositing the filler metal from only one side to secure complete penetration, the requirements for reinforcement applies only to the face of the weld. The backing bar may be left in place or it may be removed. The root gap of 3/16 inch minimum shall be provided.

(3) Where the reverse side of a welded joint is not accessible, a single-welded butt joint employing an inert gas and/or consumable insert ring for the first pass back-up may be considered the equivalent to a double-welded butt joint, provided the welding procedure qualification tests are conducted in conformance with the requirements of § 56.01–15.

(b) The longitudinal joints of Class III welded pressure vessels shall be as given in § 56.01–30. The weld reinforcement shall be as required in paragraph (a) of this section. Fillet welds of lap type joints shall have a throat dimension of not less than $5/8T$, where T is the thickness of the shell plate. The surface of the overlap shall be not less than $4T$.

(c) Circumferential joints for Class I pressure vessels shall be of the double-welded butt type. Circumferential joints for Class II pressure vessels shall be of the double-welded butt type except for thicknesses of 5/8 inch or less, in which case they may be of the single-welded butt type. Circumferential joints on Class III pressure vessels may be of the butt or lap type. The details of all joints shall conform to the requirements for longitudinal joints, as given in paragraph (a) of this section.

(d) Dished heads concave to the pressure when used on Class III pressure vessels shall be inserted with a driving fit and fillet welded inside and outside, except that for vessels 20 inches in diameter or less the heads may be welded on the outside only. The welds shall be located on the flange of the head at a distance not less than twice the thickness of the head from the point of tangency of the knuckle and in no case less than ½ inch. Dished heads concave to the pressure shall have a length of flange not less than one inch for shells not over 24 inches in diameter. For shells over 24 inches in diameter, this length shall not be less than 1½ inches.

(e) Dished heads convex to the pressure shall have a flange not less than 1½ inches long except where the flange thickness is 3/8 inch or under, in which case the flange need not be more than four times the thickness of the head. When heads are inserted into the shell, same shall be with a driving fit and welded as shown in Figure 56.01–55(e).

(f) Heads concave to the pressure and plates having circumferential joints to be attached by butt welds shall be aligned so that the deviations are not more than permitted by the limitations given in § 56.01–50, but if greater, correction shall be made by reforming the shell or head, whichever is out of true, until the errors are within the limits specified. The edges of head and circumferential joints shall be separated by a suitable root gap to insure complete penetration of the weld metal.

(g) Intermediate heads of the type shown in Figure 56.01–55(e) may be used for all classes of pressure vessels provided the outside diameter of the head skirt is a close fit inside the overlapping ends of the shell courses. The butt weld and fillet weld shall be designed to take shear at 1½ times the maximum pressure on either side of the head, but in no case less than 50 p.s.i.

(h) Flat heads may be attached to pressure vessels in accordance with the requirements of § 52.22–10 of this subchapter.

(i) The welder's symbol shall be stamped on each pressure vessel adjacent to the weld and at intervals not to exceed three feet along the welds made manually or by machine. In lieu thereof, a permanent record may be kept by the manufacturer furnishing the name of the welder employed in making each joint. This record shall be made available to the inspector upon request.

§ 56.01–57 Unreinforced holes in welded joints.

(a) Unreinforced holes may be machine-cut through welded seams which have been stress-relieved and radiographed. The joint efficiency as well as the ligament efficiency shall be con-

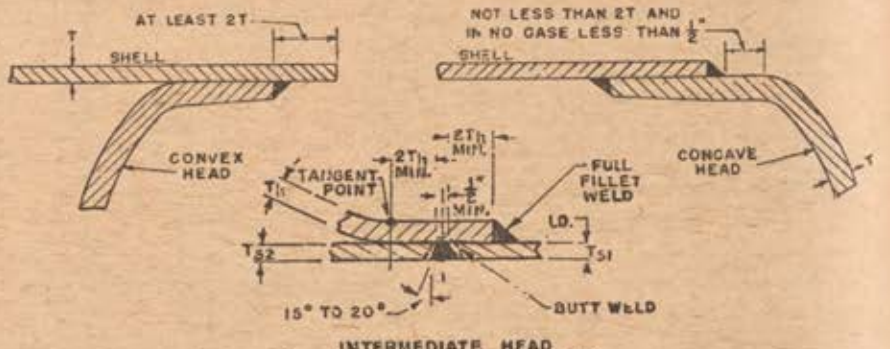


FIGURE 56.01–55(e)—Details of circumferential joints of dished heads.

sidered in calculating the required thickness.

(b) Tubes may be rolled and expanded in such unreinforced holes, or such holes may be threaded: *Provided*, That in the portion of the welded joint in which the holes are cut the following additional requirements are fulfilled:

(1) The welds shall be examined by the paramagnetic powder method on both sides and found to be satisfactory.

(2) The weld shall contain no slag inclusion or defect longer than 0.15T (where T is the thickness of the weld), but in no case greater than ⅜ inch.

(c) If either or both paragraphs (b) (1) and (b) (2) of this section are not complied with, the unreinforced holes for threaded connections or for rolled or expanded tubes may not be placed closer than ¼ inch to the edge of the fused metal, and no deduction need be made in the maximum allowable pressure computed for the same tube layout without a circumferential weld.

§ 56.01–65 Seal welding and tack welding.

(a) Seal welding may be used for the purpose of securing tightness of connections where the structure is such that no strain is placed upon the weld. Seal welding consists of depositing not more than two beads of weld metal. The throat of the weld shall not exceed ¼ inch and the size of the electrode employed shall not exceed 5/16 inch diameter. Seal welds are not required to be stress-relieved.

(b) Intermittent welding may be used for attaching internal baffles, strainers, external lugs, securing lagging, etc., provided the welds are of at least two passes, do not have a throat exceeding ¼ inch, are not more than 3 inches in length and have a center to center distance of at least twice their length.

(c) Intermittent welding and seal welding shall be done by qualified welders using acceptable electrodes (see § 56.01–20). Intermittent or seal welding shall not be done when the temperature of the metal of a pressure vessel is below 50° F. unless the base metal is preheated and held at a temperature of at least 200° F.

§ 56.01–70 Preheating and stress relieving.

(a) All Class I welded pressure vessels unless specifically exempted in other sections of this subchapter, shall be stress-relieved to dissipate the major portion of the residual stresses.

(b) Stress relieving shall be done by heating the weldment slowly and uniformly to a temperature of from 1,100° F. to 1,200° F. for carbon-steel and held at that temperature for a period of time proportioned on the basis of at least one hour per inch of thickness and allowed to remain in the furnace until 500° F. is reached at which time the weldment may be withdrawn and allowed to cool in a still atmosphere. When a weldment of various thicknesses of material is stress-relieved, the thickest section of the parts welded shall govern the length of time required for soaking. Pressure vessels fabricated of carbon-steel exceeding ½-inch in thickness shall be preheated locally to 125° F., prior to welding, when the ambient temperature is below 50° F. Alloy materials usually require different stress-relieving temperatures due to different chemical properties of the material. The heat treatment covering preheating and stress relieving to be employed on the latter types of materials shall be in accordance with the recommendations of the manufacturer of the material and as specifically approved by the Commandant.

(c) When the vessel is required to be stress-relieved, all connections attached by arc or gas welding unless specifically exempted shall also be stress-relieved as required by this part.

(d) Local stress relieving of welds shall be performed by means of electrical inductance, electrical resistance, or other acceptable means whereby the temperature is accurately controlled. When a type of stress relief is used that produces direct radiation, the thermocouple shall be insulated so that the hot junction of the thermocouple will not be subject to the heat of radiation. Pyrometric equipment shall be provided to indicate the hottest and coolest points of the weldment. If the weldment is of appreciable size, the number of thermocouples provided shall be sufficient to insure complete coverage. The temperature of the weldment shall be considered as being the average of the observed temperature.

(e) The stress relieving operations shall be indicated by pyrometric equipment. When an autographic record of local stress-relieving operations is made, this record shall be maintained by the fabricator.

(f) The weldment shall be stress-relieved by one of the methods as follows:

(1) Heating the complete structure as a unit.

(2) Heating a section containing the part or parts to be stress-relieved. In employing this method of stress relief direct flame impingement shall be avoided.

(3) Circumferential joints may be stress-relieved by uniformly heating a circumferential band having a minimum width of six times the material thickness on each side of the welded joint in such a manner that the entire band is brought up to the required temperature and held for the period specified in paragraph (b) of this section.

(4) Pipe shall be stress-relieved by heating a circumferential band having a width of at least 3 times the width of the widest part of the welding groove but not less than 6 times the maximum wall thickness at the weld with the weld at the center of the band. Where pipe is welded to a valve the heated zone may be decreased on the valve side of the joint to a minimum of one times the width of the weld reinforcement measured from the edge of the reinforcement toward the valve.

(5) Nozzles or other welded attachments which are required to be stress-relieved may be locally stress-relieved by heating a circumferential band around the entire vessel with the connection at the middle of the band to the required temperature and length of time specified for stress relieving. The band width shall be a minimum of six times the shell thickness on each side of the attachment.

(g) Except where specifically allowed in other sections in this subchapter, all nozzle connections after being attached by welding on Class I welded pressure vessels shall be stress-relieved.

(h) (1) Class II welded pressure vessels shall be stress-relieved under the following conditions:

(i) If required by Figure 56.01–70(h).

(ii) If fabricated of steel plate exceeding 0.58 inch thickness conforming to specifications A202, A203, A204, A225, A299, A387 Grade A, and for any steel having a specified molybdenum content of 0.50 percent nominal (permissible range 0.40 to 0.65 percent) with a chromium content not greater than 0.70 percent.

(iii) If fabricated of steel conforming to specifications A302, A387 Grades B and C, D and E, and for a chrome-molybdenum steel having a chromium content greater than 0.70 percent.

(iv) If fabricated as a Class II pressure vessel for use as a cargo tank for the storage or transportation of liquefied compressed gases and if designed for pressures exceeding 100 pounds per square inch.

(2) When class II welded pressure vessels are required to be stress-relieved, all nozzles or other welded attachments when joined by arc- or gas-welding shall be stress-relieved. When class II welded pressure vessels are not required to be stress-relieved, unreinforced nozzle connections and other attachments when joined by arc- or gas-welding are not required to be stress-relieved.

(3) When nozzles are reinforced with pads having a thickness greater than that of the shell or head to which they are attached, the nozzles shall be stress-relieved.

(i) Arc- or gas-welded connections may be added to class I and class II welded pressure vessels after they have been stress-relieved, without requiring stress-relief, provided:

(1) The diameter of the attachment opening in the vessel walls does not exceed that allowed for an unreinforced opening or does not exceed 2 inches, whichever is smaller; and,

(2) The inside and outside attachment welds do not exceed ⅜ inch throat dimension.

(3) This paragraph does not apply to those connections so placed as to form ligaments in the shell, the efficiency of which will affect the shell thickness. Such added connections shall be stress-relieved.

(j) All connections attached by arc or gas welding to vessels fabricated by other means shall be stress-relieved in accordance with the requirements for connections on class II pressure vessels. If any such vessels are to be used for service equivalent to class I pressure vessels, arc- or gas-welded connections shall be stress-relieved.

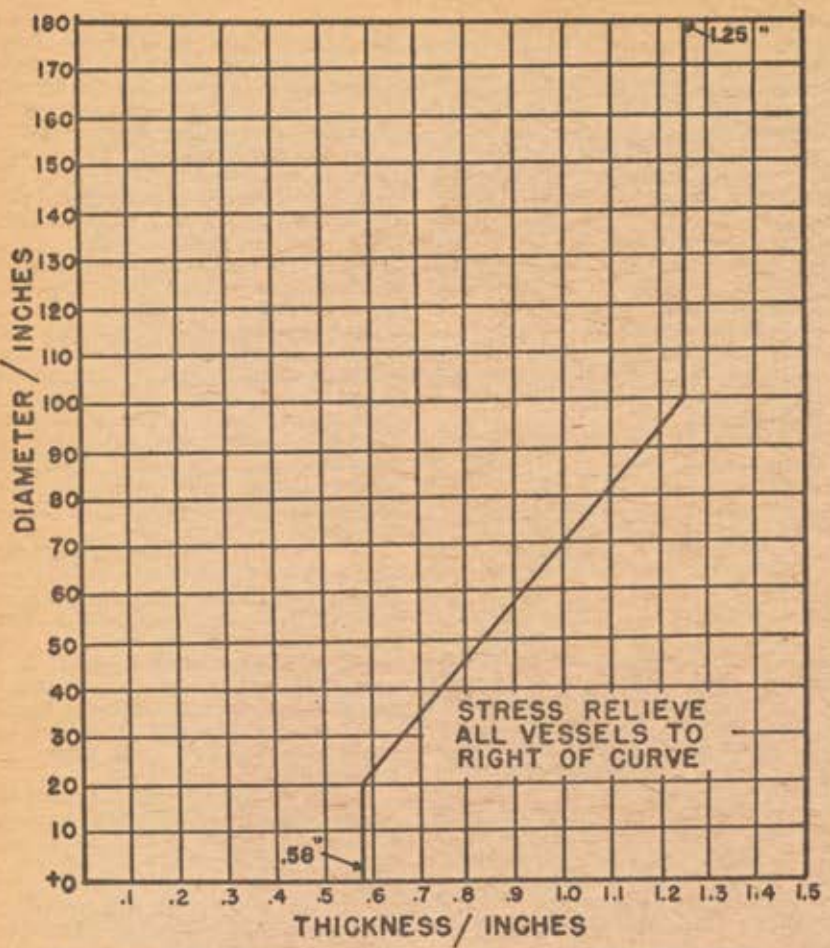


FIGURE 56.01-70 (h)—Stress relief diagram for class II pressure vessels.

(k) Arc- or gas-welded connections which require stress relieving and which are attached to vessels whose seams are of riveted construction shall be fabricated and stress-relieved prior to the making up or attachment of the courses by riveting. If they do not require stress relieving and are attached after riveting, the welds shall be located at a distance from the riveted seam at least equal to the diameter of the opening plus four times the plate thickness of the shell.

(l) All vessels containing lethal liquids or gases shall be stress-relieved. Any vessels containing liquids, gases or other substances which Part 38 of Subchapter D (Tank Vessels) or Part 146 or 147 of Subchapter N (Dangerous Cargoes) of this subchapter require to be fabricated in accordance with a class of pressure vessel requiring stress relief shall be stress-relieved.

(m) Cold weldments shall not be placed in the furnace when the temperature therein exceeds 500° F. Upon cooling, the weldment may be removed from the furnace when the temperature of same has reached 500° F. and allowed to cool in still air to assure a gradual decrease in temperature.

§ 56.01-75 Distortion.

Drums of welded or brazed pressure vessels shall be circular at any section within a limit of one percent of the mean diameter, based on the difference between the maximum and minimum mean diameter at any section If necessary to meet the foregoing requirement, the drum shall be reheated, rerolled, or reformed. To determine the difference in diameters, measurements may be made on the inside or the outside, and when the drum is fabricated of plates of unequal thickness, the measurements shall be corrected for plate thicknesses to determine the diameter at the middle line of the plate thickness.

§ 56.01-80 Welded piping.

(a) Piping materials complying with Part 51 of this subchapter may be joined by means of arc or gas welding provided the fabrication complies with the requirements of this section.

(b) The requirements of this section are applicable to class I piping (see Part 55 of this subchapter) and class II piping unless specifically exempted.

(c) Sections of pipe shall be welded insofar as possible in the fabricating shop. Prior to welding class I piping, the fabricator shall request an inspector to visit his plant to examine his fabricating equipment and to witness the qualification tests required by § 56.01-10. One test specimen shall be prepared for each process and welding position to be employed in the fabrication.

(d) (1) For Class I piping, double-welded butt joints or single-welded butt joints using a backing ring or its equivalent on the inside of the pipe, shall be employed for pipe diameters exceeding ¾ inches, except as permitted in this paragraph. Single-welded butt joints employing an inert gas and/or consumable insert ring for first pass back-up may be considered the equivalent to a double-welded butt joint, provided the welding procedure qualification tests are conducted in conformance with the requirements of § 56.01-15. Piping of diameters not exceeding 2 inches may be joined by sleeves fitted over the pipe ends, or by socket joints provided the size of each fillet weld is at least 1¼ times the tube or pipe wall thickness and the weld deposited with a minimum of two layers. Slip-on flanges complying with the 150-pound and 300-pound standards may be used in Class I piping for temperatures not exceeding that permitted in § 55.07-15(b) of this subchapter.

(2) Some acceptable types of weld pipe connections are shown in figure 56.01-80 (d).

(3) For carbon-steel material the backing ring for class I piping shall be of low-carbon steel and shall be of the plain type or a type with projections spaced intermittently around the outside of the periphery to establish a minimum root gap as shown in figure 56.01-80 (d), detail F. For alloy steel material the backing ring shall have heat resisting properties equivalent to that of the material being welded except carbon steel backing rings may be used when welding carbon-molybdenum material.

(e) For class II piping, the type of joints shall be similar to class I piping, with the following exceptions:

(1) Single-welded butt joints may be employed without the use of backing rings in all sizes provided that the weld is chipped or ground flush on the root side of the weld.

(2) For services such as vents, overflows, and gravity drains, the backing ring may be eliminated and the root of the weld need not be ground.

(3) Square-groove welds without edge preparation may be employed for butt joints in vents, overflows, and gravity drains where the pipe wall thickness does not exceed 5/16 inch.

(4) The crimped or forged backing ring with continuous projection around the outside of the ring is acceptable only for class II piping.

(f) All butt welds shall be reinforced at the center of the weld by not less than 10 percent of the wall thickness for pipe or tubes for thicknesses not exceeding ⅝ inch; pipes and tubes having a wall thickness exceeding ⅝ inch shall be reinforced by at least 1/16 inch. The reinforcement shall be free of grooves, valleys, or other changes in contour along the edge or upon the surface of the weld if the inspector deems such to be objectionable.

(g) Each butt-welded joint of class I piping shall be marked with the welder's identification symbol. Dies shall not be used to mark the pipe where the pressure exceeds 600 p. s. i. or the temperature exceeds 750 degrees F.

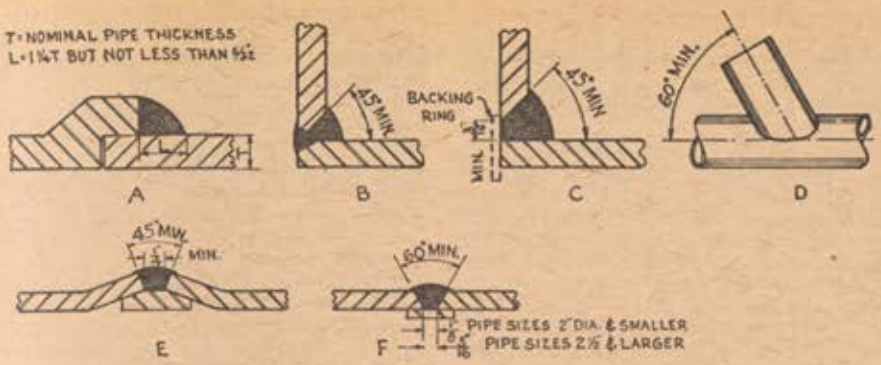


FIGURE 56.01-80 (d)—Acceptable types of welded pipe connections.

CONTRACTOR'S NAME _____

ADDRESS _____

PROCESS _____ DATE _____

MATERIAL (BASE METAL _____
(FILLER METAL _____

For Gas Welding
Type of Flame

_____

For Arc Welding
Type of Current

_____

If D. C., state polarity.

_____

IDENTIFICATION SYMBOLS OF THIS WELD

	PASS NUMBER	HEAT	INPUT	DATA	DIAM. OF FILLER METAL	TEMP. DEG. F*	REMARKS
In above space indicate edge preparation and relative position of each pass as deposited.							

*Give degree of preheat, if any. Indicate temperature of weld metal just prior to the deposition of each succeeding pass.

Cleaning of Passes _____

Treatment of Defects _____

Peening _____

Heat Treatment (Temp. _____
(Time _____
(Cooling _____

Name of welder _____
Name of Recorder _____

FIGURE 56.01-80 (m)—Manufacturer's record of welding process.

(h) All butt-welded joints in Class I piping exceeding 2½ inches in diameter, with the exception of high-pressure salt water piping systems used in tank cleaning operations and gas supply piping of carbon or carbon molybdenum steel used in gas turbines shall be stress-relieved as required by § 56.01-70.

(i) All complicated connections including manifolds, shall be stress-relieved in a furnace as a whole as required by § 56.01-70 before being taken aboard ship for installation.

(j) Class I carbon-steel and alloy-steel piping exceeding 2½ inches in diameter shall be preheated as required by § 56.01-70.

(k) (1) All butt-welded joints in Class I piping exceeding 2½ inches in diameter, with the exception of high-pressure salt water piping systems used in tank cleaning operations and gas supply piping of carbon or carbon molybdenum steel used in gas turbines shall be nondestructively tested as required by § 56.05-5.

(2) All welds shall be free of grooves and depressions. Surfaces of welded joints which are to be magnetic powder tested shall be made smooth of all surface irregularities so that the powder may properly indicate any fracture or defect.

(l) The base material and joint preparation for welding shall comply with the manufacturer's process record.

(m) A complete record of the manufacturer's process shall be maintained on the form shown by figure 56.01-80 (m) to establish definite limits of all essential variables involved. The manufacturer shall, after his welding process has been approved, conduct all welding in accordance with the requirements of his process record.

§ 56.01-85 Welded pipe fittings.

(a) Welded pipe fittings fabricated in conformance with the ASTM Standards shall be tested as required by the applicable specifications listed in Subpart 51.46 of this subchapter.

(b) Special fittings fabricated by welding which do not conform to ASTM Standards shall comply with the following requirements:

(1) *Sizes 2½ inches and below.* (i) The longitudinal joints of welded fittings may be fabricated by either gas or arc welding.

(ii) The first fitting of each size from the production line and at least one fitting from each lot of 100 or fraction thereof shall be flattened cold until the opposite walls meet without the weld(s) developing any cracks.

(iii) One fitting of each size from each lot of 100 or fraction thereof shall be subjected to a bursting pressure which shall be not less than that for a seamless drawn pipe of the same size and thickness produced from equivalent strength material, as determined by the Barlow formula. If this fitting fails to meet

the prescribed test, the entire lot of fittings shall be rejected.

(2) *Sizes above 2½ inches.* (i) The longitudinal joints of welded pipe fittings shall be fabricated by arc welding.

(ii) For pressures exceeding 150 p. s. i., each fitting shall be radiographically examined as specified in § 56.05–5.

(iii) For pressures not exceeding 150 p. s. i., the first fitting of each size from the production line and at least one fitting of each size in each lot of 20 or fraction thereof shall be examined by radiography to insure that the welds are of acceptable quality.

(iv) One fitting of each size in each lot of 100 or fraction thereof shall be subjected to a bursting pressure which shall be not less than that for a seamless drawn pipe of the same size and thickness produced from equivalent strength material as determined by the Barlow formula. If this fitting fails to meet the prescribed test, the entire lot of fittings shall be rejected.

(3) *Welded joint.* Single welded butt joints without the use of backing strip may be employed in the fabrication of welded pipe fittings provided the radiographs indicate that complete penetration is obtained.

Subpart 56.05—Tests and Inspection

§ 56.05–1 Test plates.

(a) Test plates shall be provided for class I and class II pressure vessels as hereinafter specified in this section.

(b) Except as otherwise specified in this section, a test plate of the same grade and thickness as the shell plate being welded shall be attached to the shell plate on one end of the longitudinal joint of each drum as shown in Figure 56.05–1 (b), so that the edges of the test plate to be welded are a continuation of and duplication of the corresponding edges of the longitudinal joint. For attached test plates, the weld metal shall be deposited in the test plate welding groove continuously with the weld metal deposited in the groove of the longitudinal joint. The test plate material may be taken from any part of one or more plates of the same heat from which the plates were rolled that was used in the fabrication of the welded pressure vessel. As an alternate method, the inspector may permit the use of separate test plates, provided the same welding process, procedure, and technique employed in the fabrication of the longitudinal joint are used in welding the test plates.

(c) When a test plate is welded for the longitudinal joints, none is required for the circumferential joints or nozzles of the same drum, providing the welding process, procedure and technique are the same. When a drum has only circumferential joints, a separate test plate of the same material as that from which the shell was fabricated shall be welded as specified in paragraph (b) of this section.

(d) No test plates are required for nozzles when the drum has neither longitudinal nor circumferential welded joints.

(e) Drums fabricated of carbon-steel plate having circumferential joints but no longitudinal joints shall have at least one set of test plates welded separately for each drum or for each 50 feet of aggregate circumferential joints of drums of the same grade of material being welded in succession whose plate thicknesses fall within a range of ¼ inch, and whose diameters vary by not more than 6 inches.

(f) (1) When several class I pressure vessels fabricated of carbon-steel plate are being welded in succession or at any one time, the plate thicknesses of which fall within a range of ¼ inch, each 50 lineal feet of longitudinal and circumferential joints may be considered as the equivalent of one vessel for which test plates required by paragraph (a) or (b) of this section shall be furnished. Drums fabricated of carbon molybdenum grade E, F, or G marine boiler steel plate shall be welded separately and at least one set of test plates as required by paragraph (a) or (b) of this section shall be furnished for each drum.

(2) For class II pressure vessels no more than one set of test plates need be provided for each 300 lineal feet of either or both longitudinal and circumferential joints.

(g) Test plates shall be made by the same welder producing the longitudinal and circumferential joints. If more than one welder is employed in the welding of the pressure vessel(s), the test plates shall be made by the welder designated by the marine inspector. The test plates shall be of the same thickness as the material being welded and shall be of sufficient size to provide two specimens of each type required, except that in the case of pressure vessels having no longitudinal seams, the test plate need be only of sufficient length to provide one set of test specimens, and if a retest is necessary, an additional set of test plates may be welded separately.

(h) For test plates ¾ inch or less in thickness, one reduced-section tensile specimen and two free-bend specimens shall be tested. For plates exceeding ¾ inch in thickness, one reduced-section tensile specimen, one free-bend specimen and one guided side-bend specimen shall be tested.

(i) The test plates shall be so supported that the warping due to welding shall not throw the finished test plate out of line by an angle of over 5°.

(j) Where the welding has warped the test plates, the plates shall be straightened before being stress-relieved. The test plates shall be subjected to the same stress-relieving operation as required by § 56.01–70. At no time shall the test plates be heated to a temperature higher than that used for stress relieving the vessel.

(k) The bend specimens shall be taken from opposite sides of the reduced section tensile specimen in their respective test plates as shown in figures 56.05–1 (k1) and 56.05–1 (k2).

(l) In submitting the samples for test the manufacturer shall state the minimum and maximum tensile range of the base metal. If this information is not available, he shall submit a test coupon of the solid plate machined to form as shown in figure 51.04–10(a) of this subchapter.

(m) The external appearances of the welds and the amount of weld reinforcement shall conform to the requirements for fabrication, and the maximum reinforcement for the test plates shall not exceed the maximum permitted for construction.

(n) (1) The tension-test specimen of the joint shall be transverse to the welded joint and shall be of the full thickness of the plate after the weld reinforcement has been machined flush. The form and dimensions shall be as shown in figure 56.05–1 (n1). When the capacity of the available testing machine does not permit testing a specimen of the full thickness of the welded plate, the specimen may be cut with a thin saw into as many portions of the thickness as necessary, as shown in figure 56.05–1 (n2), each of which shall meet the requirements. The tensile strength of the joint specimen when it breaks in the weld shall not be less than the minimum of the specified tensile range of the plate used. If the specimen breaks in the plate at not less than 95 percent of the minimum specified tensile range of the plate and the weld shows no sign of weakness, the test is considered acceptable.

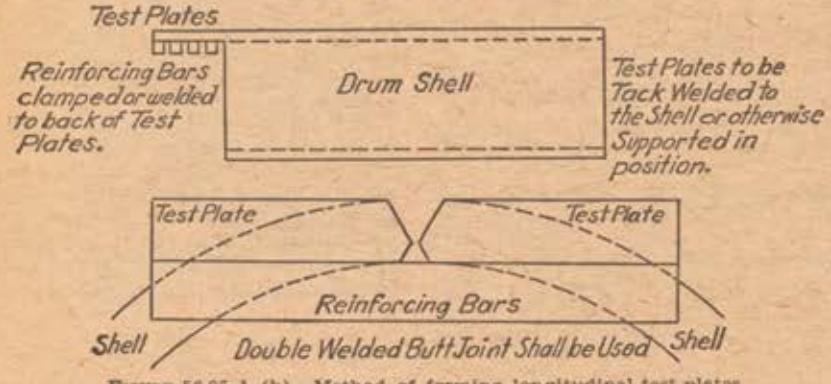


FIGURE 56.05–1 (b)—Method of forming longitudinal test plates.

(2) Boiler drums fabricated of plate of thicknesses of ⅝-inch or greater shall have a tension-test specimen of the weld metal machined to form as shown in figure 56.05–1 (n3) taken entirely from the deposited metal. The all-weld tension test specimen shall have a tensile strength of not less than the minimum of the range of the plate which is welded and shall have a minimum elongation in 2 inches of not less than 20 percent.

(o) The free bend specimens shall be of the form and dimensions shown in figure 56.05–1 (o). For plates of ¾ inch or less in thickness one of the specimens shall be bent with the face of the weld in tension. Each free bend specimen shall be bent cold under free-bending conditions until the elongation measured within or across approximately the entire weld on the outer surface of the bend is at least 30 percent. When the capacity of the available testing machine will not permit testing a full thickness specimen, the specimen may be cut with a thin saw into as many portions of the thickness as necessary, as shown in figure 56.05–1 (n2), provided each such piece retains the proportion of 1½ to 1, width to thickness, each of which shall meet the requirements. Cracks at the corners of the specimens or small defects in the convex surface, the greatest dimensions of which do not exceed ⅛ inch need not be considered as failures. For class II pressure vessels, the minimum elongation for the free bend specimen shall be 20 percent.

(p) The guided bend specimen shall be bent with the side of the weld in tension. Its width shall be equal to the full thickness of the plate and its thickness, after machining shall be 0.350 inch to 0.380 inch to permit bending in a jig having the contour of the standard jig as shown in figure 56.01–10(j6). The specimen shall withstand being bent cold to the full capacity of the jig without developing any crack exceeding ⅛ inch in any direction. Where the plate thickness exceeds 2 inches, the specimen shall be cut in two so that each portion does not exceed 2 inches in width. Each such portion shall be tested and shall meet the requirements.

(q) One retest shall be made for each of the original specimens which fails to meet the requirements. Should the retests fail to meet the requirements, the welds which they represent shall be chipped out, rewelded and new test plates provided. This shall apply to each shell in cases where a number of shells of the same design and grade of material are placed end to end and the longitudinal seams are welded continuously.

§ 56.05–3 Qualification of radiographic test procedure.

(a) Prior to the use of radiography by fabricators or commercial radiographic laboratories, the radiographic procedure proposed for use in nondestructive tests shall be qualified to demonstrate that the procedure will produce radiographs of acceptable standards.

(b) Radiographic test procedures qualified by the Bureau of Ships of the



FIGURE 56.05–1 (k1)—Test plates for material ¾ inch or less in thickness.

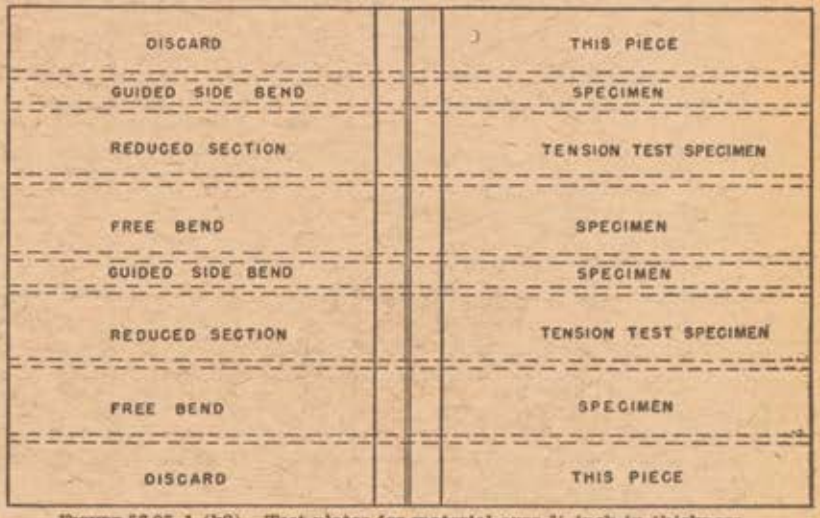


FIGURE 56.05–1 (k2)—Test plates for material over ¾ inch in thickness.

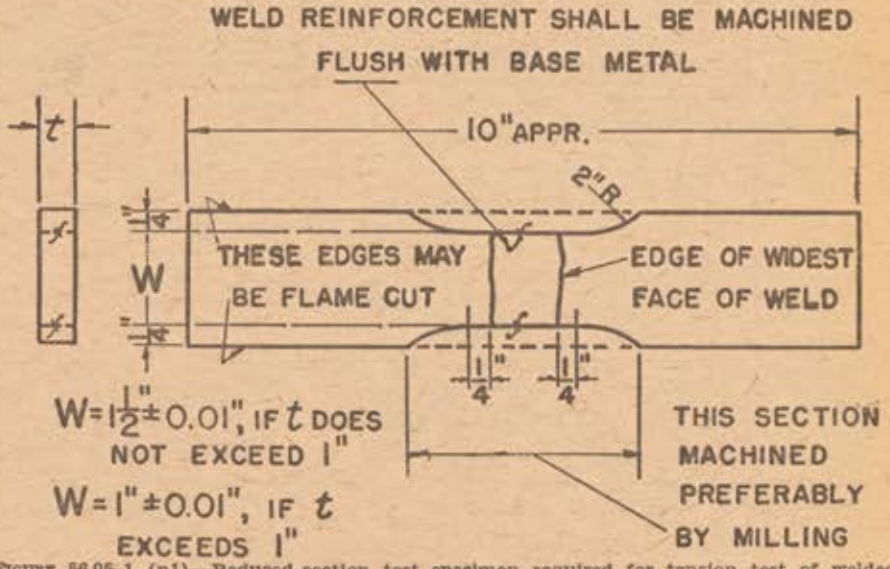


FIGURE 56.05–1 (n1)—Reduced-section test specimen required for tension test of welded joint.

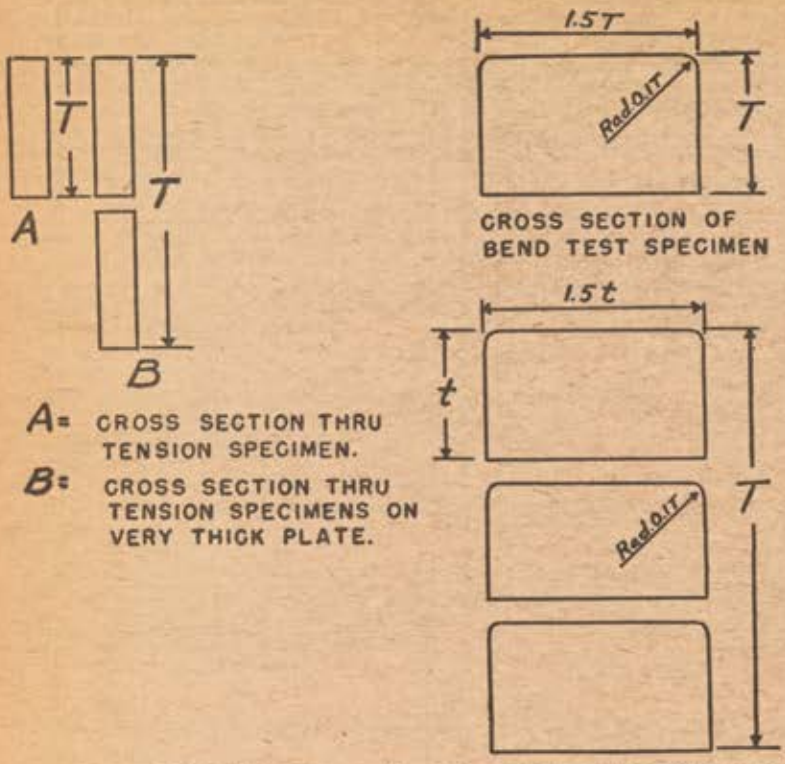


FIGURE 56.05-1 (n2)—Cross section of bend-test specimens from very thick plate.

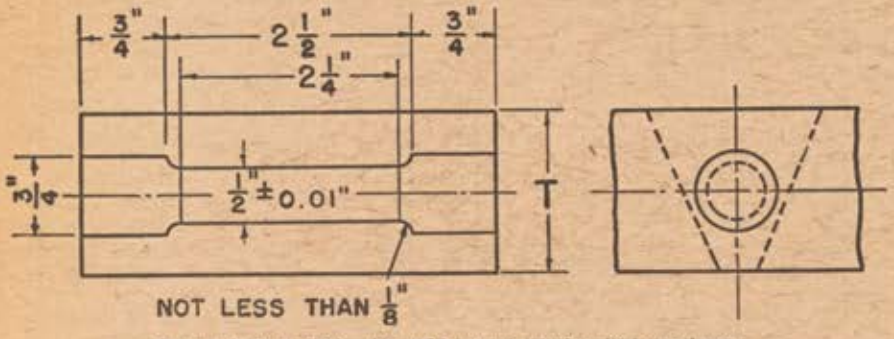


FIGURE 56.05-1 (n3)—All weld metal tension-test specimen.

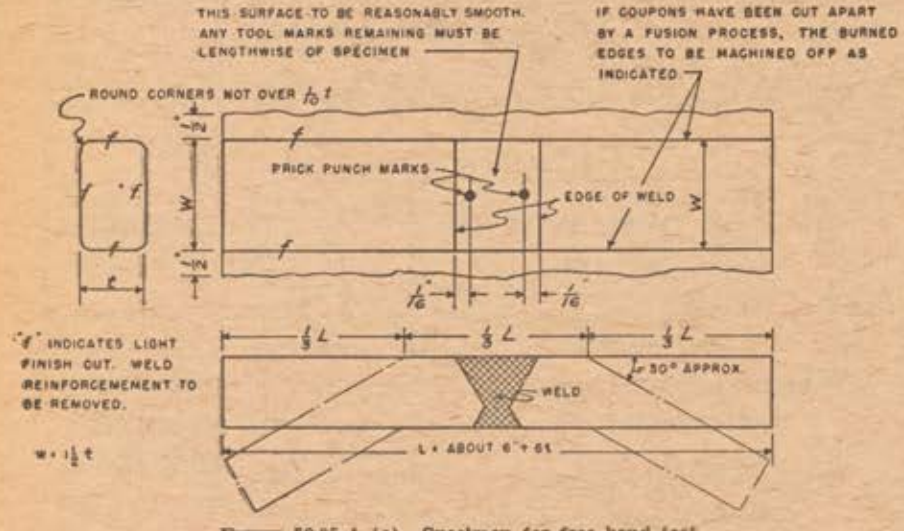


FIGURE 56.05-1 (o)—Specimen for free-bend test.

Department of the Navy need not be requalified.

(c) Radiographic test procedures shall be qualified in the following manner:

(1) Radiographs shall be taken of test plates in accordance with § 56.05-5. Two radiographs shall be taken for each test plate. The thickness range being qualified shall be in accordance with Table 56.05-3(c). Test plates shall contain defects of known size in addition to the required penetrameters. Test plates shall be furnished by the fabricator or laboratory seeking qualification.

TABLE 56.05-3(c)

Test plate thickness (Inches)	Thickness range qualified (Inches)
3/4	Up to 3/4.
1	3/4 to 1 1/2.
2	1 1/2 to 2 1/2.
3	2 1/2 to 4.
5	4 to 6.
8	6 to 10.
12	10 and over.

(2) The completed radiographs, together with the following information shall be forwarded, via the Officer in Charge, Marine Inspection, to the Commandant, for evaluation:

(i) Radiation source and capacity.

(ii) Film brand.

(iii) Type and thickness of screens.

(iv) d_e/t ratio, where d_e and t are defined in § 56.05-5(m).

(v) Description of test plates.

(vi) Processing technique.

(d) Test plates of various thicknesses may be made up by placing several rolled mild steel plates together, with the plate containing the defects on the radiation source side.

(e) Separate qualification tests are required for each type of radiation source to be used, and for plate and pipe radiography.

§ 56.05-5 Nondestructive tests.

(a) (1) All longitudinal and circumferential welded butt-joints of Class I welded pressure vessels shall be examined throughout their entire length, except as specifically exempted in other sections of this subchapter, by means of radiography, preferably by X-ray.

(2) Each welded butt-joint of Class II welded pressure vessels shall be examined throughout its entire length by means of radiography, preferably by X-ray, when the plate thickness at the welded joint exceeds 1½ inches, or when required by § 54.03-1 of this subchapter and Table 56.01-30(a).

(b) (1) All butt-welded joints of Class I piping, unless exempted by § 56.01-80, shall be nondestructively tested. Radiography shall be used for diameters or thicknesses as follows:

(i) Carbon steel when the pipe wall thickness exceeds ⅜ inch.

(ii) Alloy steel when the diameter is 4 inches or larger.

(2) Butt-welded joints of Class I piping of thicknesses and sizes not exceeding that specified in subparagraph (1) of this paragraph may be examined by means of magnetic particle testing. The surfaces to be inspected shall be clean,

dry, and free from oil, excessive rust, slag, and scale accumulation. All surface irregularities such as undercuts, overlaps, ripples, rough welds, etc., which may make interpretation of the magnetic indications difficult, shall be made smooth by grinding, chipping, or sandblasting.

(c) Welded joints to be radiographed shall be prepared as follows:

(1) The welded joints shall be representative of the completed weld to be placed in service.

(2) The weld ripples or weld surface irregularities, on both inside and outside, shall be removed by any suitable mechanical process to a degree such that the resulting radiographic contrast due to any remaining irregularities cannot mask or be confused with that of any objectionable defect.

(3) The finished surface of the reinforcement may have a crown of smooth contour not exceeding the following:

Material thickness, inches:	*Maximum thickness of reinforcement, inches*
½ and below	1/16
Over ½ to 1, inclusive	3/32
Over 1 to 2, inclusive	1/8
Over 2	5/32

(4) Single-welded butt-joints made the equivalent of double-welded butt-joints in accordance with § 56.01–55 may be radiographed without removal of the backing strip provided the backing strip image will not interfere with the interpretation of resultant radiographs.

(d) Radiographic examination shall be performed with a technique that will indicate the presence of defects having depths of 2 percent of the thickness of the material, or widths of 4 percent of the thickness of the material being examined. Penetrameters made of material having radiographic density approximately the same as that of the material being radiographed shall be used to determine the sensitivity of the radiographic technique being employed.

(e) Penetrameters of the type as shown in Figure 56.05–5(e) shall be used, and shall be placed on the radiation source side of the object being radiographed. All radiographs shall show the image of the penetrameter.

(f) Each penetrameter shall have three holes of diameters equal respectively to one, two, and four times the penetrameter thickness, but in no case less than .010 inch for the 1T hole, .020 inch for the 2T hole, and .040 inch for the 4T hole. The 2T hole shall be distinguishable on the radiograph.

(g) Each penetrameter shall carry an identifying number representing, to two significant figures, the minimum thickness of plate for which it may be used. The images of the identifying numbers shall appear clearly on the radiographs.

(h) The thickness of the penetrameter shall be not more than 2 percent of the thickness of the material being examined. When the weld reinforcement and/or backing strip is not removed, a shim shall be placed under the penetrameter, such that the total thickness being radiographed under the penetrameter is the same as the total thickness through the weld, including backing strip when not removed.

(i) For metals of uniform thickness, each radiograph taken of welds shall have visible penetrameters and identification markers as follows:

(1) When the dimension of the film in the direction of the weld is 6 inches or less, one penetrameter is required.

(2) When the dimension of the film in the direction of the weld is over 6 inches, 2 penetrameters are required.

(3) The penetrameter(s) shall be placed at the end(s) of the exposed length, parallel and adjacent to the weld seam with the smallest hole at the outer end. When a single penetrameter is used, it shall be placed at the end of maximum angularity when there is a difference of angularity of radiation at the ends.

(4) For assembly welds, at least 2 identification markers are required. The distance between any two adjacent identification markers shall be not more than 6 inches.

(j) For metals of non-uniform thickness, such as castings, each radiograph taken shall have visible penetrameters as follows:

(1) Where the thickness of the metal does not vary over the area covered by a single radiograph by more than 50 percent of the maximum thickness or by more than ½ inch in thickness, whichever is the lesser, one penetrameter shall be used which shall be located at a point of mean thickness. In all cases where the longest dimension of a radiograph exceeds 6 inches, two penetrameters shall be used.

(2) If the thickness of metal covered by a single radiograph varies by more than 50 percent of the maximum thickness or by more than ½ inch, whichever is the lesser, suitable penetrameters shall be placed at the thinnest and thickest portion of the material being radiographed.

(3) Where the above requirements for placement on either the mean or maximum and minimum thickness permits, the penetrameter(s) shall be placed at the point(s) of maximum angularity of radiation.

(k) When an isotope capsule is placed at the center of a circumferential joint and the complete circumference radiographed with a single exposure, four penetrameters, uniformly spaced, shall be employed.

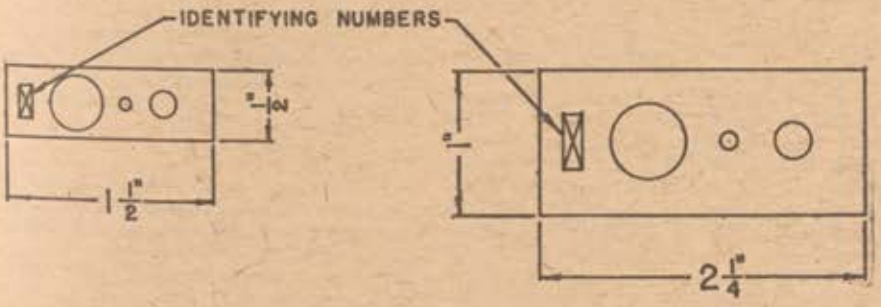
(l) Radiographic film for the inspection of welded joints or of weld repairs shall be high-contrast, slow speed, fine grain, or extra-fine grain, and used with lead screens. All radiographs shall be free from excessive mechanical processing defects which would interfere with the proper interpretation of the radiograph.

(m) The film during exposure shall be as close to the surface of the weld as practicable. Except where specifically provided for in the process qualification, the d_s/t ratio shall be 7 or greater; where d_s is the distance from the source of radiation to the surface of the test object toward the radiation source, and t is the distance from the remotest part of the test object surface toward the radiation source to the film.

(n) Identification markers, the image of which is to appear on the film, shall be placed adjacent to the weld and their locations accurately and permanently marked near the weld on the outer surface of the plate or pipe, so that a defect appearing on the radiograph may be accurately located on the actual weld.

(o)(1) When radiographing a circumferential pipe joint or a casting by placing the radiation source inside the object, and where it is not feasible to place the penetrameters on the radiation side of the weld, the penetrameters may be placed on the film side if the requirements of subparagraph (2) of this paragraph are met.

(2) The radiographic technique shall be demonstrated with the applicable penetrameter placed on the source side and a continuous series of penetrameters placed on the film side of a like pipe section. The series of penetrameters shall range in thickness from 2 percent to 0.5 percent of the material thickness. If the penetrameter on the source side indicates the required sensitivity, the image of the smallest penetrameter hole visible on the film side shall be used to determine the penetrameter and pene-



DIAMETERS OF HOLES 1, 2, AND 4 TIMES THE THICKNESS OF PENETRAMETER.

FIGURE 56.05–5(e)—Details of penetrameters.

trameter hole which shall be used on inspection radiographs.

(p) For double wall radiographs in which only the portion of the weld next to the film is examined, and it is desired to place the penetrameter on the film side, the radiographic technique shall be demonstrated on a similar pipe section with the applicable penetrameter placed on the inside of the pipe along the root of the weld and a series of penetrameters, selected as in subparagraph (o)(2) of this section, placed on the film side. If the penetrameter on the source side of the portion of the weld indicates the required sensitivity, the image of the smallest penetrameter hole visible on the film side shall be used to determine the penetrameter and penetrameter holes which shall be used on inspection radiographs.

(q) The radiographs shall be submitted to the marine inspector with data as follows:

(1) The thickness of the metal being examined.

(2) The d_s/t ratio.

(3) The X-ray voltage or isotope used.

(r) The acceptability of welds examined by radiography shall be judged by the following standards:

(1) Welds in which the radiographs show elongated slag inclusions or cavities are unacceptable if the length of any such imperfection is greater than $1/3T$ where T is the thickness of the thinner plate welded. If several imperfections within the above limitations exist in line, the welds shall be judged acceptable if the sum of the longest dimensions of all such imperfections is not more than T in a length of $12T$ and if the defects are separated by at least $6L$ of acceptable weld metal, where L is the length of the longest imperfection. The maximum length of acceptable inclusion for any plate thickness shall be ¾ inch. Any slag inclusion shorter than ¼ inch shall be acceptable for any plate thickness.

(2) Welds in which the radiographs show any type of crack or zones of incomplete penetration shall be unacceptable. Incomplete penetration appears as elongated darkened lines of varying length and width in any part of the welding groove.

(3) Welds in which the radiographs show porosity shall be judged as acceptable or unacceptable by comparison with a standard set of radiographs, copies of which are on file at Coast Guard Headquarters, with the Coast Guard District Commanders, and with the Officers in Charge, Marine Inspection.

§ 56.05–6 Spot examination of welded joints.

(a) *Scope.* (1) All class II welded unfired pressure vessels which are not given a complete radiographic examination as specified by § 56.05–5 shall have portions of the finished welded joints examined by spot radiography, except vessels meeting the requirements of subparagraph (2) of this paragraph need not be so examined.

(2) Spot examination specified by subparagraph (1) of this paragraph is not required when an allowable stress of 80 percent of the values given in table 52.05–10(a) in Part 52 and table 54.03–10(c) in Part 54 of this subchapter is used in the design of the vessel.

(b) *Number required.* At least one spot shall be examined on each vessel welded having 50 feet or less of combined longitudinal and circumferential welds. For vessels having more than 50 feet of combined longitudinal and circumferential joints at least one spot shall be examined for each 50 feet or less of welded joints. If more than one welding procedure is employed or if more than one welder does the welding on a vessel, at least one spot shall be examined for each procedure and each welder. The spot(s) examined may be considered representative of the procedure, the welder and one interval of 50 feet of welded joint. The spot(s) to be examined shall be designated by an inspector.

(c) *Spot radiographing.* Each spot required by paragraph (b) shall be examined by radiography as prescribed in § 56.05–5. The spot radiographs shall meet the standards given in § 56.05–5 (q). Retest radiographs permitted by paragraph (d) of this section shall comply with the standards given therein. Films of spot radiographs which have been examined by the inspector may be destroyed.

(d) *Retests*—(1) *Spot examination.* When a spot has been examined and the welding does not comply with the minimum quality requirements prescribed in paragraph (c) of this section, two additional spots shall be examined in the same joint at locations to be designated by the inspector, one on each side of and not far from the initial spot to determine the limits of defective welding, and if the welding at either of these spots fails to meet the minimum requirements of subparagraph (2) of this paragraph, additional nearby spots shall be examined until the limits of unacceptable welding are determined. In addition, the inspector shall require that an additional spot be examined at one location to be selected by him in each joint not previously examined on which the same welder has welded and if any additional spot fails to comply with the minimum quality requirements of paragraph (c) of this section, the limits of unacceptable welding shall be determined as described in this section. All rewelded areas shall be re-examined as required by the inspector and shall comply with the prescribed requirements in this section.

(2) *Radiographic standard for retest.* Welds in which the radiographs show any type of cracks or zones of incomplete penetration shall be unacceptable. Welds in which radiographs show elongated slag inclusions, cavities, or lack of fusion shall be unacceptable if the length of such imperfection is greater than 2/3T, where T is the thickness of the thinner plate. If several imperfections within the above limitations exist in line, the welds shall be judged acceptable if the sum of the longest dimension of all such imperfections is not more than T in length of 6T, and if the defects are separated by at least 6L of acceptable welding, when L is the length of the longest imperfection. The maximum permissible porosity shall not exceed that permitted by § 56.05–5, except that not more than twice as many cavities or slag inclusions, but of no greater size, shall be permitted within any single square inch of film area, or for the whole film area.

Subpart 56.10—Brazing

§ 56.10–1 Definition.

Brazing is a group of metal-joining processes wherein the filler metal is a nonferrous metal or alloy whose melting point is higher than 800° F. but lower than that of the metals or alloys to be joined and is caused to flow, chiefly by capillarity, into the space between the two closely lapped or butted surfaces to be joined.

§ 56.10–5 Detail requirements.

(a) Unfired pressure vessels and pipe may be fabricated by brazing when the temperature to which such connections may be subjected does not exceed 425 degrees F.

(b) A manufacturer desiring to fabricate unfired pressure vessels shall conduct a process qualification test to demonstrate to an inspector that he has the proper equipment and his procedure is satisfactory for the production of acceptable work.

(c) The edges of the members to be joined shall be properly cleaned and made free from oxides, dirt, oil or grease prior to brazing. The edges of the plates may be punched and stitch riveted with centers not to exceed 3 inches or resistance welded with centers of spot welds not to exceed 1½ inches to hold the faying surfaces tightly together. The brazing shall be done by placing the flux and brazing material on one side of the joint and applying heat until the brazing material flows entirely through the lap and shows uniformly along the seam on the other side of the joint. Sufficient flux shall be used to cause the brazing to appear promptly after reaching the brazing temperature. The brazing material used shall have a shearing strength of at least 10,000 p. s. i.

(d) After the parts to be joined have been thoroughly cleaned the edges of same shall be given an even coating of flux prior to heating as a protection against oxidation.

(e) Heads shall be inserted into the shell with a tight drive or shrink fit and the protruding ends of the shell shall then be heated to a forging heat and crimped over the head.

§ 56.10–10 Materials.

Ferrous and nonferrous material for use in the fabrication of shells and heads of unfired pressure vessels shall comply with any of the grades of material specified in Part 51 of this subchapter. Steel pipe may be used for shells provided same is manufactured of seamless drawn or electric-resistance welded pipe.

§ 56.10–15 Thickness and maximum allowable pressure.

(a) The maximum allowable pressure for shells of brazed pressure vessels shall

be determined by § 52.05–10 of this subchapter.

(b) The maximum allowable pressure for heads of brazed pressure vessels shall be determined by §§ 52.20–10 and 52.22–10 of this subchapter.

(c) The maximum allowable pressure for brazed piping shall be determined by § 55.07–5 of this subchapter.

§ 56.10–20 Types of joints.

(a) The longitudinal joint may be of the lapped type where the material thickness does not exceed ⅜ inch. For thickness exceeding ⅜ inch, but not to exceed 1 inch, the longitudinal joint shall be of the double-butt strap type.

(b) Lap joints shall have the edge of the plate lapped a distance not less than eight times the plate thickness and for double-butt joints the lap of the inner and outer strap shall be not less than 16 times the thickness of the shell plating, one-half the lap to be on each side of the abutting plate edges. When the brazed joint does not extend the full length of the plate, the unbrazed edges may be arc- or gas-welded provided the length of the weld is not greater than four times the thickness of the shell plate from the edge of the flange of the head.

(c) Head and circumferential joints shall be brazed in approximately the same manner as the longitudinal joint. The end of the plate shall have an overlap of not less than four times the shell thickness. When a vessel is fabricated with more than one course in the shell, the circumferential joint may be of either the lap or butt type. If of the latter type, the courses shall be approximately a true circle and the circumference of the abutting courses shall not vary by more than 0.20 percent. The sleeve may be fitted to either the inside or the outside of the shell. The overlap in either case for each course shall be not less than four times the shell thickness.

§ 56.10–25 Pipe joints.

(a) Copper-alloy brazing may be employed to join pipe, valves, and fittings. Circumferential joints may be either of the butt or socket type. Where butt joints are employed, the included angle shall be not less than 90° where the wall thickness is 5/16 inch or greater. The annular clearance of socket joints shall be held to small clearances which experience indicates is satisfactory for the brazing alloy to be employed, method of heating, and material to be joined. The annular clearance shall be shown on drawings submitted for approval of socket joints.

(b) Copper pipe fabricated with longitudinal joints for pressures not exceeding that permitted by Part 55 of this subchapter, may have butt, lapped, or scarfed joints. If of the latter type, the kerf of the material shall be not less than 60°.

§ 56.10–30 Silver brazing.

(a) Circumferential pipe joints may be either of the socket or butt type. When butt joints are employed the edges to be joined shall be cut or machined square and the edges shall be held closely together to insure a satisfactory joint.

(b) The surfaces of the members to be joined shall be properly cleaned and given a coating of flux as required by § 56.10–5.

(c) Heat shall be applied evenly and uniformly to all parts of the joint in order to prevent local overheating.

(d) The members to be joined shall be held firmly in place until the silver brazing alloy has set so as to prevent any strain on the joint until the brazing alloy has thoroughly solidified.

(e) Clearances shall be between 0.002 inch minimum and 0.006 inch maximum.

PART 57—MAIN AND AUXILIARY MACHINERY

Subpart 57.01—General Requirements

Sec.

57.01–1 Scope.
57.01–5 Applicable standards.
57.01–10 Fuel for internal combustion engines on passenger vessels.
57.01–15 Fuel oil for boilers.

Subpart 57.05—Main Propulsion Machinery

57.05–1 Material, design and construction.
57.05–5 Astern power.

Subpart 57.10—Internal Combustion Engine Installations

57.10–1 Scope.
57.10–5 Gasoline engine installations.
57.10–10 Diesel engine installations.
57.10–15 Gas turbine installations.

Subpart 57.20—Refrigerating Machinery

57.20–1 Installation of refrigerating machinery.
57.20–5 Small portable, self-contained units.

Subpart 57.25—Steering Apparatus

57.25–1 Steering apparatus; existing installations.
57.25–5 Steering apparatus; new installations.
57.25–10 Rudder movement.
57.25–15 Plan approval.
57.25–20 Power-driven steering gear.
57.25–25 Auxiliary means of steering.
57.25–30 Steadying the rudder.
57.25–35 Rudder stops.
57.25–40 Buffers.
57.25–45 Pilothouse steering gear controls.
57.25–50 Alternative steering station steering gear controls.
57.25–55 Duplicate pilothouse steering gear controls systems.
57.25–60 Arrangement of steering wheels.
57.25–65 Special steering apparatus.
57.25–70 Steering gear piping.

Subpart 57.30—Nuclear Energy

57.30–1 Scope.
57.30–5 Definitions.
57.30–10 General safety requirements.
57.30–15 Special operating procedures.
57.30–20 Inspection, overhaul, and repairs.
57.30–25 Radiation protection.
57.30–30 Safety Assessment.
57.30–35 Operating Manual.

AUTHORITY: The provisions of this Part 57 issued under R.S. 4405, as amended, 4462, as amended; 46 U.S.C. 375, 416. Interpret or apply R.S. 4399, as amended, 4400, as amended, 4417, as amended, 4417a, as amended, 4418, as amended, 4421, as amended, 4426–4431, as amended, 4433, as amended, 4434, as amended, 4453, as amended, 4488, as amended, 4491, as amended, sec. 14, 29 Stat. 690, as amended, sec. 10, 35 Stat. 428, as amended, 41 Stat. 305, as amended, secs. 1, 2, 49 Stat. 1544, 1545, as amended, sec. 17, 54 Stat. 166, as amended, sec. 3, 54 Stat. 347, as amended, sec. 3, 70 Stat. 152, sec. 3, 68 Stat. 675; 46 U.S.C. 361, 362, 391, 391a, 392, 399, 404–409, 411, 412, 435, 481, 489, 366, 395, 363, 367. 526p, 1333, 390b, 50 U.S.C. 198; E.O. 11239, July 31, 1965, 30 F.R. 9671, 3 CFR, 1965 Supp. Treasury Department Orders 120, July 31, 1950, 15 F.R. 6521; 167–14, Nov. 26, 1954, 19 F.R. 8026; 167–20, June 18, 1956, 21 F.R. 4894; CGFR 56–28, July 24, 1956, 21 F.R. 5659; 167–38, Oct. 26, 1959, 24 F.R. 8857, unless otherwise noted.

Subpart 57.01—General Requirements

§ 57.01–1 Scope.

(a) The regulations in this part contain requirements for the design and construction of main and auxiliary machinery installed on vessels subject to inspection by the Coast Guard, except as otherwise prescribed in this subchapter.

§ 57.01–5 Applicable standards.

In general the applicable standards established by the American Bureau of Shipping may be considered as standard for the design, construction, and testing of main and auxiliary machinery, except as modified in this subchapter.

§ 57.01–10 Fuel for internal combustion engines on passenger vessels.

(a) All internal combustion engines, whether used for main propulsion or auxiliaries, installed on passenger vessels exceeding 100 gross tons, or on all passenger vessels engaged in international voyages, shall be driven by fuel having a flashpoint exceeding 110 degrees F.

§ 57.01–15 Fuel oil for boilers.

Oil to be used as fuel to be burned under boilers on vessels subject to inspection by the Coast Guard shall have a flashpoint of not less than 150 degrees F. (Closed cup test.)

Subpart 57.05—Main Propulsion Machinery

§ 57.05–1 Material, design and construction.

The material, design, construction and workmanship of main and auxiliary machinery shall be at least equivalent to the standards established by the American Bureau of Shipping or other recognized classification society.

§ 57.05–5 Astern power.

(a) All vessels shall have sufficient power for going astern to secure proper control of the ship in all normal circumstances.

Subpart 57.10—Internal Combustion Engine Installations

§ 57.10–1 Scope.

The requirements in this subpart apply to all vessels subject to inspection. The requirements governing the installation of internal combustion engines on motorboats and motor vessels of more than 15 gross tons carrying passengers

for hire shall be effective on new vessels or vessels converted to passenger service for the first time, the construction of which is commenced on or after December 1, 1945, and to all existing vessels as far as it is practicable.

§ 57.10–5 Gasoline engine installations.

(a) *Engine design.* All installations shall be of marine type engines suitable for the intended service, designed and constructed in conformance with the requirements of this subchapter.

(b) *Carburetors.* (1) Drip collectors shall be fitted under all carburetors, except the down-draft type, to prevent fuel leakage from reaching the bilges and so arranged as to permit ready removal of such fuel leakage. Drip collectors shall be covered with flame screens.

(2) All gasoline engines shall be equipped with an approved means of backfire flame control. Installations of backfire flame arresters or engine air and fuel induction systems bearing basic Approval No. 162.015 may be continued in use as long as they are serviceable and in good condition. Backfire flame arresters or engine air and fuel induction systems installed or used on new installations or as replacements shall be of an approved type, design, construction, and tested in conformance with applicable requirements in Subpart 162.041 or 162.042 of Subchapter Q (Specifications) of this chapter. Air intakes shall be so directed that backfire cannot blow down into the bilge.

(c) *Exhaust manifold.* The exhaust manifold shall either be water-jacketed and cooled by discharge from a pump which operates whenever the engine is running, or woodwork within 9 inches shall be protected by ¼-inch asbestos board covered with not less than No. 22 USSG galvanized sheet iron or nonferrous metal. A dead air space of ¼ inch shall be left between the protecting asbestos and the wood, and a clearance of not less than 2 inches maintained between the manifold and the surface of such protection.

(d) *Exhaust pipe.* (1) The exhaust pipe shall be gastight and the installation shall comply with one of the following requirements:

(i) All of the engine cooling water shall be discharged through the exhaust pipe when water cooled and shall enter the exhaust pipe at a point as near to the manifold as practicable.

(ii) A length of not less than 12 diameters of the exhaust pipe adjacent to the manifold shall be water-jacketed and cooled in the same manner as the manifold. The remainder of the pipe shall be kept clear of internal woodwork at least 1½ inches.

(iii) Woodwork within 6 inches of any part of the exhaust pipe shall be protected by ¼-inch asbestos board covered with not less than No. 22 USSG galvanized sheet iron or nonferrous metal. A dead air space of ¼ inch shall be left between the protecting asbestos and the wood, and a clearance of not less than ½ of its diameter shall be maintained between the pipe and the surface of such protection.

(2) In all of the above cases described in subparagraph (1) of this paragraph, the exhaust pipe shall be properly supported by noncombustible hangers or blocks and protective gratings shall be provided at such locations where persons or gear might come in contact therewith. Arrangements shall be made to provide access to the exhaust pipe throughout its length. A spark arrester shall be installed in each exhaust line.

(3) Where exhaust lines pass through watertight bulkheads, noncombustible packings shall be installed. Exhaust piping shall be led to the point of escape without traps and with a minimum number of bends or elbows in order to reduce the effect of back pressure.

(4) Where flexibility is necessary, a section of flexible metallic hose may be used. Suitable non-metallic hose may be used if the exhaust is watercooled.

§ 57.10–10 Diesel engine installations.

(a) The requirements of § 57.10–5 (a), (c) and (d) shall apply to diesel engine installations.

(b) On installations of engines of the semi-diesel or hot-bulb type, woodwork within 3 feet of starting torches shall be protected by at least ¼-inch asbestos board covered with sheet metal and a dead air space of at least ¼ inch between the asbestos board and the wood.

§ 57.10–15 Gas turbine installations.

(a) The design, construction, workmanship and tests of gas turbines and their associated machinery shall be at least equivalent to the standards of the American Bureau of Shipping or other recognized classification society.

(b) The materials used for gas turbine installations shall have properties suitable for the intended service. When materials not conforming to standard A.S.T.M. specifications are employed, data concerning their properties including high temperature strength data where applicable, shall be furnished.

(c) (1) Gas turbine exhaust piping will be considered to be Class II piping under the provisions of § 55.01–1 of this subchapter, except for installations where the exhaust pressure exceeds 150 p.s.i., such as in closed cycle systems. Where exhaust ducting is employed, the drawings and design data shall be submitted to substantiate its suitability and safety for the intended service.

(2) Where considered necessary, gas turbines and associated exhaust systems shall be suitably insulated or cooled, by means of lagging, water jacketing, water spray, or a combination thereof.

(3) Where specifically approved by the Commandant, exhaust lines of gas turbines may be interconnected with boiler uptakes, provided dampers or other suitable devices are provided to prevent backflow of boiler exhaust gases into the turbine.

(d) The air inlet shall be designed and equipped as necessary for the safety of personnel and to prohibit the entrance of harmful foreign material, including water, into the system.

(e) The noise level in the vicinity of any part of the installation shall be kept at or below the levels as prescribed in Department of the Navy, Bureau of Ships' Specifications, Section S1–10, or other approved standards.

(f) Means shall be provided for circulating air, either natural or forced, through the engine compartment for cooling and ventilation.

(g) (1) The control system shall be designed for automatic shutdown of the engine under the following conditions:

(i) Overspeed.

(ii) Excessive exhaust gas temperature.

(iii) Excessive lubricating oil temperature.

(iv) Low lubricating oil pressure.

(2) Audible or visible alarms shall be provided in the gas temperature control system and in the lubricating oil control system. Such alarms shall be actuated prior to or upon automatic shutdown.

(3) A remote, manually operated shutdown device shall be provided. Such device may be totally mechanical or may be electrical with a manually actuated switch.

(h) Drawings and design data of the following components shall be submitted to substantiate their suitability and safety for the service intended:

(1) Combustion chamber.

(2) Regenerator or recuperator.

(3) Casing or piping conveying the gas from the combustion device to the gas turbine.

(i) Gas turbine fuel systems shall meet, in general, the requirements of Part 55 of this subchapter.

Subpart 57.20—Refrigerating Machinery

§ 57.20–1 Installation of refrigerating machinery.

(a) Where refrigerating machines are installed in which anhydrous ammonia is used as a refrigerant, such machines shall be located in a well-ventilated, isolated compartment, preferably on the deck, but in no case shall it be permissible to install such machines in the engineroom space unless it is vented and isolated so as to eliminate any hazard from gas escaping to the engineroom. Absorption machines using a solution of aqua ammonia and machines using carbon anhydride (CO_2 gas) are exempt from this requirement, provided the maximum charges that might be released in the event of breakage do not exceed 300 pounds.

(b) Machinery compartments containing equipment for ammonia shall be fitted with a sprinkler system providing an effective water spray and having a remote control device located outside the compartment.

(c) All refrigeration compressor spaces shall be effectively ventilated and drained and shall be separated from the insulated spaces by watertight bulkhead, unless otherwise approved.

§ 57.20–5 Small portable, self-contained units.

The requirements of this subpart shall not apply to small, portable, self-contained units.

Subpart 57.25—Steering Apparatus

§ 57.25–1 Steering apparatus; existing installations.

(a) All existing vessels subject to inspection by the Coast Guard shall be provided with suitable steering apparatus. Extra steering apparatus consisting of relieving cables, or of auxiliary power- or hand-steering gear attached to the rudder stock independent of the regular steering gear, shall be provided.

(b) Replacements of steering apparatus on existing vessels shall be in accordance with this subpart for new installations.

§ 57.25–5 Steering apparatus; new installations.

(a) All new vessels subject to inspection by the Coast Guard, except certain towed barges, shall be provided with main and auxiliary steering apparatus in accordance with §§ 57.25–10 to 57.25–70, inclusive.

(b) The main steering gear shall be of adequate strength and of sufficient capacity to steer the vessel at maximum service speed. The main steering gear and rudder stock shall be so designed that they are not damaged at maximum astern speed.

(c) The auxiliary steering gear shall be independent of the main steering gear and shall be of adequate strength and of sufficient capacity to steer the vessel at navigable speed and capable of being brought speedily into action in an emergency.

(d) When the steering gear is power operated, the exact position of the rudder shall be indicated at the main steering station.

§ 57.25–10 Rudder movement.

(a) The main steering gear shall be capable of putting the rudder over from 35 degrees on one side to 35 degrees on the other side with the vessel running ahead at the maximum continuous rated shaft R.P.M. The timing may be conducted from 35 degrees on one side through 30 degrees on the other side, and the average rate of the rudder shall be not less than 2⅓ degrees per second.

(b) The auxiliary steering gear where power-driven shall be capable of putting the rudder over from 15 degrees on one side to 15 degrees on the other side in 60 seconds with the vessel running ahead at half speed, or 7 knots, whichever is greater.

§ 57.25–15 Plan approval.

(a) General arrangement plans of the main and auxiliary steering arrangements and piping systems shall be submitted to the Commandant (MMT), U.S. Coast Guard, Washington, D.C., 20226, for approval.

§ 57.25–20 Power-driven steering gear.

(a) The main steering gear shall be power-driven for vessels over 250 feet in length or when the required upper rudder stock diameter is over 9 inches. However, power-driven main steering gear shall be required for any vessel where the hand steering gear is not considered capable of effectively complying with the requirements of § 57.25–10.

(b) The auxiliary steering gear shall be power-driven when the required upper rudder stock diameter is over 9 inches for passenger vessels and over 14 inches for cargo vessels.

§ 57.25–25 Auxiliary means of steering.

(a) An auxiliary means of steering will not be required where the main gear is of the dual-power hydraulic type, having two independent pumps and connections and separate leads to the pump prime movers from the source of power, and each independent steering gear power-unit has the required capacity for a main steering gear in order to meet the requirements of § 57.25–10(a). In such cases the attachment to the rudder stock shall be designed for strength in excess of that of the rudder stock.

(b) A suitable arrangement of block and tackle will be acceptable as an auxiliary steering means, and when arranged for operation by means of power-driven winches or similar machinery, will be considered an auxiliary power steering gear.

(c) An auxiliary means of steering will not be required on double-ended ferryboats where independent steering gears are fitted at each end of the vessel, and two sources of power are provided where the gear is power-driven.

§ 57.25–30 Steadying the rudder.

(a) All oceangoing vessels requiring power gears shall be provided with arrangements for steadying the rudder in the event of an emergency and when a change of gear is required. On hydraulic type steering gears a suitable arrangement of stop valves in the main piping may be considered as a means of steadying the rudder.

§ 57.25–35 Rudder stops.

(a) Main power steering gear shall be provided with positive arrangements for stopping the gear before the rudder stops are reached. These arrangements shall be synchronized with the rudder stock or the position of the gear itself, rather than with the steering gear control system.

(b) Strong and effective rudder stops are to be fitted. Where adequate positive stops are provided within the gear, structural stops wil not be required.

§ 57.25–40 Buffers.

(a) On vessels in ocean, coastwise, and Great Lakes service, steering gears other than the hydraulic type chall be designed with suitable buffer arrangements to relieve the gear from shocks to the rudder.

§ 57.25–45 Pilothouse steering gear controls.

(a) Control of the main steering gear shall be provided from the pilothouse by mechanical, hydraulic, electrical, or other approved means. The arrangement of the control system and steering gear components shall provide full followup control of the rudder. Supplementary steering control not employing full followup may also be provided from the pilothouse.

(b) Any power required for the pilothouse steering control systems shall be supplied from the steering gear room. Means shall be provided in the steering gear room to disconnect the steering control system from the power source.

§ 57.25–50 Alternative steering station steering gear controls.

(a) An alternative steering station shall be provided from which control of the main steering gear can be effected by mechanical, hydraulic, electrical, or other approved means. The alternative steering station shall be located on the after weather deck unless duplicate pilothouse control means are provided in accordance with § 57.25–55. The arrangement of the alternative steering control system and the steering gear components shall provide full followup control of the rudder unless a suitable rudder angle indicator is provided at the alternative steering station.

(b) Means shall be provided to enable orders to be transmitted from the pilothouse to the alternative steering station.

(c) Components of the alternative steering station control system shall be completely separate and independent of the pilothouse steering control system. The shafting, piping, or electrical cable associated with the control means at the alternative steering stations shall be run as widely separated as practicable from the shafting, piping, or electrical cable of the pilothouse steering control systems.

(d) Any power required for the alternative steering control means shall be supplied from the steering gear room. Means shall be provided in the steering gear room to disconnect the alternative steering means from the source of power and, if necessary, from the associated steering gear.

(e) Where it is not practicable to comply with the requirements of this section because of the arrangement of the vessel or the type of steering gear installed, other types of steering gear control systems may be considered. Such systems shall provide steering gear control equivalent to that required by this section. Ease of maintenance, accessibility, and location and arrangement of components, as well as the type of control system, will be among the factors evaluated when determining equivalency.

§ 57.25–55 Duplicate pilothouse steering gear controls systems.

(a) Two separate and independent steering control systems shall be provided for controlling the steering gear from the pilothouse when the alternative steering means is not located on the after weather deck.

(b) Duplicate pilothouse steering gear controls, when installed, shall comply with the following requirements:

(1) Where the steering gear is power-driven, the arrangements of the equipment shall be such that full followup control of the rudder is provided with either of the control systems in use. Supplementary steering control not employing followup may be incorporated.

(2) Means shall be provided in the pilothouse to select either of the two con-

trol systems to be in control of the rudder. An "off" position which will disconnect power to both systems may be provided in the pilothouse. Interlocks shall be provided for this control system selector so that only one may be in use at a time.

(3) Any power required for the pilothouse steering control systems shall be supplied from the steering gear room. Means shall be provided in the steering gear room to disconnect remote steering gear control systems from the source of power.

(4) The shafting, piping, or electric cables of the two pilothouse steering control systems shall be run as widely separated as practicable throughout their length between the pilothouse and the steering gear room.

(c) Where only the main steering gear is power-driven, arrangements shall be such that either steering control system may be connected to control the main steering gear. Where both the main and auxiliary steering gears are power-driven, one steering control system shall control the main steering gear and the other shall control the auxiliary steering gear.

(d) For dual-power hydraulic type steering gears, of such a type that an auxiliary means of steering is not required, one control system shall control one hydraulic unit and the other control system shall control the other hydraulic unit.

§ 57.25–60 Arrangement of steering wheels.

(a) Steering wheels, including "trick wheels" which are used as the alternative steering means, shall turn in a clockwise direction for "right rudder" and counterclockwise for "left rudder." The ship's heading shall be to the right, following clockwise movement of the wheel.

(b) The arrangement of steering stations shall be such that the helmsman is abaft the wheel. However, if a wheel is fitted in the steering gear room, and is intended solely for warming up and testing the gear, the helmsman need not stand abaft the wheel. The rims of the wheels shall be plainly marked with arrows and lettering for right and for left rudder, or a suitable notice indicating these directions shall be posted directly in the helmsman's line of vision.

§ 57.25–65 Special steering apparatus.

(a) Where no regular rudder is fitted and steering action is obtained by a change of setting of the propelling unit, auxiliary steering is not required, nor will the requirements of this subpart be generally applicable. Special consideration will be given by the Commandant for such installations.

(b) When tiller bars instead of wheels are installed in the pilothouse, they shall be fore and aft when the rudders are amidships. A pointer shall be fitted to the forward end of the bar which shall point directly ahead when the rudders are amidships, and shall point to the right when the bow of the ship moves to the right, and shall point to the left when the bow of the ship moves to the left.

§ 57.25–70 Steering gear piping.

(a) The arrangement of piping for hydraulic steering gears shall be such that a change from the main to the auxiliary gear can be readily effected.

(b) A relief valve shall be provided for the protection of the hydraulic system.

(c) Pressure piping shall meet the requirements of Part 55 of this subchapter.

Subpart 57.30—Nuclear Energy

AUTHORITY NOTE: The provisions of this Subpart 57.30 also interpret or apply R.S. 4472, as amended, sec. 2, 23 Stat. 118, as amended, secs. 2, 633, 63 Stat. 496, 545; 46 U.S.C. 170, 2, 14 U.S.C. 2, 633. Treasury Department Order 167–17, June 29, 1955, 20 F.R. 4976.

§ 57.30–1 Scope.

(a) The requirements in this subpart apply to all installations, systems, and components thereof, utilizing nuclear energy for propulsion or for any other purpose, or handling radioactive materials other than as cargo.

(b) The regulations covering the transportation and handling of radioactive materials as cargo are contained in Part 146 of Subchapter N (Dangerous Cargoes) of this chapter.

§ 57.30–5 Definitions.

(a) The term "nuclear vessel" means any vessel in which power for propulsion, or for any other purpose, is derived from nuclear energy; or any vessel handling or processing substantial amounts of radioactive material other than as cargo.

(b) The term "nuclear energy" means all forms of energy released by nuclear fission or radioactive decay, or by any other form of nuclear transformation.

(c) The term "radioactive material" means any material or combination of materials that spontaneously emits ionizing radiation.

§ 57.30–10 General safety requirements.

(a) The reactor installation shall be designed to take into account the special conditions of service on board the vessel both in normal and exceptional circumstances of operation.

(b) Prior to the issuance of a certificate of inspection by the U.S. Coast Guard for a nuclear vessel, it shall be shown to the satisfaction of the Commandant that:

(1) The vessel provides a degree of safety for the non-nuclear portion at least equivalent to the relevant requirements prescribed in this chapter for a conventionally-powered ocean-going passenger vessel of similar size, capacity, and tonnage. In this respect components and systems such as watertight subdivision, stability, fire protection, bilge pumping arrangements, fire extinguishing arrangements, electrical installations, steering gear, astern power, and navigational aids will be evaluated in order to provide for the maximum practicable safety for the vessel.

(2) The vessel complies with such additional requirements as may be prescribed by the Commandant and with the requirements of the Atomic Energy Commission.

(3) The design, construction and operation of the vessel do not create an unreasonable radiation, or other hazard, at sea or in port, to the crew, passengers, or public or to the waterways or food or water supply.

(4) The nuclear systems or components thereof are provided with means for preventing the uncontrolled release of hazardous amounts of radioactive material to normally accessible spaces or to the ship's environment in the event of accident or malfunctioning of the nuclear system.

(5) The vessel has standby and emergency components essential to its safe operation in order to provide maximum protection in the event of an accident or malfuctioning of the nuclear system.

(c) A license or other certificate issued by the Atomic Energy Commission may be accepted by the Commandant as evidence that the vessel complies with the requirements of the Atomic Energy Commission and subparagraph (b) (3) and (4) of this section.

§ 57.30–15 Special operating procedures.

(a) In addition to the requirements specified in this chapter, all nuclear vessels may be subject to additional requirements governing fueling, start-up, and operation.

§ 57.30–20 Inspection, overhaul, and repairs.

(a) Every nuclear vessel subject to the regulations in this subchapter shall be inspected by the U.S. Coast Guard at least annually to ascertain that the hull, nuclear systems, machinery, equipment, appliances, etc., of the vessel comply with the regulations in this chapter.

(b) In addition to the requirements for inspection, test, overhaul and repair specified in this chapter, nuclear vessels may be subject to such additional requirements as may be prescribed by the Commandant for inspection, test, overhaul and repair.

§ 57.30–25 Radiation protection.

(a) The Standards for Protection Against Radiation set forth in 10 CFR Part 20 will be the radiation protection standards followed by the U.S. Coast Guard, except as otherwise provided for by law.

§ 57.30–30 Safety Assessment.

(a) A "Safety Assessment" shall be prepared to permit evaluation of the nuclear powerplant and safety of the vessel to ensure compliance with § 57.30–10(b)(3).

(b) The "Safety Assessment" shall be submitted to the Commandant for approval and shall always be kept up-to-date.

(c) The "Safety Assessment" will be used as a basis for establishing orderly negotiations between the United States and governments of countries which a nuclear vessel intends to visit to permit entry of nuclear ships into ports of different countries.

§ 57.30–35 Operating Manual.

(a) A fully detailed "Operating Manual" shall be prepared for the information and guidance of the operating personnel in their duties on all matters relating to the operation of the nuclear powerplant and having an important bearing on safety.

(b) The "Operating Manual" shall be submitted to the Commandant for approval and shall always be kept up-to-date.

(c) A copy of the "Operating Manual" shall be kept on board the vessel at all times.

PART 58—REPAIRS TO BOILERS, UNFIRED PRESSURE VESSELS AND APPURTENANCES

Subpart 58.01—General Requirements

Sec.
58.01–1 Scope.
58.01–5 Repairs, replacements, or alterations.

Subpart 58.05—Welding Repairs to New Pressure Vessels

58.05–1 Welding repairs when plate defects develop or are discovered during fabrication.

Subpart 58.10—Welding Repairs to Boilers and Unfired Pressure Vessels in Service

58.10–1 Scope.
58.10–5 Cracks.
58.10–10 Corroded surfaces.
58.10–15 Rivets and staybolts.
58.10–20 Patches in shells and tube sheets.
58.10–25 Stayed areas.
58.10–30 Seal welding.
58.10–35 Wrapper plates and back heads.

Subpart 58.15—Miscellaneous Boiler Repairs

58.15–1 Furnace repairs.
58.15–5 Stayed furnaces and combustion chambers.
58.15–10 Bagged or blistered shell plates.

Subpart 58.20—Welding Repairs to Castings

58.20–1 Welding repairs to defective carbon-steel castings.
58.20–5 Welding repairs to defective alloy-steel castings.

AUTHORITY: The provisions of this Part 58 issued under R.S. 4405, as amended, 4462, as amended; 46 U.S.C. 375, 416. Interpret or apply R.S. 4399, as amended, 4400, as amended, 4417, as amended, 4417a, as amended, 4418, as amended, 4421, as amended, 4426–4431, as amended, 4433, as amended, 4434, as amended, 4453, as amended, 4488, as amended, 4491, as amended, sec. 14, 29 Stat. 690, as amended, sec. 10, 35 Stat. 428, as amended, 41 Stat. 305, as amended, secs. 1, 2, 49 Stat. 1544, 1545, as amended, sec. 17, 54 Stat. 166, as amended, sec. 3, 54 Stat. 347, as amended, sec. 3, 70 Stat. 152, sec. 3, 68 Stat. 675; 46 U.S.C. 361, 362, 391, 391a, 392, 399, 404–409, 411, 412, 435, 481, 489, 366, 395, 363, 367, 526p, 1333, 390b, 50 U.S.C. 198; E.O. 11239, July 31, 1965, 30 F.R. 9671, 3 CFR, 1965 Supp. Treasury Department Orders 120, July 31, 1950, 15 F.R. 6521; 167–14, Nov. 26, 1954, 19 F.R. 8026; 167–20, June 18, 1956, 21 F.R. 4894; CGFR 56–28, July 24, 1956, 21 F.R. 5659; 167–38, Oct. 26, 1959, 24 F.R. 8857.

Subpart 58.01—General Requirements

§ 58.01–1 Scope.

The regulations in this part apply to the repairs of all boilers, unfired pressure vessels and appurtenances subject to inspection by the Coast Guard.

§ 58.01–5 Repairs, replacements, or alterations.

(a) No repairs, replacements or alterations, except emergency repairs, etc., shall be made to machinery boilers, unfired pressure vessels, their mountings or internal fittings, safety valves, piping systems, or pressure appliances without prior approval by the Officer in Charge, Marine Inspection.

(b) Emergency repairs, replacements, or alterations shall be reported as soon as practicable to the Officer in Charge, Marine Inspection, at or nearest the first port where the vessel may call after such repairs are made.

(c) Repairs, replacements, or alterations to installations in service shall so far as practicable be made with materials and in the manner specified for new construction.

Subpart 58.05—Welding Repairs to New Pressure Vessels

§ 58.05–1 Welding repairs when plate defects develop or are discovered during fabrication.

(a) *Cracked plates.* Plates which crack during cold forming operations as a result of localized stress raisers such as sharp plate edges, minor localized surface imperfections, and fractures which subsequent microstructure shows to be caused by coarse grain size may be repaired if authorized by the Commandant. Prior to such repairs being authorized, information shall be furnished as follows:

(1) Heat treatment to be employed prior to undertaking repairs.

(2) Method of excavating defective material and type of groove to be employed.

(3) Method of examining excavation to insure that all defective material has been removed.

(4) Welding procedure to be employed in effecting the repair.

(5) Heat treatment to be employed during and after welding.

(6) Type of nondestructive test to be made to insure that repair is satisfactory.

(b) *Laminations.* Laminations or inclusions in the plate which initially appear in the heat affected zone during welding operations or appear during the drilling of tube holes may be repaired if authorized by the Commandant. Prior to such repairs being authorized information shall be furnished as follows:

(1) Method of excavating defective material and type of welding groove to be used if any.

(2) Method of examining excavation to insure that all defective material has been removed.

(3) Welding procedure to be employed in effecting repair.

(4) Heat treatment to be employed during and after welding.

(5) Type of nondestructive test to be made to insure that repair is satisfactory.

Subpart 58.10—Welding Repairs to Boilers and Unfired Pressure Vessels in Service

§ 58.10–1 Scope.

(a) Repairs to boilers or unfired pressure vessels in service may be performed by welding provided the welding meets the applicable requirements of Part 56 of this subchapter. No repairs by welding shall be made, except temporary emergency repairs, without the prior approval of the Officer in Charge, Marine Inspection. Emergency repairs shall be replaced with permanent repairs meeting the requirements of this subchapter when the vessel returns to a port in which an Officer in Charge, Marine Inspection, is located, except in the case of minor repairs which in the opinion of the Officer in Charge, Marine Inspection, do not materially affect the safety of the boiler or pressure vessel.

(b) Repair welding of power boilers not meeting requirements for class I welded pressure vessels is prohibited unless the stress is carried by such other type(s) of construction complying with the requirements of this subchapter, and where the adequacy of the boiler design is not solely dependent upon the strength of the welds.

(c) Only welded repairs as specified in this subchapter are permitted on boilers and unfired pressure vessels. The welding repairs allowed by this subpart apply only to boilers and unfired pressure vessels fabricated of carbon steel. Welding repairs to boilers and unfired pressure vessels fabricated of alloy steel will be given special consideration by the Commandant. Such other method of repairs by means of welding not covered in this subchapter shall be referred to the Commandant and may be authorized by him if, in his opinion, it meets the intent of this subchapter.

§ 58.10–5 Cracks.

(a) Cracks extending from the calking edge of plates to the rivet holes of circumferential joints may be welded provided the cracks are veed out so that complete penetration of the weld metal is secured.

(b) Circumferential cracks from rivet hole to rivet hole in girth joints may be welded provided there are not more than three consecutive cracked ligaments nor more than a total of six cracked ligaments in any one girth joint.

(c) Cracks in staybolted plates may be welded provided they are located entirely within staybolted areas and the total length of any crack or series of consecutive cracks does not exceed two staybolt pitches.

(d) Cracks in plain, circular or Adamson ring or similar type furnaces may be welded provided any one crack does not exceed 12 inches in length and after completion the weld is stress-relieved as required by § 56.01–70 of this subchapter. Cracks in corrugated furnaces may be repaired by welding provided any one crack does not exceed 20 inches in length.

(e) Fire cracks may be welded at riveted door openings extending from

the edge of the plate, but not more than 2 inches beyond the centerline of the rivet holes.

(f) Cracks may be welded between tube holes in the shell of water-tube boiler drums, provided there are not more than two cracks in any one row in any direction, nor more than a total of four cracks in a drum, and further provided the welding meets the requirements of this subchapter for class I welded pressure vessels and is approved by the Commandant.

(g) All cracks permitted to be repaired under this subpart shall be excavated to sound metal by grinding, flame gouging or chipping out the defective metal to form a clean welding groove. The first two methods of excavation are preferable. Either a V groove or U groove wherein complete penetration of the weld metal is secured may be used. After excavation is completed and prior to welding, the excavated area shall be examined by magnetic particle testing to insure that the entire crack was excavated. When the reverse side of the weld is accessible the root of the weld shall be chipped or ground out to insure a clean surface of the originally deposited metal and the resultant groove welded to obtain a sound weld having complete penetration. During welding a preheat of 200 degrees plus or minus 50 degrees F. shall be maintained by controlled temperature. For thicknesses exceeding ¾ inch, suitable U grooves should be employed. A welding sequence shall be used so as to equalize welding stresses.

(h) After cracks originating in tube or rivet holes are repaired by welding, the holes shall be properly reamed and the weld reinforcing ground flush with the plate in way of rivet heads.

(i) Flat tube sheets in fire-tube boilers which have corroded or where cracks exist in the ligaments may be repaired by welding.

(j) The welding repairs to drums of power boilers, except as otherwise permitted in this subpart, is prohibited.

§ 58.10–10 Corroded surfaces.

(a) Corroded surfaces in the calking edges of circumferential seams may be built up by welding to the original thickness under the following conditions:

(1) The thickness of the original metal to be built up between rivet holes and calking edge shall not be less than one-fourth of the diameter of the rivet hole, and the portion of the calking edge to be thus reinforced shall not exceed 30 inches in length in a circumferential direction.

(2) In all repairs to circumferential seams by welding, the rivets shall be removed over the portions to be welded for a distance of at least 6 inches beyond the repaired portion.

(3) After repairs are made the rivet holes shall be reamed before the rivets are re-driven.

(b) It is not permissible to build up or reinforce a grooved or corroded area of unstayed internal surfaces by means of welding, except that widely scattered pit holes may be built up by welding.

(c) Where external corrosion has reduced the thickness of flat plates around hand holes to an extent of not more than 40 percent of the original thickness and for a distance not exceeding 2 inches from the edge of the hole, the plate may be built up by welding.

(d) Where stayed sheets have corroded to a depth not exceeding 40 percent of their original thickness, they may be reinforced or built up by welding. Where the staybolts are fitted with riveted heads, the staybolts in the reinforced area shall be renewed in accordance with the provisions of Subparts 52.30 and 52.35 of this subchapter, but where the staybolts are fitted with nuts, the nuts may be removed and after reinforcing has been applied, collars may be welded around the staybolts in lieu of the nuts. Such reinforced areas shall not exceed 400 square inches nor more than 30 inches in one direction. Two such areas in any one plate may be reinforced: *Provided*, That the distance between the reinforced surfaces is not less than 30 inches.

(e) When the corroded portion of a staybolted surface exceeds 400 square inches, it is permissible to repair the same by cutting out the defective portion and replacing it with a new plate, the edges of the new plate to be welded in position. In such cases, new staybolts shall be fitted in accordance with the requirements of Subparts 52.30 and 52.35 of this subchapter and where welding is performed through a line of staybolts, welded collars as required by Figure 52.35–1 of this subchapter shall be used to attach the staybolts.

§ 58.10–15 Rivets and staybolts.

(a) It is not permitted to reinforce or build up by welding the heads of rivets or staybolts that have deteriorated. Such rivets or staybolts shall be replaced. The seal welding of rivet heads to secure tightness is prohibited.

(b) Where leaks develop around staybolts which are otherwise in good condition, the nuts may be replaced with a beveled collar formed around the end of the stay by means of welding. In such cases, the depth of collar measured on the stay and the width measured on the plate, shall be equal to one-half the diameter of the staybolt. (See Figure 52.35–1 of this subchapter.)

§ 58.10–20 Patches in shells and tube sheets.

(a) Unreinforced openings in the shells or drums of boilers or pressure vessels, the diameter of which does not exceed the maximum diameter of an unreinforced opening, in accordance with § 52.25–15 of this subchapter, may be closed by the use of a patch or plate inside the drum or shell and sealed against leakage by welding. Such plates shall have a diameter of at least 2 inches larger than the diameter of the hole and shall have a thickness equal to the thickness of the plate to which it is attached. It is not permissible to insert such patches in the shell or head flush with the surrounding plate unless the requirements of this subchapter for Class I welded pressure vessels are met.

(b) Portions of tube sheets which have deteriorated may be renewed by replacing the wasted portion with a new section. The ligaments between the tube holes may be joined by means of welding and staytubes, or other acceptable means of lowering the stress on the repaired section may be installed if in the judgment of the Officer in Charge, Marine Inspection, it is necessary.

(c) The edge preparation and preheat of butt-welded joints employed in the renewal of defective or corroded boiler plates shall comply with the requirements of § 58.10–5 (g).

§ 58.10–25 Stayed areas.

Welding repairs are permitted in staybolted areas or areas adequately stayed by other means so that should failure of the welds occur the stress will be carried by the stays. The welds shall be located entirely within staybolted areas which prohibit welds passing through the outer row of stays.

§ 58.10–30 Seal welding.

Where leaks occur in riveted joints or connections, they shall be carefully investigated to determine the cause. Such leaks may be made tight by seal welding the edge, if, in the opinion of the Officer in Charge, Marine Inspection, this will make a satisfactory repair.

§ 58.10–35 Wrapper plates and back heads.

Wrapper plates and back heads may be renewed in whole or repaired as follows:

(a) Wrapper plates or back heads shall be cut between two rows of staybolts or on a line of staybolts where the thickness is approximately the same as the original construction. If welding is employed on a line of staybolts, the staybolts shall be fitted with a welded collar as required in Figure 52.35–1 of this subchapter.

(b) The edges of wrapper plates riveted to tube sheets and back heads shall be removed by cutting out the rivets.

(c) The edges of existing plates and new plates shall be beveled by chipping, flame cutting, or grinding so as to form a suitable groove whereby complete penetration of the weld metal will be obtained. The edge preparation and preheat shall comply with the requirements of § 58.10–5 (g).

(d) The edges of the new plate shall be butt-welded and the plate shall be riveted to the flanges of the tube sheet and back heads and the staybolts renewed.

(e) Sections of wrapper plates of combustion chambers outside of stayed areas may be repaired by welding provided the welded joints are stress-relieved by means of controlled heat and the joints are nondestructively tested.

Subpart 58.15—Miscellaneous Boiler Repairs

§ 58.15–1 Furnace repairs.

(a) Where corrugated or plain furnaces or flues are distorted 1½ inches or

more, they shall be repaired by either of the following methods:

(1) The furnace shall be forced back to a true circular shape, and the Officer in Charge, Marine Inspection, may require strong-backs or other acceptable means of support to hold the furnace from future collapse, if in his opinion such support is necessary; or,

(2) The furnace shall be adequately stayed as found necessary in the judgment of the Officer in Charge, Marine Inspection.

(b) Distortion means the difference between any single measured diameter of the furnace and the diameter of a true circle at the same location. The diameter of the true circle may be taken as the original furnace diameter or may be determined by a means acceptable to the Officer in Charge, Marine Inspection.

(c) Where the distortion does not exceed 1½ inches it will not be necessary to force the furnace back to a true circle if the allowable pressure is reduced in the ratio of 1½ percent for each 1/10 of an inch of distortion. However, if the maximum distortion does not exceed one inch and the length of the distorted area is not more than three corrugations, or if the maximum distortion does not exceed ¾ inch for a length greater than three corrugations of distorted area, the repairs or reduction in pressure will not be required unless considered necessary by the marine inspector.

(d) When it becomes necessary to rivet a patch to a furnace or other part of the heating surface, the riveted patch shall be placed on the water side of the plate in order not to form a pocket in which sediment may collect.

(e) Furnace crowns which have become distorted, not in excess of the limitations provided in paragraph (c) of this section, may be repaired by pumping back the distorted section to as nearly a true circle as possible and reinforcing the same by means of a ring, arc- or gas-welded to the distorted corrugation as shown in Figure 58.15-1 (e), the welding to be done by qualified welders using acceptable welding electrodes in accordance with § 56.01-20 of this subchapter.

§ 58.15-5 Stayed furnaces and combustion chambers.

(a) Where the plate forming the walls of stayed furnaces or combustion chambers becomes bulged between staybolts, repairs may be made by inserting an additional staybolt in the center of such space supported by the four staybolts.

(b) Where it is desired to rivet a patch to the wall of a stayed furnace or combustion chamber, the defective portion of the plate shall be cut away until solid material is reached, the patch shall be riveted on the water side, and the staybolts renewed, and extended through the new plate.

§ 58.15-10 Bagged or blistered shell plates.

(a) When the shell plates of cylindrical boilers which are exposed to the radiant heat of the fire become bagged or blistered, it shall be the duty of the chief engineer in charge of the vessel to notify the Officer in Charge, Marine Inspection, for examination before raising steam on the boiler.

(b) Where the shell plate is bagged due to overheating, the Officer in Charge, Marine Inspection, may, if in his judgment it is practicable, permit the same to be driven back to its original position.

(c) Where the shell plate has blistered, bagged, or bulged to such an extent that there is an appreciable thinning of the plate, the Officer in Charge, Marine Inspection, shall require the defective portion to be cut away and the shell repaired by fitting a patch of steel plate conforming to the requirements of Subpart 51.04 of this subchapter in place of the defective portion, care being taken that the riveting schedule of the patch is so arranged as to give the plate sufficient strength to withstand the stress placed on it in service.

Subpart 58.20—Welding Repairs to Castings

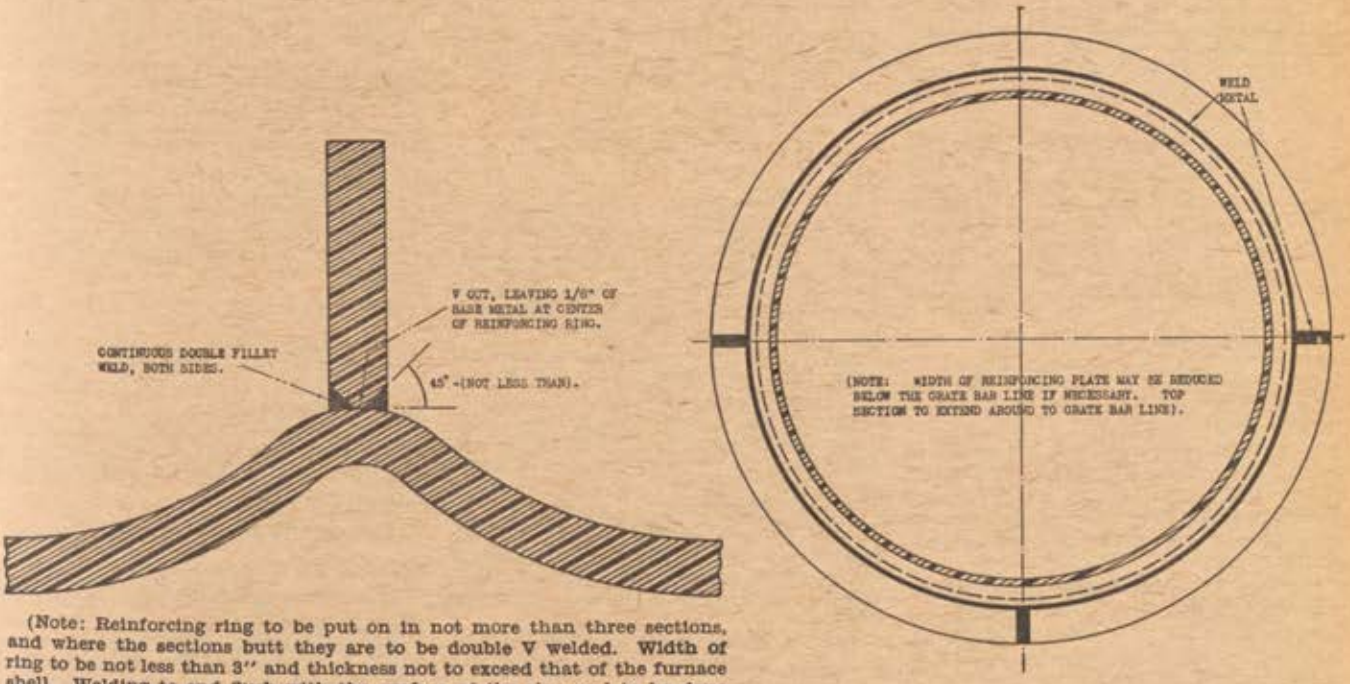
§ 58.20-1 Welding repairs to defective carbon-steel castings.

(a) Defects in carbon-steel castings, such as valve bodies, pipe fittings, channels, covers, manifolds, and other pressure-containing appliances, may be repaired by arc or gas welding.

(b) Defects in carbon-steel castings shall be classed as follows:

(1) *Minor defects.* Minor defects are undersized defective areas resulting from oxyacetylene cutting, grinding, or chipping during cleaning operation, surface sand or slag defects or other slight surface defects except cracks or cold shuts. The excavated depth of a minor defect shall not exceed 20 percent of the wall thickness or 1 inch, whichever is the lesser. No lineal dimension shall exceed four times the wall thickness or be greater than 6 inches, whichever is the lesser.

(2) *Major defects.* All defects exceeding the depth or size given in subparagraph (1) of this paragraph shall be considered a major defect, which shall



(Note: Reinforcing ring to be put on in not more than three sections, and where the sections butt they are to be double V welded. Width of ring to be not less than 3" and thickness not to exceed that of the furnace shell. Welding to end flush with the surface of the ring and to be done by a welding operator duly qualified.)

FIGURE 58.15-1 (e)—Approved method of reinforcing furnace crowns by means of arc or gas welding.

be repaired in the same manner as a minor defect. Repairs of major defects shall be nondestructively tested as required by paragraph (h) of this section.

(e) Prior to any welding being done, all defective material shall be removed until the base metal is shown to be sound. Defective areas of castings may be removed by chipping, grinding, drilling, or oxyacetylene grooving to a sufficient depth to insure that the remaining base metal is shown to be sound by acid etching, radiography, or magnetic particle testing. The latter methods of testing are preferred. Any slag remaining after oxyacetylene grooving shall be completely removed by chipping or grinding. When defects are removed by drilling, the resulting hole shall be countersunk to a depth of at least 25 percent of the metal thickness with a bevel of the included angle being not less than 45 degrees.

(d) Prior to any welding being done, the cavity and the adjoining area shall be preheated to a temperature suitable for the chemical elements and thickness of metal involved which experience indicates is satisfactory. Castings shall be preheated to a temperature which experience indicates is suitable for the chemical elements and thickness of the casting when lugs, supports, ribs, or bosses are to be welded thereto.

(e) Castings other than those which have been repaired for minor surface defects, the excavated dimensions of which do not exceed the limitations specified by subparagraph (b) (1) of this section, shall be stress-relieved in a furnace to a temperature of from 1,100° F. to 1,200° F. for 1 hour per inch of maximum thickness and allowed to cool in the furnace to 500° F. before removal.

(f) Filler metal used in the repair of defective steel castings shall be acceptable electrodes in accordance with § 56.01–20 of this subchapter and shall meet the chemical and physical properties of the base metal.

(g) The defective material removed shall be replaced using pipe welders qualified in accordance with Qualification Test No. 4 for the position in which the welding is to be done as given in § 56.01–10 of this subchapter. The use of welders qualified to weld plate shall be permitted provided the welding is done in the flat position.

(h) Completed welds shall be inspected for cracks and other defects by magnetic particle testing, and in the case of major repairs, the welded area shall be examined by radiography if the casting is to be used in steam lines subject to boiler pressure, boiler feed, or blowoff lines. Prior to the use of magnetic particle inspection, the welds shall be made smooth and free of grooves or depressions.

(i) After repair of defective castings has been completed a hydrostatic test as prescribed in § 61.30–5 of this subchapter based upon the primary service pressure rating shall be applied.

§ 58.20–5 Welding repairs to defective alloy-steel castings.

Defects in alloy-steel castings may be repaired by arc or gas welding in accordance with the requirements of § 58.20–1, provided the preheat and postheat employed are satisfactory for the material to be welded and process approval tests are conducted. The heat treatment and process approval tests shall be acceptable to the Commandant.

PART 59—INDEPENDENT INTERNAL COMBUSTION ENGINE FUEL TANKS

Subpart 59.01—General Requirements

Sec.
59.01–1 Scope.

Subpart 59.05—Gasoline Fuel Tanks

59.05–1 Construction.
59.05–5 Installation.
59.05–10 Tests.

Subpart 59.10—Diesel Fuel Tanks

59.10–1 Construction.
59.10–5 Installation.
59.10–10 Tests.

AUTHORITY: The provisions of this Part 59 issued under R.S. 4405, as amended, 4462, as amended; 46 U.S.C. 375, 416. Interpret or apply R.S. 4399, as amended, 4400, as amended, 4417, as amended, 4417a, as amended, 4418, as amended, 4421, as amended, 4426–4431, as amended, 4433, as amended, 4434, as amended, 4453, as amended, 4488, as amended, 4491, as amended, sec. 14, 29 Stat. 690, as amended, sec. 10, 35 Stat. 428, as amended, 41 Stat. 305, as amended, secs. 1, 2, 49 Stat. 1544, 1545, as amended, sec. 17, 54 Stat. 166, as amended, sec. 3, 54 Stat. 347, as amended, sec. 3, 70 Stat. 152, sec. 3, 68 Stat. 675; 46 U.S.C. 361, 362, 391, 391a, 392, 399, 404–409, 411, 412, 435, 481, 489, 366, 395, 363, 367, 526p, 1333, 390b, 50 U.S.C. 198; E.O. 11239, July 31, 1965, 30 F.R. 9671, 3 CFR, 1965 Supp. Treasury Department Orders 120, July 31, 1950, 15 F.R. 6521; 167–14, Nov. 26, 1954, 19 F.R. 8026; 167–20, June 18, 1956, 21 F.R. 4894; CGFR 56–28, July 24, 1956, 21 F.R. 5659; 167–38, Oct. 26, 1959, 24 F.R. 8857.

Subpart 59.01—General Requirements

§ 59.01–1 Scope.

(a) The regulations in this part contain requirements for independent internal combustion engine fuel tanks, on all vessels subject to inspection by the Coast Guard and on all motorboats and motor vessels of more than 15 gross tons carrying passengers for hire.

(b) Passenger vessels exceeding 100 gross tons constructed prior to July 1, 1935, may carry gasoline as fuel not exceeding 40 gallons to supply the emergency electrical system. Passenger vessels exceeding 100 gross tons constructed on or after July 1, 1935, and all emergency systems converted on or after July 1, 1935, shall use diesel fuel for internal combustion engine units. Such vessels may carry a sufficient quantity of diesel fuel to supply the emergency electrical system.

(c) An outage of 2 percent shall be provided on all fuel tanks containing petroleum products.

Subpart 59.05—Gasoline Fuel Tanks

§ 59.05–1 Construction.

(a) Tanks may be of either cylindrical or rectangular form, except that tanks for emergency electrical systems shall be of cylindrical form.

(b) Tanks shall be designed to withstand the maximum head to which they may be subjected in service, except that in no case shall the thickness of the shell or head be less than ⅛ inch.

(c) Tanks shall be constructed of wrought iron, steel or nonferrous material, or corrosion-resistant alloys suitable for the purpose. Tanks constructed of noncorrosion resistant materials less than 3/16 inch in thickness shall be galvanized by the hot-dipped process both inside and outside.

(d) Joints shall be riveted, brazed or welded, except that soldered joints may be used on small tanks of 20 gallons or less capacity, provided the solder used has a melting point of not less than 800° F.

(e) All nozzle connections shall be made to the top of the tank and shall be securely riveted, welded, brazed or soldered to the tank.

(f) No tubular gauge glasses or trycocks shall be fitted to the tanks.

(g) Tanks shall be provided with swash plates and braces, where necessary. The material used shall be the same as the tank.

§ 59.05–5 Installation.

(a) Gasoline fuel tanks used for propulsion shall be located in watertight compartments separate from, but adjacent to the engineroom or machinery space. Fuel tanks for auxiliaries shall be located on or above the weather deck outside of the engine housing or compartment and as close to the engine as practicable. All tanks shall be so installed as to provide a free circulation of air around the tanks.

(b) Cylindrical tanks with longitudinal seams shall be arranged horizontally where practicable so that such seams are located as near the top as possible.

(c) All tanks shall be securely fastened and shall be arranged as to be readily inspected or movable for inspection. Portable fuel tanks are not permitted.

§ 59.05–10 Tests.

(a) Tanks vented to atmosphere shall be hydrostatically tested to a pressure of at least 10 pounds per square inch gage after installation.

(b) All tanks not vented to atmosphere shall be constructed and tested in accordance with Parts 54 and 61 of this subchapter.

Subpart 59.10—Diesel Fuel Tanks

§ 59.10–1 Construction.

(a) Tanks may be of either cylindrical or rectangular form.

(b) Tanks shall be designed to withstand the maximum head to which they may be subjected in service, except that

in no case shall the thickness of tanks having capacities of 40 gallons or less be less than 1/16 inch, and tanks having capacities over 40 gallons be less than 1/8 inch.

(c) Joints shall be riveted, brazed, or welded, except that soldered joints may be used on small tanks of 20 gallons or less capacity provided that the solder used has a melting point of not less than 800° F.

(d) Tanks shall be provided with swash plates and braces where necessary. The material used shall be the same as the tank.

(e) All nozzles for pipe connections shall be securely riveted, welded, brazed or soldered to the tank. Where liquid level indicating devices are attached to the tank, they shall be of heat resistant materials adequately protected from mechanical damage and provided at the tank connections with devices which will automatically close in the event of rupture of the gage or gage lines.

§ 59.10–5 Installation.

(a) Tanks containing fuel for emergency lighting units shall be located on an open deck or in an adequately ventilated metal compartment. No tank shall be located in a compartment where the temperature may exceed 150° F.

(b) When cylindrical tanks are installed, longitudinal seams shall be located as near the top of the tank as possible.

(c) The tanks shall be properly secured and accessible for inspection.

§ 59.10–10 Tests.

(a) Tanks vented to atmosphere shall be tested to a hydrostatic pressure of 5 pounds per square inch gage after installation, and at least to the maximum height the liquid may rise in the vent, whichever is greater.

(b) All tanks not vented to atmosphere shall be constructed and tested in accordance with Parts 54 and 61 of this subchapter.

PART 61—INSTALLATIONS, TESTS, INSPECTIONS, MARKINGS, AND OFFICIAL FORMS

Subpart 61.01—General Requirements

Sec.
61.01–1 Scope.

Subpart 61.05—Installations

61.05–1 Scope.
61.05–5 Foundations.
61.05–10 Protection of adjacent structure.
61.05–15 Boiler uptakes.
61.05–20 Machinery guards.
61.05–25 Means of stopping machinery.

Subpart 61.10—Initial and Periodic Vessel Inspection

61.10–1 Scope.
61.10–5 Requirements for steam-propelled motorboats.

Subpart 61.15—Tests and Inspections of Machinery and Equipment

61.15–5 Tests and inspections of steering gear.
61.15–10 Trial-trip observance.
61.15–15 Tail shaft survey.
61.15–16 Drydock examination.

Subpart 61.20—Tests and Inspection of Boilers

Sec.
61.20–1 Boilers under construction.
61.20–5 Preparation of boilers for inspection and test.
61.20–10 New boilers.
61.20–15 Boilers in service.
61.20–20 Boiler mountings and attachments.
61.20–25 Boilers of foreign-built vessels admitted to American registry.

Subpart 61.25—Tests and Inspections of Pressure Vessels

61.25–1 Scope.
61.25–3 Welded pressure vessels under construction.
61.25–5 New pressure vessels.
61.25–10 Hydrostatic test of riveted pressure vessels.
61.25–15 Hydrostatic test of welded and brazed pressure vessels.
61.25–16 Pneumatic testing of pressure vessels.
61.25–20 Pressure vessels in service.

Subpart 61.30—Tests and Inspection of Piping, Valves and Fittings

61.30–1 Scope.
61.30–5 Shop test.
61.30–10 Installation test.
61.30–15 Piping in service.
61.30–20 Sea chests, sea valves and strainers.

Subpart 61.35—Proof Hydrostatic Tests

61.35–1 Hydrostatic tests of boilers and appurtenances to determine pressure rating.
61.35–5 Proportional limit method.

Subpart 61.40—Markings

61.40–1 Boilers.
61.40–5 Unfired pressure vessels.

Subpart 61.45—Official Forms

61.45–1 Scope.
61.45–5 Form CG–2935; boiler data report; manufacturer's certification.
61.45–10 Form CG–2936; unfired pressure vessel data report; manufacturer's certification.
61.45–15 Form CG–935A; affidavit of manufacturer of class B material or appliances.

AUTHORITY: The provisions of this Part 61 issued under R.S. 4405, as amended, 4462, as amended; 46 U.S.C. 375, 416. Interpret or apply R.S. 4399, as amended, 4400, as amended, 4417, as amended, 4417a, as amended, 4418, as amended, 4421, as amended, 4426–4431, as amended, 4433, as amended, 4434, as amended, 4453, as amended, 4488, as amended, 4491, as amended, sec. 14, 29 Stat. 690, as amended, sec. 10, 35 Stat. 428, as amended, 41 Stat. 305, as amended, secs. 1, 2, 49 Stat. 1544, 1545, as amended, sec. 17, 54 Stat. 166, as amended, sec. 3, 54 Stat. 347, as amended, sec. 3, 70 Stat. 152, sec. 3, 68 Stat. 675; 46 U.S.C. 361, 362, 391, 391a, 392, 399, 404–409, 411, 412, 435, 481, 489, 366, 395, 363, 367, 526p, 1333, 390b, 50 U.S.C. 198; E.O. 11239, July 31, 1965, 30 F.R. 9671, 3 CFR, 1965 Supp. Treasury Department Orders 120, July 31, 1950, 15 F.R. 6521; 167–14, Nov. 26, 1954, 19 F.R. 8026; 167–20, June 18, 1956, 21 F.R. 4894; CGFR 56–28, July 24, 1956, 21 F.R. 5659; 167–38, Oct. 26, 1959, 24 F.R. 8857.

Subpart 61.01—General Requirements

§ 61.01–1 Scope.

The regulations in this part apply to the installations, tests, inspections, and markings of all boilers, pressure vessels and machinery subject to inspection by the Coast Guard.

Subpart 61.05—Installations

§ 61.05–1 Scope.

The regulations in this subpart apply to the installations of machinery and pressure vessels installed on vessels subject to inspection by the Coast Guard.

§ 61.05–5 Foundations.

(a) Drawings showing details of proposed foundations, or saddles, for boilers and the proposed means of bracing boilers in the vessel shall be submitted for approval to the Officer in Charge, Marine Inspection, in the district where the installation is being made.

(b) Provision shall be made in foundations for expansion of the boilers when heated.

(c) Boilers shall be provided with chocks to prevent movement in the event of collision unless a bolted or riveted construction satisfactorily provides for this contingency.

§ 61.05–10 Protection of adjacent structure.

(a) Boilers shall be so placed that all parts may be readily accessible for inspection and repair.

(b) In vessels having a double bottom or other extensive surfaces directly below the boiler, as in the case of keels and girders in wooden vessels, the distance between such surface and a boiler shall in no case be less than 8 inches at the lowest part of a cylindrical boiler and not less than 18 inches under the pans of water-tube boilers.

(c) In certain types of vessels where the boiler foundation forms the ash pit, such foundations shall be efficiently ventilated, except in cases where the ash pit is partially filled with water at all times.

(d) The pans of oil-burning, water-tube boilers shall be arranged to prevent oil from leaking into the bilges and shall be lined with firebrick or other heat resisting material.

(e) In vessels constructed of wood or having wood structure adjacent to boilers or uptakes such structure shall be protected by noncombustible, nonconducting material covered with sheet metal, and the distance between the wooden structure and the uptakes and funnels shall in no case be less than 12 inches.

(f) The distance between a boiler and a compartment containing fuel oil shall not be less than 24 inches at the back end of a boiler and 18 inches elsewhere, except that for a cylindrical part of a boiler or a knuckle in the casing of a water-tube boiler, these distances may be reduced to 18 and 12 inches, respectively, provided the requirements of paragraph (a) are complied with.

(g) All oil-burning boilers shall be provided with oiltight drip pans under the burners and elsewhere where necessary to prevent oil draining into the bilges.

§ 61.05–15 Boiler uptakes.

(a) Where dampers are installed in the uptakes or funnels, the arrangement shall be such that it will not be possible

to shut off the gas passages from the operating boilers.

(b) All main and auxiliary boilers shall be fitted with separate gas passages from each boiler.

§ 61.05–20 Machinery guards.

Gears, couplings, flywheels, and all machinery capable of injuring personnel shall be provided with adequate covers or guards.

§ 61.05–25 Means of stopping machinery.

(a) Machinery driving forced and induced draft fans, fuel oil transfer pumps, fuel oil unit pumps and other similar fuel pumps shall be fitted with remote controls from a readily accessible position outside of the space concerned so that they may be stopped in the event of fire occurring in the compartment in which they are located. These controls shall be suitably protected against accidental operation or tampering.

Subpart 61.10—Initial and Periodic Vessel Inspection

§ 61.10–1 Scope.

(a) Initial and periodic inspection and tests shall be made of the main and auxiliary machinery, boilers and equipment as prescribed in this part. The inspections and tests shall be such as to insure that the main and auxiliary machinery, boilers and their appurtenances, and equipment are in satisfactory operating condition and fit for the service for which they are intended.

§ 61.10–5 Requirements for steam-propelled motorboats.

(a) The requirements covering design of the propelling engine, boiler, and the auxiliary machinery, and the inspection thereof on all motorboats which are more than 40 feet in length and which are propelled by machinery driven by steam shall be in accordance with the applicable provisions of this subchapter.

(b) If the engines, boilers, and auxiliary machinery are found to be in safe operating condition at the initial or annual inspection, the Officer in Charge, Marine Inspection, shall issue a letter to that effect, and such letter shall be posted on the vessel under glass.

Subpart 61.15—Tests and Inspections of Machinery and Equipment

§ 61.15–5 Tests and inspections of steering gear.

(a) Steering gear shall be tested and inspected by the inspector at the regular annual or biennial inspection and oftener if necessary.

(b) All devices employed in the change-over from automatic to manual operation shall be examined and tested.

§ 61.15–10 Trial-trip observance.

The operation of main and auxiliary engines, boilers, steering gear and auxiliaries shall be observed on the trial trip of each new vessel and all deficiencies which affect the safety of the vessel shall be corrected to the satisfaction of the Officer in Charge, Marine Inspection.

§ 61.15–15 Tail shaft survey.

(a) The requirements in this section apply only to ocean and coastwise vessels.

(b) Every vessel having the tail shaft fitted with a continuous liner or having shafts of material resistive to corrosive attack of sea water, or where pressure lubrication is used, shall have the tail shaft drawn at least once in every three years; in all other cases the shaft shall be drawn at least once in every two years, or whenever deemed necessary by the Officer in Charge, Marine Inspection. However, if the circumstances warrant it, the Coast Guard District Commander may extend this time to the next regular drydocking period, but not to exceed four months: *Provided*, That when it is shown that a vessel has had a long period of layup, the Coast Guard District Commander may grant an extension equal to the time the vessel has been out of commission, but in no case shall the extension exceed one year.

(c) Where the propelling machinery is located amidships the after bearing shall be rebushed when it is worn down to ¼ inch clearance for shafts of 9 inches or less in diameter, 5/16 inch clearance for shafts exceeding 9 inches but not exceeding 12 inches in diameter and ⅜ inch clearance for shafts exceeding 12 inches diameter. Where the propelling machinery is located aft the maximum clearance shall be one grade (1/16 inch) less than the above clearance.

§ 61.15–16 Drydock examination.

When any vessel is drydocked, examination shall be made of the propeller, stern bushing, sea connections, and fastenings if deemed necessary by the inspector.

Subpart 61.20—Tests and Inspection of Boilers

§ 61.20–1 Boilers under construction.

(a) When one or more boilers are under construction, manufacturers shall allow inspectors access to such boilers at such times as the inspectors shall deem necessary in order to determine by actual measurements that the boilers are being constructed in all respects in accordance with the approved design, and that the workmanship is good.

(b) Where boilers or pressure vessels are constructed in one inspection zone for installation on a vessel in another inspection zone, the Officer in Charge, Marine Inspection, in the former inspection zone shall, upon request of the Officer in Charge, Marine Inspection, in the latter inspection zone examine and report on such boilers or pressure vessels and ascertain that the proper materials are being used, and that the workmanship is good.

(c) For inspection of welded pressure vessels under construction, see § 61.25–3.

§ 61.20–5 Preparation of boilers for inspection and test.

(a) It shall be the responsibility of the chief engineer to prepare the boilers for inspection. For internal inspection, manhole, and handhole plates, and washout plugs shall be removed as required by the inspector and the furnace and combustion chambers thoroughly cooled and cleaned. Portable obstructions shall be removed as necessary for proper access. In preparing the boilers for the hydrostatic test, they shall be filled with water at not less than 70° F. and not more than 160° F. for water-tube boilers and not more than 100° F. for fire-tube boilers. The safety valves shall be secured by means of gags or clamps.

§ 61.20–10 New boilers.

(a) Each new boiler shall be hydrostatically tested after installation to 1½ times the maximum allowable pressure before the boilers are covered. All accessible parts of the boiler shall be examined while under test. After the test, the boiler shall be emptied, opened up and all interior surfaces shall be examined to ascertain that no defects have occurred due to the hydrostatic test.

(b) In addition to the hydrostatic tests prescribed in this section, automatically controlled packaged auxiliary boilers shall be subjected to the performance test specified in Subpart 162.026, Subchapter Q (Specifications) of this chapter.

(c) Upon completion of the hydrostatic test and the boiler examination prescribed in paragraph (a) of this section, and after the installation of the brick work and lagging, those boilers that are to be operated at a pressure equal to or in excess of 400 pounds per square inch gage, or at a steam temperature equal to or in excess of 700° F., may, at the request of the owner or builder, be given an additional test under steam in accordance with the following:

(1) The steam pressure applied to the boilers and to the main and auxiliary steam piping shall not exceed 1¼ times the maximum allowable pressure. Sufficient steam is to be bled from the superheater outlet, either by operating auxiliary machinery, or discharging to the atmosphere, so that service temperatures will not be exceeded. For this test the regular safety valve springs should be replaced by springs designed to operate at the test pressure. After the conclusion of this test the test springs are to be replaced with springs designed to operate at the maximum allowable pressure.

(2) An examination shall be made of all parts of the system during the test to determine there is no evidence of weakness.

§ 61.20–15 Boilers in service.

(a) Power boilers, superheaters, economizers, and low-pressure heating boilers shall be examined by an inspector at the regular annual or biennial inspection, and oftener if necessary, to determine that the complete unit is in a safe and satisfactory condition. Where hydrostatic tests are required, an inspection shall be made of all accessible parts while under pressure.

(b) Hydrostatic tests shall be applied to all boilers as provided in Table 61.20–15 (b). The owner, master, or person in charge of the vessel shall give an advance notice to the appropriate Officer

in Charge, Marine Inspection, in order that an inspector will be assigned to witness the test and make the required inspection.

TABLE 61.20-15 (b)—HYDROSTATIC TESTS

Boiler	Passenger vessels	Cargo, tank and miscellaneous vessels
Fire tube	Annual	Annual.
Water tube	do	Quadrennial.

(c) Fire tube boilers which cannot be entered or which cannot be satisfactorily examined internally, all boilers of lap seam construction and all boilers to which extensive repairs have been made or the strength of which the inspector has any reason to question, shall be subjected to a hydrostatic test of 1½ times the maximum allowable pressure. All other boilers shall be subjected to a hydrostatic test of 1¼ times the maximum allowable pressure.

(d) In applying hydrostatic pressure to boilers, arrangements shall be made to prevent main and auxiliary stop valves from being subjected at the same time to the hydrostatic pressure on one side and steam pressure on the other side.

(e) If the inspector has reason to believe that the boiler has deteriorated any appreciable extent under the bottom where it rests on saddles or foundations, he shall cause the boiler to be lifted to such position that it can be thoroughly examined, provided the examination cannot be made otherwise.

(f) The marine inspector may require any boiler to be drilled or gaged to determine the actual thickness at any time if doubt exists as to its safety. At the first inspection for certification after a Scotch, Western River, or other fire tube or flue boiler has been installed for ten years, and at such other times as the inspector shall deem necessary, such boilers shall be drilled or gaged at or near the waterline and bottom, and at such other places as the inspector considers necessary, for the purpose of gaging the shell to determine the extent of deterioration. Alternatively, a method of nondestructive examination such as the use of ultrasonic or other acceptable means may be used. Prior to the use of nondestructive methods of examination by the above procedure, it shall be demonstrated by the user, in the presence of a marine inspector on specimens similar to those to be examined, that consistent results having an accuracy of plus or minus 4 percent of the measurements secured by micrometers, are obtainable. If the thickness found by actual measurement is less than the original thickness, the maximum allowable pressure shall be recalculated using the thinnest portion of the shell or head material as the minimum thickness to be used in the calculations, and the maximum allowable pressure thus determined shall not exceed the pressure permitted by the application of the boiler design formulas. For the purpose of such recalculations, the design formulas specified in this subchapter in effect at the time the boilers were originally contracted for or built shall be used. The design formulas specified in Subchapter G (Marine Engineering Installations Contracted for Prior to July 1, 1935) of this chapter may be used for boilers made or contracted for prior to July 1, 1935, or alternatively, the design formulas given in this subchapter may be used.

§ 61.20-20 Boiler mountings and attachments.

(a) All valves and boiler mountings and attachments shall be opened up and examined by the marine inspector after each four years of service.

(b) All boiler mounting studs or bolts shall be examined after each 8 years of service.

(c) (1) Boiler mountings shall be removed from the boiler for examination after each eight years of service where any of the following conditions exist:

(i) Boilers having boiler mountings attached directly to the boiler plating by screwed studs and nuts.

(ii) Boilers having boiler mountings attached to a reinforcing pad by screwed studs and nuts; and this pad is attached directly to the boiler plating.

(iii) Boilers having boiler mountings so installed that a satisfactory examination of these mountings or of their attaching studs cannot be made by removing the bonnet and internal parts of the valve.

(2) Where boiler mountings or valves are attached to boiler nozzles and a satisfactory internal examination of these mountings or valves and their attaching studs, bolts, or other means of attachment, can be performed by opening up the valves, such mountings or valves need not be removed from the boiler unless in the opinion of the Officer in Charge, Marine Inspection, such action is necessary.

(d) The Officer in Charge, Marine Inspection, may require the examinations prescribed in this section to be made at more frequent intervals, if in his opinion such action is necessary to be assured of the safety of the boiler and its attachments.

(e) Water columns, gage glasses, and gage cocks shall be examined to determine that they are in satisfactory working order.

(f) Steam gages on boilers or main steam lines shall be examined and checked for accuracy.

(g) The marine inspector shall examine the fusible plugs.

§ 61.20-25 Boilers of foreign-built vessels admitted to American registry.

(a) Where foreign-built vessels are admitted to American registry the Officer in Charge, Marine Inspection, shall endeavor to secure drawings from which the boilers were constructed and a record of the chemical and physical properties of the material entering into the construction of the boilers. Before a certificate of inspection of a vessel is issued by any Officer in Charge, Marine Inspection, the requirements of this section shall be met.

(b) The drawings if available shall be examined to determine the maximum allowable pressure in accordance with the regulations in this subchapter, and the test reports of the material shall be carefully checked to determine whether the material used in the construction of the boilers is safe.

(c) The boiler or boilers shall be measured in order to obtain accurate data, which data shall be embodied in the report of the inspector making the examination. All plates shall be drilled and gaged by the inspector to determine the actual thickness, and upon the thickness thus obtained the maximum allowable pressure shall be based. The furnaces shall be trammed to ascertain if there is any distortion. The safety valves on the boiler and its superheater shall be Coast Guard approved safety valves designed, constructed and flow-tested in conformance with Subpart 162.001 of Subchapter Q (Specifications) of this chapter. The safety valves and mountings shall be thoroughly examined to determine if they are in good working condition and if their capacity is ample.

(d) Each section of the steam pipe shall be drilled and gaged, and, where bends occur in the piping, they shall be drilled in the outer wall of the bends to determine the thickness thereof.

(e) When the inspection is completed and steam is raised on the boilers, an accumulation test shall be conducted, where required, in accordance with the provisions of § 52.65-5 of this subchapter to establish the fact that the safety valves have ample relieving capacity.

(f) Where drawings of the boilers and test reports of the material entering into their construction cannot be obtained, the maximum allowable pressure shall be based on the actual thickness of material found and an assumed tensile strength not to exceed 60,000 p. s. i., together with the general condition of the boilers: *Provided*, That the maximum allowable pressure thus obtained shall not exceed in any case the maximum pressure allowed by the certificate issued by the government under whose flag the vessel formerly operated.

Subpart 61.25—Tests and Inspections of Pressure Vessels

§ 61.25-1 Scope.

For exemption of certain pressure vessels from shop inspection, see § 54.01-1 of this subchapter.

§ 61.25-3 Welded pressure vessels under construction.

(a) The manufacturer shall submit class I welded pressure vessels for shop inspection at such stages of partial completion as may be requested by the inspector.

(b) The first inspection of class II welded pressure vessels shall be performed during the welding of the longitudinal joint. At this time the inspector shall check the material and fit-up of the work, and ascertain that only welders who have passed the required tests are employed.

(c) A second inspection of class II welded pressure vessels shall be made during the welding of the circumferential

joints. At this time the inspector shall check any new material being used which may not have been examined at the time of the first inspection, also the fit-up of the vessel at this stage of fabrication, and in addition, observe the welding to ascertain that only welders who have passed the required tests are employed.

(d) For class III welded pressure vessels, one inspection shall be made during the welding of the longitudinal joint. If there is no longitudinal joint, the inspection shall be made during the welding of a circumferential joint. At this time the inspector shall check the material and fit-up of the work and see that only welders who have passed the required tests are employed.

§ 61.25–5 New pressure vessels.

(a) Except as otherwise provided for in this section, upon completion of a new pressure vessel one of the following applicable hydrostatic tests shall be made in the presence of an inspector:

(1) Riveted construction: 1½ times the maximum allowable pressure. (See § 61.25–10.)

(2) Welded and brazed construction: 1½ times the maximum allowable pressure. (See § 61.25–15.)

(3) Cast construction: 2 times the maximum allowable pressure.

(b) Pressure vessels containing refrigerants shall be leak-tested with gas after installation to the design pressures specified in § 55.13–5 of this subchapter.

(c) Hydraulic accumulators used in engine starting systems shall be leak-tested to the design pressure after installation.

(d) Pressure vessels designed and/or supported so that they cannot be safely filled with water, or which cannot be dried and are to be used in a service where traces of the testing medium cannot be tolerated, shall be pneumatically tested in accordance with § 61.25–16.

§ 61.25–10 Hydrostatic test of riveted pressure vessels.

(a) Riveted pressure vessels shall be hydrostatically tested to not less than 1½ times the maximum allowable pressure for a sufficient time to permit an inspection of all joints and connections.

(b) The tightness of the rivets and the riveted joints shall be tested by tapping the heads with a rivet-testing hammer.

(c) Loose, cracked, and burned rivets shall be replaced.

(d) The inspector shall examine the butt straps and ends of shell plates forming the longitudinal joints to ascertain that they are formed to the proper curvature and that the butt straps are properly fitted at the girth joint intersections.

§ 61.25–15 Hydrostatic test of welded and brazed pressure vessels.

(a) All welded or brazed pressure vessels shall satisfactorily pass the hydrostatic test prescribed by this section, excepting those unfired pressure vessels noted under § 61.25–16.

(b) The hydrostatic test pressure shall be at least equal to 1½ times the maximum allowable pressure stamped on the pressure vessel, multiplied by the ratio of the stress value "*S*" at the test temperature to the stress value "*S*" at the design temperature for the materials of which the pressure vessel is constructed. The values for "*S*" shall be taken from Table 52.05–10(a) in § 52.05–10 for ferrous materials and Table 54.03–10(c) in § 54.03–10 for nonferrous materials. The value of "*S*" at test temperature shall be that taken for the material at the tabulated value of temperature closest to the test temperature. The value of "*S*" at design temperature shall be as interpolated from the appropriate table. No ratio less than one shall be used. The design shall consider the combined stress during hydrostatic testing due to pressure and the support reactions. This stress shall not exceed 90 percent of the yield stress of the material at the test temperature. In addition, the adequacy of the supporting structure, during hydrostatic testing, shall be considered in the design.

(c) The hydrostatic test pressure shall be applied for a sufficient period of time to permit a thorough examination of all joints and connections. The test shall not be conducted until the vessel and liquid are at approximately the same temperature.

(d) Pinholes, cracks, or other defects detected during the hydrostatic test or upon examination shall be repaired as required by Part 58 of this chapter.

(e) Vessels requiring stress relieving shall be stress-relieved after any welding repairs have been made.

(f) After repairs have been made the vessel shall again be tested in the regular way, and if it passes the test, the inspector shall accept it. If it does not pass the test, the inspector can order supplementary repairs, or, if in his judgment the vessel is not suitable for service, he may permanently reject it.

§ 61.25–16 Pneumatic testing of pressure vessels.

(a) Pneumatic testing of welded pressure vessels shall be permitted only for those units which are so designed and/or supported that they cannot be safely filled with water, or which cannot be dried and are to be used in a service where traces of the testing medium cannot be tolerated.

(b) Proposals to pneumatically test shall be submitted to the Commandant for approval.

(c) Pneumatic testing shall be limited to unfired pressure vessels designed and constructed to the requirements of Class I pressure vessels.

(d) The pneumatic test shall be 1.25 (1¼) times the maximum allowable pressure of the vessel.

(e) The pneumatic test of pressure vessels shall be accomplished as follows:

(1) The pressure on the vessel shall be gradually increased to not more than half the test pressure.

(2) The pressure will then be increased at steps of approximately one-tenth the test pressure, until the test pressure has been reached.

(3) The pressure will then be reduced to maximum allowable pressure of the vessel to permit examination.

(f) Pressure vessels pneumatically tested shall also be leak-tested. The test shall be capable of detecting leakage consistent with the design requirements of the pressure vessel. Details of the leak test shall be submitted to the Commandant for approval.

(g) After satisfactory completion of the pneumatic pressure test, the vessel may be stamped in accordance with § 61.40–5. A marine inspector shall observe the pressure vessel in a loaded condition at the first opportunity following the pneumatic test. The tank supports and saddles, connecting piping, and insulation if provided shall be examined to determine they are satisfactory and that no leaks are evident.

(h) The pneumatic test is inherently more hazardous than a hydrostatic test, and suitable precautions shall be taken to protect personnel and adjacent property.

§ 61.25–20 Pressure vessels in service.

(a) At each initial and subsequent inspection for certification the marine inspector shall examine or test all unfired pressure vessels to the extent necessary to determine that their condition is satisfactory and that they are fit for service intended.

(b) Unfired pressure vessels which are fitted with manholes or other inspection openings, so they can be satisfactorily examined internally, except as otherwise exempted by provisions of this section, shall be opened biennially at the regular annual or biennial inspection and thoroughly examined internally and externally. Such pressure vessels are not required to be hydrostatically tested unless defects are found which in the marine inspector's opinion may impair the safety of the pressure vessel. In this case a hydrostatic test shall be applied at a pressure equal to 1¼ times the maximum allowable pressure.

(c) Tubular heat exchangers, hydraulic accumulators, and those pressure vessels used in refrigeration service shall be examined under operating conditions at the regular annual or biennial inspection.

(d) All unfired pressure vessels, other than those exempt by the provisions of this section, shall be subjected to a hydrostatic test 1¼ times the maximum allowable pressure biennially at the regular annual or biennial inspection.

(e) The following unfired pressure vessels will not normally be subjected to a hydrostatic test:

(1) Tubular heat exchangers.

(2) Pressure vessels used in refrigeration service.

(3) Hydraulic accumulators.

(4) Unfired pressure vessels which have been satisfactorily examined internally by a marine inspector and in which no defects have been found which impair the safety of the pressure vessel.

(5) Unfired pressure vessels which have an internal volume of not more than 5 cubic feet and a maximum allow-

able pressure of not more than 100 pounds per square inch.

(6) Compression tanks containing water under pressure, including those containing an aircushion, subject to pressures not exceeding 100 pounds per square inch and temperatures not exceeding 200 degrees F., except those fitted with permanent air charging lines.

(7) All unfired pressure vessels having a maximum allowable working pressure not exceeding 15 pounds per square inch.

(8) Pressure vessels containing mediums at or below pressures and temperatures specified in Table 61.25-20(e).

TABLE 61.25-20(e)

Service	Pressure p.s.i.	Temperature °F.
Steam, gas, or vapors	15	.....
Fuel oil	100	150
Lubricating oil	100	200
Liquids, except fuel oil, and lubricating oil	100	200

(9) Pressure vessels which have been pneumatically tested in accordance with § 61.25-16.

(f) Unfired pressure vessels containing liquefied compressed gases or hazardous liquids shall be inspected and tested as required by the applicable regulations published in Subchapter D (Tank Vessels) and Subchapter N (Dangerous Cargoes) of this chapter.

(g) Bulk storage tanks containing refrigerated liquefied CO_2 gas for use on board vessels as a fire extinguishing agent shall be subjected to a hydrostatic test at the periodic inspection period on the eighth year of the installation and at eight-year intervals thereafter. The hydrostatic test pressure shall be 1½ times the allowable pressure. At the conclusion of the hydrostatic test, the tank shall be drained and an internal examination made. Portions of the jacket and lagging on the underside of the tank shall be removed at the time of the hydrostatic test as deemed necessary by the marine inspector so as to determine the external condition of the tank.

(h) (1) Pressure vessels which have been pneumatically tested shall be thoroughly examined internally and externally biennially at the regular annual or biennial inspection, except in those instances where the inspection interval is prescribed otherwise by the specific regulations applicable to the product carried in Subchapter D (Tank Vessels), Subchapter I (Cargo and Miscellaneous Vessels), or Subchapter N (Dangerous Cargoes) of this chapter. For those tanks the design of which precludes a thorough internal or external examination, the thickness shall be determined by nondestructive method acceptable to the Officer in Charge, Marine Inspection.

(2) Such pressure vessels in service are not required to be pneumatically tested unless repairs have been made to them, or unless defects are found which in the opinion of the marine inspector, may impair the safety of the pressure vessel. If required, the pneumatic test shall be conducted in accordance with § 61.25-16.

Subpart 61.30—Tests and Inspection of Piping, Valves, and Fittings

§ 61.30-1 Scope.

In conducting hydrostatic tests on piping, the required test pressure shall be maintained for a sufficient length of time to permit an inspection to be made of all joints and connections, and the setting of the relief valve or safety valve will be considered as establishing the maximum allowable pressure of the system.

§ 61.30-5 Shop test.

(a) The manufacturer shall test all valves and pipefittings, except pipe flanges, wrought steel welding fittings and welding necks, to a hydrostatic shell pressure as follows:

(1) For steam ratings:

(i) Bronze, malleable iron and cast iron—2 times the primary pressure rating marked on the valve or fitting.

(ii) Steel—The respective test pressure as prescribed in the American Standard for Steel Pipe Flanges and Flanged Fittings (ASA B16.5).

(2) For liquid or gas service not exceeding 150 degrees F.:

(i) Bronze or malleable iron—1½ times the secondary pressure rating marked on the valve or fitting.

(b) Special valves, such as manifolds, scuppers, seacocks and appurtenances, shall be tested to twice the design pressure stamped thereon.

(c) Special welded pipe fittings fabricated with a longitudinal joint which are not manufactured in conformance with the A. S. T. M. Standard specified in Subpart 51.46 of this subchapter shall be tested as required by § 56.01-85 of this subchapter.

(d) Hydraulic piping assemblies and associated hydraulic equipment components, including hydraulic steering gear, in lieu of being tested at the time of installation, may be shop tested by the manufacturer to 1½ the maximum allowable pressure of the system. The required test pressure shall be maintained for a sufficient amount of time to check all components for strength and porosity and to permit an inspection to be made of all connections.

§ 61.30-10 Installation test.

(a) The following piping systems shall be hydrostatically tested in the presence of a marine inspector at a pressure of 1½ times the maximum allowable pressure:

(1) Class I steam, feed-water and blowoff piping. Where piping is attached to boilers by welding without practical means of blanking off for testing, the piping shall be subjected to the same hydrostatic pressure to which the boilers are tested. The maximum allowable pressures of boiler feed-water and blowoff piping shall be the design pressures specified in §§ 55.10-10(a)(3) and 55.10-15(b) in Part 55 of this subchapter.

(2) Fuel oil discharge piping between the pumps and the burners, but not less than 500 pounds per square inch.

(3) High-pressure piping for tank-cleaning operations.

(4) Flammable or corrosive liquids and compressed gas cargo piping, but not less than 150 pounds per square inch.

(5) Any Class I piping not specifically listed in this paragraph.

(6) Cargo oil piping.

(7) Firemains, but not less than 150 pounds per square inch.

(8) Fuel oil transfer and filling piping.

(9) Class I compressed air piping.

(b) Refrigeration piping shall be leak-tested to the design pressures as specified in § 55.13-5 of this subchapter.

(c) Hydraulic piping assemblies and associated hydraulic equipment components which have been tested in conformance with § 61.30-5(d) and so certified by the manufacturer, may be tested after installation as a complete assembly by stalling the driven unit in a safe and satisfactory manner and by blowing the relief valves. Otherwise, these systems shall be hydrostatically tested in the presence of an inspector at a pressure of 1½ times the maximum allowable pressure.

(d) Piping systems not specifically listed in this section shall be tested under working conditions.

(e) Arc- or gas-welded pipe joints of Class I piping which are not examined by radiography shall be given a hammer test as required by § 61.25-15.

§ 61.30-15 Piping in service.

(a) Main steam piping shall be subjected to a hydrostatic test equal to 1¼ times the maximum allowable pressure at the same periods prescribed for boilers in § 61.20-15. The hydrostatic test shall be applied from the boiler drum to the throttle valve. If the covering of the piping is not removed, the test pressure shall be maintained on the piping for a period of ten minutes, and, if any evidence of moisture or leakage is detected, the covering shall be removed and the piping thoroughly examined.

(b) Steam piping subject to main boiler pressure and exceeding 3 inches in diameter, except as otherwise provided for in paragraph (a) of this section, shall be subjected to a hydrostatic test pressure of 1¼ times the maximum allowable pressure after each 4 years of service. If the covering of the piping is not removed, the test pressure shall be maintained on the piping for a period of ten minutes, and, if any evidence of moisture or leakage is detected, the covering shall be removed and the piping thoroughly examined.

(c) The setting of safety valves or relief valves on reduced pressure lines, evaporators, feed water heaters, and other pressure vessels shall be checked by the inspector at each regular annual or biennial inspection.

§ 61.30-20 Sea chests, sea valves and strainers.

(a) Sea chests, sea valves, sea strainers and bilge injection valves shall be opened up for examination at the time of drydocking if deemed necessary by an inspector.

Subpart 61.35—Proof Hydrostatic Tests

§ 61.35–1 Hydrostatic tests of boilers and appurtenances to determine pressure rating.

(a) *Scope.* (1) Where it is necessary to test a pressure vessel, or appurtenance, or any pressure part thereof, to determine a pressure rating in accordance with the provisions of § 52.01–70 of this subchapter the procedure specified in this subpart shall be adhered to as closely as practicable.

(2) This method of test is applicable only to materials having a definite proportional or elastic limit such as carbon and alloy steels. It is not applicable to materials with indefinite or indeterminate proportional limits such as cast iron and most nonferrous materials. The principle upon which the test is based assumes that the most highly stressed point in the pressure part will be subjected to a permanent set when the stress at this location reaches the proportional or elastic limit. Since the stress will be directly proportional to the hydrostatic pressure, the determination of the pressure which stresses the weakest point to the proportional limit will permit a calculation of the maximum allowable pressure that will result in a safe stress for the material from which the part is made at the maximum operating temperature.

(b) *Materials.* The structure shall be made from material conforming to the requirements of the appropriate subpart of Part 51 of this subchapter.

(c) *Workmanship.* The dimensions, thickness, and physical properties of the structure to be tested shall not vary materially from those actually used. If possible, the structure to be tested may be selected at random from a quantity of such intended for use.

(d) *Preparation for test.* (1) It is necessary to test only the weakest point of the structure but several points may be checked to make certain that the weakest one is included. The less definite the location of the weakest point, the more points shall be checked.

(2) The movement of the reference points may be measured with reference to a fixed surface, or two reference points may be located on opposite sides of a symmetrical structure and the total deformation between those two points measured.

(3) Indicating micrometer gages accurate to 0.001 inch are most suitable for measuring deformation of the structure at the reference points although any form of accurate micrometer may be used.

(4) A hand-test pump is satisfactory as a source of hydrostatic pressure. Either a test gage or a reliable gage which has been calibrated with a test gage shall be attached to the structure.

(5) The maximum hydrostatic pressure that shall be provided will vary from two or three times the expected maximum allowable pressure for carbon-steel structures.

(6) The location of the weakest point of the structure may be determined by applying a thin coating of plaster of paris or similar material, and noting where the surface coating starts to break off under hydrostatic test. The coating shall be allowed to dry before the test is started.

(e) *Hydrostatic tests.* (1) The first application of hydrostatic pressure shall be approximately the expected maximum allowable pressure, or the tests may be arranged with a view to making not less than 10 applications of pressure in approximately equal increments between the initial test pressure and the final test pressure.

(2) When each increment of pressure has been applied, the valve between the pump and the structure under test shall be closed and the pressure gage watched to see that the pressure is maintained and no leakage occurs. The total deformation at the reference points shall be measured and recorded and the hydrostatic pressure also recorded. The pressure shall then be released and each point checked for any permanent deformation which may be recorded. Only one application of each increment of pressure is necessary. The pressure shall be increased by substantially uniform increments, and readings taken until the elastic limit of the structure has obviously been exceeded.

(3) The pressure part shall not have been subjected to a pressure greater than twice the maximum allowable pressure prior to making the proof hydrostatic test.

§ 61.35–5 Proportional limit method.

(a) *Physical characteristics of metal.* (1) The proportional limit of the material should be determined in accordance with A. S. T. M. Specification E8, Methods of Tension Testing of Metallic Materials. This test shall be made from a number of specimens cut from the part tested, in order to assure that the average proportional limit of the material in the part tested is used to calculate the allowable pressure.

(2) The specimens shall be cut from a location where the stress during the test has not exceeded the proportional limit, so that the specimens will be representative of the material as tested. The specimens shall not be cut with a flame torch.

(b) *Plotting curves.* In plotting curves, a single cross-section sheet may be used for each reference point of the structure. A scale of 1 inch=0.01 inch deformation, and a scale of at least 1 inch equals the approximate test pressure increments have been found satisfactory. Plot two curves for each reference point, one showing total deformation under pressure and one showing permanent deformation when the pressure is removed.

(c) *Determining proportional limit of pressure part.* In determining the proportional limit of pressure parts, the following procedure shall be employed:

(1) Locate the proportional limit on each curve of total deformation as the point at which the total deformation ceases to be proportional directly to the hydrostatic pressure. Draw a straight line that will pass through the average of the points that lie approximately in a straight line. The proportional limit will occur at the value of hydrostatic pressure where the average curve through the points deviates from the straight line.

(2) In pressure parts such as headers, where a series of similar weak points occur, the average hydrostatic pressure corresponding to the proportional limits of the similar points may be used.

(3) The proportional limit obtained from the curve of total deformation may be checked from the curve of permanent deformation by locating the point where the permanent deformation begins to increase regularly with further increases in pressure. Permanent deformations of a low order that occur prior to the point actually corresponding to the proportional limit of the structure, resulting from the equalization of stresses and irregularities in the material, may be disregarded.

(4) It should be made certain that the curves show the deformation of the structure and not slip or displacement of reference surfaces, gauges, or the structure.

(d) *Determining maximum allowable pressure.* (1) Having determined the hydrostatic pressure when the proportional limit of the weakest point of the vessel was reached, the corresponding maximum allowable pressure may be determined by formula (1):

$$P=\frac{HS}{E} \qquad (1)$$

where:

P = maximum allowable pressure, in p. s. i.
H = hydrostatic pressure at the proportional limit of the pressure part, in p. s. i.
S = Maximum allowable stress, 80 percent of the values, as given in Table 52.05–10(a).
E = average proportional limit of the material, in p. s. i.

(2) For carbon steel material, complying with the material specifications in Part 51 of this subchapter and with a minimum tensile strength not over 62,000 p. s. i., the proportional limit may be assumed to be two-fifths of the average tensile strength of the specified range. Where no range is specified, the average tensile strength may be assumed as 5,000 p. s. i. greater than the minimum. This alternate procedure will eliminate the necessity for cutting tensile specimens and determining the actual proportional limit above the normal value. The pressure part shall be normalized after forging or forming.

(e) *Retests.* A retest will be allowed on an additional similar vessel if errors or irregularties are obvious in the results.

Subpart 61.40—Markings

§ 61.40–1 Boilers.

(a) Upon satisfactory completion of the tests and inspection of a new boiler the following data shall be stamped on

the front head of fire-tube boilers and on the drum head of water-tube boilers:

(Name of fabricator and serial number)

---- p.s.i.
(Maximum allowable pressure)

---- p.s.i.
(Hydro test pressure)

---- p.s.i.
(Steam test pressure)

(U.S.C.G. No.)

(C.G. Symbol)

(Inspector's initials)

(Month and year fabricated)

(b) The inscription on the boiler and the boiler nameplate, as required in paragraph (a) of this section, shall contain the following entry for steam tests: "Steam test ____ p. s. i.," which shall follow the notation for hydrostatic test.

(c) The data shall be legibly stamped and shall not be obliterated during the life of the boiler. In the event that the portion of the boiler upon which the data is stamped is to be insulated or otherwise covered, the data shall be transferred to a metal nameplate which shall be attached to the boiler casing or the uptake. The nameplate shall be maintained in a legible condition so that the data can be easily read.

§ 61.40–5 Unfired pressure vessels.

(a) After a marine inspector has examined a new pressure vessel subject to inspection and has determined that the vessel has been constructed in accordance with the applicable parts of this subchapter, and the vessel has satisfactorily withstood the required tests, the following data shall be stamped thereon:

(Name and address of fabricator)

---- p.s.i.
(Maximum allowable pressure)

---- p.s.i.
(Hydro test pressure)

(O.C.M.I. No., inspector's initials, and C.G. symbol)

(Mfr. serial No.)

(Month and year)

(Riveted, brz., welded (class))

(b) Those pressure vessels which must be pneumatically tested shall be stamped with "Pneumatic test pressure ____ p.s.i.".

Subpart 61.45—Official Forms

§ 61.45–1 Scope.

This subpart includes descriptions of the official forms required to be submitted to the Coast Guard by the regulations in this subchapter. Copies of the forms may be obtained upon request from the nearest Officer in Charge, Marine Inspection, or the Commandant (MMT), United States Coast Guard, Washington, D.C., 20226.

§ 61.45–5 Form CG–2935; boiler data report; manufacturer's certification.

The manufacturer of each boiler to be used on vessels subject to inspection by the Coast Guard shall submit to the Officer in Charge, Marine Inspection, at or nearest the place where the manufacturer's plant is located, a data report in triplicate on form CG–2935 together with a certification that the data is correct and that the material and fabrication of this boiler comply with all the regulations applicable thereto.

§ 61.45–10 Form CG–2936; unfired pressure vessel data report; manufacturer's certification.

The manufacturer of unfired pressure vessels to be used on vessels subject to inspection by the Coast Guard shall submit to the Officer in Charge, Marine Inspection, at or nearest the place where the manufacturer's plant is located, a data report in triplicate on form CG–2936 together with a certification that the data is correct and that the material and fabrication comply with all the regulations applicable thereto.

§ 61.45–15 Form CG–935A; affidavit of manufacturer of class B material or appliances.

The manufacturer of either class B materials or appliances for use on vessels subject to inspection by the Coast Guard and to the regulations in this subchapter shall submit to the Commandant (MMT), United States Coast Guard, Washington, D.C., 20226, an affidavit on form CG–935A certifying that certain product(s) of his manufacture furnished directly or through agents or dealers for use on vessels subject to inspection by the Coast Guard will comply with all regulations applicable thereto.

SUBCHAPTER G—MARINE ENGINEERING INSTALLATIONS CONTRACTED FOR PRIOR TO JULY 1, 1935

PART 66—GENERAL

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AUTHORITY: The provisions of this Part 66 issued under R.S. 4405, as amended, 4462, as amended; 46 U.S.C. 375, 416. Interpret or apply R.S. 4399, as amended, 4400, as amended, 4417, as amended, 4417a, as amended, 4418, as amended, 4421, as amended, 4426–4431, as amended, 4433, as amended, 4434, as amended, 4453, as amended, 4488, as amended, 4491, as amended, sec. 14, 29 Stat. 690, as amended, sec. 10, 35 Stat. 428, as amended, 41 Stat. 305, as amended, secs. 1, 2, 49 Stat. 1544, 1545, as amended, sec. 17, 54 Stat. 166, as amended, sec. 3, 54 Stat. 347, as amended, sec. 3, 70 Stat. 152, sec. 3, 68 Stat. 675; 46 U.S.C. 361, 362, 391, 391a, 392, 399, 404–409, 411, 412, 435, 481, 489, 366, 395, 363, 367, 526p, 1333, 390b, 50 U.S.C. 198; E.O. 11239, July 31, 1965, 30 F.R. 9671, 3 CFR, 1965 Supp. Treasury Department Orders 120, July 31, 1950, 15 F.R. 6521; 167–14, Nov. 26, 1954, 19 F.R. 8026; 167–20, June 18, 1956, 21 F.R. 4894; CGFR 56–28, July 24, 1956, 21 F.R. 5659; 167–38, Oct. 26, 1959, 24 F.R. 8857.

Subpart 66.01—General Provisions

§ 66.01–1 Authority.

(a) The authority to prescribe regulations generally is set forth in R.S. 4405 and 4462, as amended (46 U.S.C. 375 and 416), as well as in other provisions of Title 52 of the Revised Statutes and acts amendatory thereof or supplemental thereto. Under the provisions of R.S. 4403, as amended (46 U.S.C. 372), the

Commandant, United States Coast Guard, superintends the administration of the vessel inspection laws and is required to produce a correct and uniform administration of the inspection laws, rules, and regulations.

§ 66.01–5 Assignment of functions.

By Reorganization Plan No. 3 of 1946, effective July 16, 1946, the marine inspection functions of the former Bureau of Marine Inspection and Navigation and its officers and employees were transferred to the Commandant, United States Coast Guard. By Reorganization Plan No. 26 of 1950, effective July 31, 1950, 3 CFR, 1950 Supp., p. 178, the functions formerly vested in the Commandant, United States Coast Guard were transferred to the Secretary of the Treasury with certain specific exceptions. The Secretary of the Treasury by an order dated July 31, 1950 (15 F. R. 6521), delegated to the Commandant the functions formerly performed by him under Reorganization Plan No. 3 of 1946.

§ 66.01–10 Purpose of regulations.

The purpose of the regulations in this subchapter is to set forth uniform minimum requirements for marine engineering in accordance with the intent of Title 52 of the Revised Statutes and acts amendatory thereof or supplemental thereto, as well as to implement various International Conventions for Safety of Life at Sea and other treaties which affect the merchant marine. The regulations are necessary to carry out the provisions of law affecting inspected vessels and such regulations have the force of law.

§ 66.01–15 Application of regulations.

(a) The regulations in this subchapter, apply only to installations contracted for or built prior to July 1, 1935, and contain specifications and requirements for materials, design, construction, installation and inspection of boilers, unfired pressure vessels, safety valves and appurtenances, including piping system, upon the strength and efficiency of which safety of life is dependent.

(b) The regulations in Subchapter F (Marine Engineering) of this chapter, apply to installations contracted for or built on or after July 1, 1935.

(c) Where existing vessels are reboilered, the mountings and attachments, including feed and blowoff valves and fittings, shall be renewed in accordance with the regulations in Subchapter F (Marine Engineering) of this chapter in effect at the time such work is contracted for or built. The steam piping shall be gaged and examined by the Officer in Charge, Marine Inspection, and if found to be of the thickness required at the time the piping was installed it may be continued in use so long as the Officer in Charge, Marine Inspection, is of the opinion that the piping may be safely continued in use. Changes in specifications of articles of equipment shall not apply to such articles which have been passed as satisfactory until replacement shall become necessary.

Subpart 66.03—Definition of Terms Used in This Subchapter

§ 66.03–1 Commandant.

The term "Commandant" means the Commandant of the Coast Guard.

§ 66.03–5 Coast Guard District Commander.

The term "Coast Guard District Commander" means an officer of the Coast Guard designated as such by the Commandant to command all Coast Guard activities within his district, which include the inspections, enforcement, and administration of Title 52, Revised Statutes, and acts amendatory thereof or supplemental thereto, and rules and regulations thereunder.

§ 66.03–10 Officer in Charge, Marine Inspection.

The term "Officer in Charge Marine Inspection," means any person from the civilian or military branch of the Coast Guard designated as such by the Commandant and who under the superintendence and direction of the Coast Guard District Commander is in charge of an inspection district for the performance of duties with respect to the inspection, enforcement, and administration of Title 52, Revised Statutes, and acts amendatory thereof or supplemental thereto, and rules and regulations thereunder.

§ 66.03–15 Marine inspector or inspector.

The terms "marine inspector" or "inspector" mean any person from the civilian or military branch of the Coast Guard assigned under the superintendence and direction of an Officer in Charge, Marine Inspection, or any other person as may be designated for the performance of duties with respect to the inspections, enforcements, and the administration of Title 52, Revised Statutes, and acts amendatory thereto, and rules and regulations thereunder.

§ 66.03–20 Requirements.

The term "requirements" refers to process of manufacture, characteristic, physical and chemical properties, tests, workmanship, and finish of materials.

§ 66.03–25 Headquarters.

The term "headquarters" means the Office of the Commandant, United States Coast Guard, Washington, D.C., 20226.

Subpart 66.05—General Material Requirements

§ 66.05–1 Repair or replacement parts.

(a) Plates and steel bars subject to tensile stress used in the repair or replacement of pressure parts of boilers shall be tested, inspected, and stamped by an inspector in accordance with the requirements of Title 52 of the Revised Statutes of the United States, for Class A material, and shall conform to the applicable requirements of Part 51 of Subchapter F (Marine Engineering) of this chapter.

(b) Material used for pressure parts in the repair of pressure vessels other than boilers and in the repair or replacement of boiler tubes, piping, valves and fittings may be of Class B certified material conforming to the applicable requirements of Part 51 of Subchapter F (Marine Engineering) of this chapter.

§ 66.05–5 General classification of materials.

(a) *General.* The materials to be used in the construction and for the repair of boilers and unfired pressure vessels, piping, valves, fittings, and appurtenances shall be of three general classes of which Classes A and B shall be used for pressure parts and Class C may be used for other parts as specified.

(b) *Class A.* Tested materials manufactured under the supervision of the Coast Guard, test of which shall be witnessed by an inspector.

(c) *Class B.* Certified materials tested by the manufacturers, and certified by them as conforming to the requirements.

(d) *Class C.* Materials for nonpressure parts of boilers or unfired pressure vessels such as casing for water-tube boilers, uptakes, furnace fronts, and operating equipment shall be of good commercial quality. No detail requirements are herein specified for material in this class. Class C materials shall be accepted by inspectors without requiring tests or certification by manufacturers.

§ 66.05–10 Basic information requirements.

(a) When ordering Class A material for the repair of boilers or unfired pressure vessels installed on vessels subject to the inspection of the Coast Guard, the manufacturer of the material shall, as far as practicable, furnish the following information to the Officer in Charge, Marine Inspection, at or nearest the place where the boiler or unfired pressure vessel is to be repaired.

(1) Name and location of manufacturer's works.

(2) Type of boiler or unfired pressure vessel.

(3) Manufacturer's slab or plate number.

(4) Design pressure and temperature.

(5) Vessel's name.

§ 66.05–15 Inspection and testing of class A material.

Inspectors shall have free entry at all times to those parts of the works where material subject to the regulations in this part is being manufactured. The manufacturer shall afford inspectors all reasonable facilities to satisfy them that the material is being manufactured in accordance with the requirements of the Commandant. Unless otherwise authorized, tests and inspection shall be made at the place of manufacture prior to shipment and shall be so conducted as not to interfere unnecessarily with the operation of the works. Inspectors shall assure themselves that test specimens are marked for positive identification with the materials which they represent. Unless otherwise specified, tests shall be made at ordinary temperature.

§ 66.05–20 Chemical analyses.

(a) A ladle analysis of each melt of Class A or B materials as specified by Part 51 of Subchapter F (Marine Engineering) of this chapter, shall be made by the manufacturer and a certified report thereof shall be furnished by him to the inspector upon request. This analysis shall be made from a test ingot taken during the pouring of the melt. The chemical composition thus determined shall conform to the specified requirements.

(b) A check analysis may be made at the discretion of the Commandant from test specimens representing material for which chemical composition is specified in any section of this part, in either Class A or B. The chemical composition thus determined shall conform to the requirements.

§ 66.05–25 Certification of class B material.

(a) Certification of chemical analyses and physical tests of materials of Class B shall be an affidavit by the manufacturer certifying that all materials of this class supplied by him for marine service do, or will conform to all the requirments in Subchapter F (Marine Engineering) of this chapter applicable thereto.

(b) Materials in this class are not required to be tested in the presence of an inspector, but whenever deemed necessary by the Commandant he may detail an inspector to witness such tests and satisfy himself that the requirements of the specification for Class B materials are met.

§ 66.05–30 Tension tests.

All tension tests shall be made on standard calibrated machines. The yield point in tension tests shall be determined by the drop of the beam or the halt in the gage of the testing machine. Except where otherwise specified in Part 51 of Subchapter F (Marine Engineering) of this chapter, the speed of the crosshead of the machine shall not exceed 1/16 inch per minute per inch of gage length up to the yield point, nor shall it exceed ½ inch per minute per inch of gage length beyond the yield point. Any convenient speed of the crosshead may be used from the start of loading the test specimen until a value estimated as one-half of the yield point is reached. In determining the yield strength by use of an extensometer, the crosshead speed shall not exceed 0.025 inch per minute per inch of gage length. In the event the machine is stopped in taking readings, the speed may be exceeded in the take up only. The ends of all test specimens shall be of form to fit the holders of the testing machine in such a way that the load will be axial.

§ 66.05–35 Test reports.

Inspectors shall report the results of official tests on form CG–934. Duplicate copies thereof shall be forwarded through the Coast Guard District Commander in the district where the material was manufactured to the Coast Guard District Commander in the district where the material is to be fabricated.

§ 66.05–40 Retests.

When the result of any of the physical tests specified for any of the materials does not conform to the requirements, two additional specimens may, at the request of the manufacturer be taken from the same lot and tested in the manner specified, but in such case, both of the specimens shall conform to the requirements. In the case of tension tests, this retest shall be allowed if the percentage of elongation obtained is less than required, or if any part of the fracture is outside of the middle third of the gauge length. If any test specimen develops flaws, it shall be discarded and another specimen from the same lot substituted.

§ 66.05–45 Rejections.

Failure of the tests (or retests) specified in the regulations in this subchapter for each particular material shall be cause for rejection. Unless otherwise required, any rejection shall be reported by the inspector within 5 working days from the receipt of the test specimen. Acceptance of material on results of tests at the place of manufacture shall not prejudice the right to reject any of such material in which injurious defects are subsequently discovered. The manufacturer shall be promptly notified of such subsequent rejections, and the records shall be corrected.

§ 66.05–50 Appeals.

In case of dissatisfaction with the results of any test, the manufacturer may appeal to the Coast Guard District Commander from the decision of the Officer in Charge, Marine Inspection, within 30 days. Should the Coast Guard District Commander sustain the Officer in Charge, Marine Inspection, the manufacturer may appeal to the Commandant within 30 days. Tested specimens which represent rejected material shall be retained for at least 30 days. The decision of the Commandant shall be final.

§ 66.05–55 Process of steel manufacture.

Unless otherwise officially authorized by the Commandant, all wrought steel to be used in the repair of boilers or unfired pressure vessels shall be manufactured by the open-hearth, electric furnace, or crucible process.

§ 66.05–60 Stamping plates and specimens.

(a) Class A plates used for repairs to boilers shall be stamped by the manufacturer, before they are tested, with his name or trademark, the word "Marine", the letter indicating the grade of the steel, and the minimum tensile strength of the plate per square inch of cross-sectional area expressed in thousands. Inspectors shall permit cutting a plate into two or more parts before testing, but each part shall be stamped or match-marked for identification before cutting. All plates accepted by the inspector as conforming to the requirements shall be stamped by him near the manufacturer's stamp with the official stamp of the Coast Guard, the initials of his name, and the serial number. All test specimens shall be ring-stamped or match-marked for identification before being detached. Plates shall be stamped lengthwise in two places on one long side about 18 inches from the edges at the corners. Each butt strap shall be stamped lengthwise of the plate about the middle of the strap.

(b) The impression of the official stamp of the Coast Guard for stamping plates and specimens shall be as shown in Figure 66.05–60.

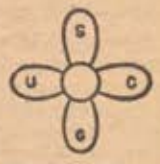


FIGURE 66.05–60—Official stamp.

§ 66.05–65 Stock plates.

Plates may be ordered to be carried in stock ashore or on shipboard for repairs to boilers and unfired pressure vessels. Such plates shall be inspected and tested at the place of manufacture and stamped for identification as stock plates. A test report for such plates shall be furnished to the Coast Guard District Commander of the district where the purchaser is located, with a copy to the purchaser. The Coast Guard District Commander shall furnish a copy thereof to the Officer in Charge, Marine Inspection, where the material is kept in stock, and if the material is to be used by persons other than the original purchaser, they shall also be furnished with a copy of such report, for submittal by them to the Officer in Charge, Marine Inspection, where the repairs are actually to be made before the material may be used. Vessels carrying such stock plates shall obtain and carry identification and test records of each plate. Where such plates are cut into pieces for repairs, the Officer in Charge, Marine Inspection, shall, upon request, stamp each piece so detached for identification with the original plate and a record of such stamping shall be made.

§ 66.05–70 Workmanship and finish.

All materials within the scope of the regulations in this subchapter shall be free from injurious defects and shall have a workmanlike finish.

§ 66.05–75 Heat treatment.

Some of the materials specified in this part require heat treatment. This may consist of annealing, or of normalizing, or of normalizing followed by annealing, or of normalizing followed by a draw back to a temperature below the critical range. Annealing shall consist of allowing material to cool after forging or rolling to a temperature below the critical range, then reheating it to proper temperature to refine the grain and allowing it to cool in the furnace. Normalizing shall consist of allowing material to cool after forging or rolling to a temperature below the critical range, then reheating it to proper temperature to refine the grain and allowing it to cool in still air.

§ 66.05–80 Reclassification of materials.

When more than one grade is specified for any material or purpose and tests of a material of a superior grade fail to meet the requirements, such material may be reclassified and accepted as a specified lower grade if it fulfills the specified requirements for the latter. In such cases, the material shall be restamped or remarked as required for proper identification, and revised records shall be made to cover it.

§ 66.05–85 Alternative materials.

If, in the development of industrial arts, other suitable or improved materials differing from those specified in this part are developed, their use will be given consideration, upon formal application to the Commandant with full information as to the characteristics of the material, and such scientific data and facts as may be necessary to establish the suitability and safety of the material for the use proposed. The material requirements in this subchapter are minimum requirements and are not intended to bar better materials.

Subpart 66.10—Boiler Plate

§ 66.10–1 Inspection and marking.

(a) Every iron or steel plate intended for the construction of boilers to be used on steam vessels shall be stamped by the manufacturer in the following manner, at two diagonal corners, at a distance of about 18 inches from the edges.

(b) Plates to be used in the construction of externally fired boilers, the thickness of which shall not exceed one-half inch for steamers navigated under the provisions of Title 52, Revised Statutes, sections 4399–4500, which will be subject to tensile strain in said boilers, shall be Class A material tested and inspected by an inspector, and such plates shall not be stamped until they have been tested by the inspector, and each of such plates shall then be stamped by the manufacturer in the presence of the inspector with the name of the manufacturer, the place where manufactured, and the minimum number of thousand pounds tensile stress it will bear to the sectional square inch as has been determined by the test.

(c) Plates to be used in the construction of boilers other than the externally fired boilers as described in paragraphs (a) and (b) of this section, for steamers navigated under provisions of Title 52, Revised Statutes, sections 4399–4500, as amended (46 U. S. C. 361–498), which shall be subject to tensile strain in said boilers shall be a material tested and inspected by an inspector and such plates shall be stamped by the manufacturer before same are tested with the name of the manufacturer, the place where manufactured, and the minimum number of pounds the plate will bear to the sectional square inch, expressed in thousands.

(d) Inspectors testing iron or steel plate at the mills where same is manufactured shall allow the mills to shear any plate into butt straps or heads before the coupon from the plate is tested, and they shall accept the statement of the manufacturer that the coupon presented to the inspector for testing was taken from the plate from which the butt straps or heads were cut, and if the coupon meets all the requirements of this subpart the inspector shall stamp, in one place where it is most likely to be left legible after working into the boiler, all heads and butt straps cut from the plate.

(e) All plates which conform to the physical, chemical, and other requirements prescribed in this subchapter shall be stamped by the inspector near the manufacturer's stamp with the official stamp of the Coast Guard, and with the initials of his name and a serial number.

§ 66.10–5 Chemical properties, steel plates.

(a) Steel plates shall be made by open-hearth process, except that steel for plates to be used in the manufacture of boiler tubes may be made by the Bessemer process.

(b) Open-hearth steel shall contain not more than 0.04 percent of phosphorus nor more than 0.05 percent of sulphur.

(c) The manufacturer shall furnish the inspector with each order tested, a certificate stating the process by which the steel was manufactured and a copy of the analysis of each melt. The analysis may, if deemed expedient by the Commandant, be verified at the expense of the manufacturer.

§ 66.10–10 Physical properties, steel plates.

(a) All steel plates tested shall show an elongation of at least 20 percent measured in a gage length of 8 inches.

§ 66.10–15 Physical properties, iron plates.

(a) The tensile strength shall be not less than 45,000 pounds per square inch. The elongation shall be not less than 15 percent. The reduction of area shall be not less than 15 percent for 45,000 p. s. i. tensile strength, and for each increase of 1,000 p. s. i. tensile strength up to 55,000 p. s. i., an addition of 1 shall be made to the required percentage of reduction of area. The bend test specimen shall bend cold through 90 degrees around a curve the radius of which is not greater than one and one-half times the thickness of the specimen.

§ 66.10–20 Tension and bend tests.

(a) All tension test specimens shall be milled to the form as shown in Figure 66.10–20 (a), with the following dimensions: Length at least 16 inches, ends from 1½ to 3½ inches wide by about 3 inches in length, and parallel section at center 1 to 1½ inches wide by 9 inches in length. The percentage of elongation shall be measured in a gage length of 8 inches.

(b) Where specimens are to be tested on the testing machines of the Coast Guard, they shall be 1 inch wide at parallel section in center, and shall not exceed 2 inches in width on the ends.

(c) All bend test specimens shall be at least 12 inches in length and from 1 to 3½ inches in width, and the full thickness as rolled. The edges may be planed. The corners shall not be rounded, but the sharpness may be removed with a fine file. After bending, the specimens shall show no cracks or flaws on the outside of the bent portion.

(d) Two tension tests and one cold-bend test shall be made from each plate as first rolled from a billet, slab, or ingot, the tensile test specimens to be taken from two diagonal corners of the plate, and a cold-bend specimen to be taken transversely from the middle of the top of the plate.

(e) The bend test specimen shall bend cold 180 degrees around a pin without showing any sign of cracking or other injurious defects on the outside of the bent portion, as follows: For plates under 1 inch in thickness the diameter of the pin shall be equal to one and one-half times the thickness of the plate; for plates 1 inch and over, up to and including 1½ inches in thickness, the diameter of the pin shall be equal to three times the thickness of the plate, and for all plates over 1½ inches in thickness the diameter of the pin shall be equal to four times the thickness of the plate.

(f) The finished material shall be free from all injurious defects, and shall have a good and workmanlike finish.

(g) All measurements of test specimens and material shall be made by any standard American gage, and record of tests shall be submitted on Form CG–934.

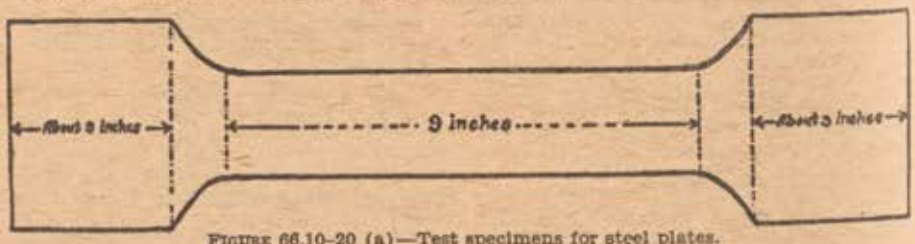


FIGURE 66.10–20 (a)—Test specimens for steel plates.

Subpart 66.15—Steel Bars for Stays and Braces

§ 66.15–1 Tests and inspection.

All steel bars to be used as stays or braces in marine boilers shall be of Class A tested material.

§ 66.15–5 Physical properties.

The minimum tensile strength shall be not less than 58,000 pounds per square inch. The elongation shall be not less than 28 percent in 2 inches or 25 percent in 8 inches.

§ 66.15–10 Tension- and bend-tests.

(a) Two tension-test pieces and two bend-test pieces shall be taken from each heat. The full-size bars within the capacity of the testing machine may be used for tensile tests. Where the full size of the bar is too large for the capacity of the testing machine, the bar may be reduced in size to meet such capacity. To facilitate and insure accurate tests, all bars for tensile and bending tests may be reduced in size.

(b) The minimum tensile strength of each piece shall be not less than 58,000 pounds per square inch of section and each test piece that has been reduced in size shall show an elongation of at least 28 percent in 2 inches. Where the full size of the bar has been used for testing, the test pieces shall show an elongation of at least 25 percent in 8 inches. When the tensile strength of the test piece is more than 63,000 pounds, per square inch of section, each test piece that has been reduced in size shall show an elongation of at least 26 percent in 2 inches. Where the full size of the bar has been used for testing, each test piece shall show an elongation of at least 22 percent in 8 inches.

(c) The pieces for the bend test shall be bent cold to a curve, the inner radius of which is equal to one and one-half times the diameter of the bar without flaws or cracks.

(d) Should any such test bar fail in either the tensile or bending test, no bars from such heat shall be allowed to be used in the construction of any marine boiler. Where a heat of steel bars has been passed by an inspector, separate lots of bars from such heat may be furnished to different boiler manufacturers upon a certificate from the mill that the bars were made from such accepted heat.

§ 66.15–15 Manufacturer's affidavit covering tested stays.

Boiler manufacturers desiring to use tested stays or braces shall be required to furnish the inspectors with the following form of affidavit, duly filled in:

(Form CG–937)

STATE OF _____
County of _____
I hereby certify that I am the _____
_____ of the
(State "owner" or name position)
steam boiler works named _____
_____, situated at _____,
in the State of _____, and that the lot or lots of steel bars from which the test bars were taken and tested by the inspector on the _____ day of _____, 19____, and allowed for use in the steam boiler to be constructed for the steamer _____, and to be allowed a strain not to exceed _____ pounds per square inch of section as a working steam pressure, will be used in the construction of the boiler ____ for the steamer _____, and no material for any braces, stays, or stay bolts required to be made of tested material and to carry a strain equal to _____ pounds per square inch of section will be used as braces, stays, or stay bolts in the construction of the boiler ____ for the said steamer tested by the inspector and approved by him in accordance with the requirements of law.

(Signature) _____

Subscribed and _____ to before
(Sworn or affirmed)
me this _____ day of _____, 19____.

[SEAL] (Signature) _____
Notary Public.

Subpart 66.20—Lapwelded Boiler Tubes

§ 66.20–1 Process.

(a) All lapwelded boiler tubes up to and including 4 inches in diameter shall be made of charcoal iron, or mild steel made by any process.

(b) All lapwelded boiler tubes over 4 inches in diameter, up to and including 30 inches in diameter, shall be made of wrought iron or mild steel, made by any process.

(c) Tubes shall be free from defective welds, cracks, blisters, scale, pits, and sand marks.

§ 66.20–5 Tests.

(a) The following tests shall be made on lapwelded boiler tubes up to and including 4 inches in diameter:

(1) A test piece 2 inches in length cut from a tube shall stand being flattened by hammering until the sides are brought parallel and separated by a distance not greater than one-third the outside diameter of the tube, without showing cracks or flaws, the weld being 45 degrees from the bend.

(2) A second tube shall have a flange turned over at right angles to the body of the tube and shall have a width equal to ⅜ inch. Tubes less than 3 inches in diameter shall only be required to have a flange turned equal to one-eighth of the diameter of the tube. This test shall not be applied to threaded stay tubes.

(3) All the work shall be done cold.

(4) Each tube shall stand an internal hydrostatic pressure of 1,000 pounds per square inch and be struck near both ends while under pressure with a 2-pound hammer or its equivalent without showing signs of weakness or defects.

(5) All steel tubes, except those made of open-hearth steel, shall have the ends properly annealed by the manufacturer before shipment.

(6) All tubes shall stand expanding, flanging over on the tube plate, and beading without flaws, cracks, or opening at the weld, except threaded stay tubes.

(b) The following tests shall be made on lapwelded boiler tubes over 4 inches in diameter, up to and including 30 inches in diameter:

(1) A test piece, 2 inches in length, cut from a tube, shall stand being flattened by hammering until the sides are brought parallel and separated by a distance not greater than one-third the outside diameter of the tube, without showing cracks or flaws, with the weld being 45 degrees from the bend.

(2) Each tube shall stand an internal hydrostatic pressure of 500 pounds per square inch and shall be struck near both ends while under pressure with a 2-pound hammer or its equivalent without showing signs of weakness or defects.

(3) All steel tubes except those made of open-hearth steel shall have ends properly annealed by the manufacturer before shipment.

(4) All tubes shall stand drilling, riveting, and calking, and work necessary to install them into the tube head without showing any weakness or defects.

Subpart 66.25—Seamless Steel Boiler Tubes

§ 66.25–1 Process.

The steel shall be made by the open-hearth process.

§ 66.25–5 Finish.

Tubes shall be free from all surface defects. The defects to be particularly avoided in seamless tubes are tears, snakes, checks, slivers, scratches, laps, pits, rings, and sinks.

§ 66.25–10 Heat treatment.

All seamless steel cold-drawn tubes shall be annealed as a final process. One or more tubes shall be selected at random from each charge of annealing furnace, and coupons cut from same for testing.

§ 66.25–15 Tests.

(a) A piece 3 inches long cut from the first tube shall stand being flattened cold by hammering until the sides are brought parallel and separated by a distance not greater than one-third the outside diameter of the tube, without showing cracks or flaws.

(b) A flange shall be turned cold all around the end of the tube to a width equal to ⅜ inch beyond the outside body of the tube. Tubes less than 3 inches in diameter shall only be required to have a flange turned equal to one-eighth of the diameter of the tube. This test shall not be applied to threaded stay tubes.

(c) Where hot-finished tubes are furnished, the tubes shall pass the same manipulating tests as cold-drawn tubes and shall be subject to the same conditions as to gage, but do not have to be annealed.

(d) Each tube shall be subject to an internal hydrostatic pressure of 1,000 pounds per square inch without showing signs of weakness or defects.

(e) All tubes, except threaded stay tubes, shall stand expanding, flanging over on the tube plate, and beading without flaw or crack.

(f) All tubes shall be carefully gaged and shall not be less than the specified thickness.

§ 66.25–20 Statement or certificate of manufacturer of boiler tubes.

When the manufacturers of boiler tubes file with the Commandant a cer-

tificate duly sworn to that all tubes manufactured by them will stand the tests and meet all the requirements of this part, they shall be accepted by inspectors of the Coast Guard and no other affidavit will be required.

Subpart 66.30—Welded Steel and Iron Pipe

§ 66.30–1 Process.

The pipe material shall be made by the open-hearth or the bessemer process. Welded pipe shall be made by the hammer-weld process.

§ 66.30–5 Physical properties.

(a) *Bessemer steel pipe.* Tensile strength, minimum, 50,000 p.s.i. Elongation in 8 inches, minimum, 20 percent.

(b) *Open-hearth steel pipe.* Tensile strength, minimum, 45,000 p.s.i. Yield point, minimum, 25,000 p.s.i. Elongation in 8 inches, minimum, 20 percent.

(c) *Wrought-iron pipe.* Tensile strength, minimum, 40,000 p.s.i. Yield point, minimum, 24,000 p.s.i. Elongation in 8 inches, minimum, 12 percent.

§ 66.30–10 Tension tests.

(a) Tension tests are not required for pipes up to and including 3½ inches in diameter.

(b) For all diameters exceeding 3½ inches, tension tests shall be made from every 50 pieces furnished, or fraction thereof, and shall show the following results:

(1) *For bessemer steel.* Tensile strength, not less than 50,000 pounds per square inch. Elongation in 8-inch specimen, not less than 20 percent.

(2) *For open-hearth steel.* Tensile strength, not less than 45,000 pounds per square inch. Elongation in 8-inch specimen, not less than 20 percent.

(3) *For iron.* Tensile strength, 40,000 to 48,000 pounds per square inch. Elastic limit, 22,000 to 30,000 pounds per square inch. Elongation in 8-inch specimen, not less than 12 percent.

§ 66.30–15 Flattening tests.

(a) Flattening tests are not required for pipe up to and including 3½ inches in diameter.

(b) For all diameters greater than 3½ inches inside, flattening tests shall be made as follows:

(1) *Steel.* A test piece 2 inches in length cut from a pipe shall stand being flattened by hammering until the sides are brought parallel with the curve on the inside at the ends not greater than one-third the outside diameter of the pipe without showing cracks or flaws, the weld being 45 degrees from the curve.

(2) *Iron pipe.* A test ring three times the thickness in length cut circumferentially from lapwelded wrought-iron pipe shall be crushed down to an inner diameter of one-third the outside diameter of the pipe. Wrought-iron pipe will not stand this test without fracture, but no lapwelded wrought-iron pipe shall be accepted where the break is short or crystalline or shows evidence of defective material or bad welding, and in every case the fiber of the iron shall be shown.

§ 66.30–20 Hydrostatic tests.

(a) Pipes ⅛ inch inside diameter up to and including 3½ inches inside diameter shall be tested before shipment to 600 pounds per square inch hydrostatic pressure.

(b) All pipe above 3½-inch diameter shall be tested before shipment to not less than 500 pounds per square inch hydrostatic pressure.

§ 66.30–25 Finish.

(a) The pipe shall be smooth, straight, and free from defects.

Subpart 66.35—Seamless Steel Pipes

§ 66.35–1 Process.

(a) The steel shall be made by the open-hearth process.

§ 66.35–5 Physical properties.

(a) Tensile strength, minimum, 48,000 pounds per square inch. Yield point, minimum, 26,500 pounds per square inch. Elongation in 2 inches, minimum, 40 percent.

§ 66.35–10 Flattening test.

(a) A test piece 2 inches in length cut from a pipe, shall stand being flattened by hammering until the sides are brought parallel with the curve on the inside at the ends not greater than one-third the outside diameter of the pipe without showing cracks or flaws.

§ 66.35–15 Tension tests.

(a) Tension tests shall be made from every 50 pieces furnished, or fraction thereof, and shall show the following results:

(1) Tensile strength, not less than 48,000 pounds per square inch.

(2) Elongation in 8-inch specimen, not less than 12 percent.

§ 66.35–20 Marking.

(a) The name or brand of the manufacturer shall be legibly rolled in raised characters or stamped on the outer surface of each pipe.

§ 66.35–25 Finish.

(a) Pipe shall be free, inside and outside, from all surface defects that would materially weaken it or form starting points of corrosion. The defects to be especially avoided are snakes, checks, slivers, laps, pits, etc. Pipe shall be smooth and straight.

PART 67—CONSTRUCTION

Subpart 67.01—Procedure and General Requirements

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67.01–5 Drawings.
67.01–10 Computations.
67.01–15 Appeals.
67.01–20 Materials and workmanship.
67.01–25 Alternative materials or methods of repair.
67.01–30 Repairs, replacements, or alterations.
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AUTHORITY: The provisions of this Part 67 issued under R.S. 4405, as amended, 4462, as amended; 46 U.S.C. 375, 416. Interpret or apply R.S. 4399, as amended, 4400, as amended, 4417, as amended, 4417a, as amended, 4418, as amended, 4421, as amended, 4426–4431, as amended, 4433, as amended, 4434, as amended, 4453, as amended, 4488, as amended, 4491, as amended, sec. 14, 29 Stat. 690, as amended, sec. 10, 35 Stat. 428, as amended, 41 Stat. 305, as amended, secs. 1, 2, 49 Stat. 1544, 1545, as amended, sec. 17, 54 Stat. 166, as amended, sec. 3, 54 Stat. 347, as amended, sec. 3, 70 Stat. 152, sec. 3, 68 Stat. 675; 46 U.S.C. 361, 362, 391, 391a, 392, 399, 404–409, 411, 412, 435, 481, 489, 366, 395, 363, 367, 526p, 1333, 390b, 50 U.S.C. 198; E.O. 11239, July 31, 1965, 30 F.R. 9671, 3 CFR, 1965 Supp. Treasury Department Orders 120, July

31, 1950, 15 F.R. 6521; 167-14, Nov. 26, 1954, 19 F.R. 8026; 167-20, June 18, 1956, 21 F.R. 4894; CGFR 56-28, July 24, 1956, 21 F.R. 5659; 167-38, Oct. 26, 1959, 24 F.R. 8857.

Subpart 67.01—Procedure and General Requirements

§ 67.01-1 Definitions.

(a) *Main boiler.* A main boiler is a steam boiler used for generating steam for propulsion purposes on shipboard.

(b) *Auxiliary boiler.* An auxiliary boiler is a steam boiler used for all purposes on shipboard for which steam may be required other than propulsion.

(c) *Donkey boiler.* A donkey boiler is a steam boiler installed on a vessel for occasional use for any purpose for which steam is required other than propulsion.

(d) *Pressure vessel.* A pressure vessel is an unfired vessel containing gases, vapors, or liquids under pressure. (See Part 54 of Subchapter F (Marine Engineering) of this chapter.)

(e) *Water-tube boiler.* A water-tube boiler is a steam boiler in which the boiler tubes contain water and steam, the heat being applied to the outside surface of the tubes and is composed generally of drums, headers, and tubes.

(f) *Internally-fired fire-tube boiler.* (Scotch) An internally-fired fire-tube boiler is a steam boiler containing furnaces, one or more combustion chambers and tubes or flues which are surrounded by water and through which the products of combustion pass from the furnace to the uptake. In such boilers no part of the shell is in contact with the fire or products of combustion.

(g) *Externally-fired fire-tube or flue boilers.* (Horizontal return tubular) An externally fired and fire-tube or flue boiler is a steam boiler, part of the outer shell of which is exposed to fire or to the products of combustion, and containing flues through which such products pass from the furnace to the uptake.

(h) *Porcupine boiler.* A porcupine boiler is a steam boiler consisting of a vertical shell from which project a number of dead end tubes.

(i) *Factor of safety.* Factor of safety is the ratio of the ultimate strength of the material to the stress maximum allowable.

(j) *Pressure of p. s. i.* Pressure of p. s. i. is the gage pressure or the pressure above the atmospheric pressure in pounds per square inch.

(k) *Design pressure.* Design pressure is the theoretical bursting pressure of the weakest part of a boiler, pressure vessel, or piping divided by its factor of safety.

(l) *Maximum allowable pressure.* The maximum allowable pressure of a boiler and superheater shall be considered as the highest setting of the safety valves.

(m) *Repair.* Repair is the restoration of any damaged or impaired part to an effective and safe condition.

(n) *Alteration.* Alteration is a structural modification of or departure from an approved design or existing construction.

§ 67.01-5 Drawings.

(a) The manufacturer of any boiler to be used for marine purposes shall furnish the Officer in Charge, Marine Inspection, where such boiler or boilers are to be inspected duplicate blueprints or tracings fully descriptive of same in detail for his approval, one of which shall be kept on file in the inspection office and the other returned to the manufacturer. Where more than one boiler is made from a similar design, a drawing of which is on file in the inspection office, if made at a different date, a reference to such drawing on file is all that shall be required. The manufacturer shall also furnish the Officer in Charge, Marine Inspection, an affidavit on either Form CG-935 or CG-936.

(b) Duplicate blueprints or drawings of water-tube and coil boilers, with their specifications, shall be submitted for approval of the Commandant (under R. S. 4429, 46 U. S. C. 407), and the design approved by the Commandant, before the boilers will be allowed to be used on any vessel coming under the jurisdiction of the Coast Guard. After the approval of the design by the Commandant, 60 certified sets of the blueprints or drawings shall be furnished the Commandant for the use of the inspectors. The blueprints or drawings necessary to comply with the foregoing provisions shall be supplied by the manufacturers. Manufacturers shall furnish Officers in Charge, Marine Inspection, where boilers are to be installed an affidavit certifying that the boilers are constructed in accordance with the specification approved by the Commandant.

(c) Contractors intending to repair boilers, unfired pressure vessels or appliances installed on vessels subject to inspection by the Coast Guard, shall submit detail drawings in triplicate which shall be fully descriptive of the repair parts of such boilers, unfired pressure vessels, or appliances, to the Officer in Charge, Marine Inspection, having jurisdiction over the vessel. When due to location of the shipyard or design office, such a procedure would result in unnecessary delay in transmission, the drawings may be forwarded directly to the Commandant (MMT), U.S. Coast Guard, Washington, D.C., 20226.

§ 67.01-10 Computations.

It shall be the duty of every Officer in Charge, Marine Inspection, to make, for every new boiler inspected in his district, all computations required by the rules and regulations, and any other necessary computations, from data obtained from blueprints or tracings, boiler manufacturers' affidavits, tensile test reports, and from other reliable sources. A record of such computations in full shall be made on letter sheets and filed with blueprints or tracings of boiler, the first sheet of such computations to be headed with a general description of boiler and with the vessel file number.

§ 67.01-15 Appeals.

In case the repair is disapproved by the Officer in Charge, Marine Inspection, the manufacturer may appeal within 30 days to the Coast Guard District Commander of the district, and should the Coast Guard District Commander sustain the Officer in Charge, Marine Inspection, the manufacturer may further appeal within 30 days to the Commandant. The decision of the Commandant shall be final.

§ 67.01-20 Materials and workmanship.

All materials to be used for repairs, replacements and for alterations shall be free from injurious defects and shall have a workmanlike finish. The work shall be executed in a workmanlike manner with proper tools or equipment and shall be free from defects which would impair strength or durability.

§ 67.01-25 Alternative materials or methods of repair.

If, in the development of industrial arts, improved materials or methods of repair are developed, their use in lieu of those specified will be given consideration upon formal application to the Commandant, with full information as to their characteristics, together with such scientific data and evidence as may be necessary to establish the suitability of such materials or methods of repair for the purpose intended.

§ 67.01-30 Repairs, replacements, or alterations.

(a) No repairs, replacements, or alterations, except emergency repairs, etc., shall be made to boilers, pressure vessels, their mountings or internal fittings, safety valves, piping systems, or pressure appliances without prior approval by the Officer in Charge, Marine Inspection.

(b) Boilers built and installed prior to July 1, 1935, may be repaired with materials and in the same manner specified in this subchapter, except that the use of cast iron valves, mountings, or attachments for repairs, replacements, or alterations on existing boilers operating at pressures exceeding 30 pounds per square inch is prohibited. Emergency repairs, replacements, or alterations shall be reported as soon as practicable to the Officer in Charge, Marine Inspection, at or nearest the first port where the vessel may call after such repairs are made.

§ 67.01-35 Boilers built since February 28, 1872.

Boilers built since February 28, 1872, of material stamped and tested according to the requirements of R.S. 4430 (46 U.S.C. 408), and having a record thereof in the office of the Officer in Charge, Marine Inspection, in the district where the boiler was built or intended to be used, may be used for marine purposes, notwithstanding that such boilers may have been used for other purposes, if in the judgment of the Officer in Charge, Marine Inspection, they are deemed safe.

§ 67.01-40 Inspectors' decisions.

When it becomes necessary for inspectors to make decisions on certain matters covered by the regulations in this subchapter, they shall in making their reports quote the section and paragraph

number on which their decisions are based. Whenever it is necessary to make decisions in matters not specifically covered by the regulations in this subchapter, they shall in making their reports state clearly the reasons which caused them to arrive at such decisions.

Subpart 67.05—Cylindrical Shells

§ 67.05–1 Definitions.

(a) *Cylindrical shell.* The term "cylindrical shell," as used in this subchapter means the cylinder forming the outer envelope of a boiler or other pressure vessel, or of a drum which is a part of a boiler consisting of one or more plates properly riveted, welded, or otherwise joined or of seamless construction as hereinafter specified.

(b) *Course.* A course is a section of a cylindrical shell which comes between circumferential joints.

§ 67.05–5 Materials.

(a) Plates shall be of boiler steel complying with Subpart 66.10 of this subchapter.

(b) Seamless steel pipe or tubing made by the open-hearth process may be used for shells in the construction of steam and water drums for boilers when the inside diameter of such drums does not exceed 24 inches, provided that the material conforms to the requirements of Subpart 66.35 of this subchapter.

(c) Welded steel pipe of material made by the open-hearth process may be used in the construction of drum shells, provided that the joints are made by the hammer-weld process and the material conforms to the requirements of Subpart 66.30 of this subchapter.

(d) Welded wrought-iron pipe may be used in the construction of drum shells, provided the joints are made by the hammer-weld process and the material conforms to the requirements of Subpart 66.30 of this subchapter.

(e) Copper or brass may be used in the construction of steam drums not exceeding 14 inches in diameter, of a thickness of material not less than five-eighths of an inch, and on the construction of steam drums 12 inches in diameter and under having a thickness of material of not less than ½ inch. All tubes and drums referred to in this paragraph shall be made from ingots or blanks drawn down to size without a seam. Water-tube boilers or generators so constructed may be used for marine purposes with none other than liquid fuel.

(f) Manufacturers furnishing steel piping or tubing for the construction of steam or water drums shall submit a certification that the material furnished conforms to the physical requirements specified in Subpart 66.35 of this subchapter.

§ 67.05–10 Computations.

(a) *Riveted cylindrical shells.* (1) The maximum allowable pressure on cylindrical shells of boilers constructed of plates inspected as required by this subchapter when single riveted, shall not produce a stress to exceed one-sixth of the tensile strength of the iron or steel plates of which such boilers are constructed; but where the longitudinal laps of the cylindrical parts of such boilers are double riveted, and the rivet holes for such boilers have been fairly drilled instead of punched, an addition of 20 percent to the maximum allowable pressure provided for single riveting shall be allowed.

(2) The maximum allowable pressure for any dimension of boilers shall be ascertained by the following rule, viz: Multiply one-sixth of the lowest tensile strength found stamped on the plates in the cylindrical shell by the thickness, expressed in inches or parts of an inch, and divide by the radius or half diameter, also expressed in inches; and the result will be the pressure allowable per square inch of surface for single riveting, to which add 20 percent where the longitudinal laps of the cylindrical parts of such boiler are double riveted, when all the rivet holes of such boiler, including steam and mud drums, have been fairly drilled and no part of such holes has been punched. The pressure allowed shall be based on the plate whose tensile strength multiplied by its thickness gives the lowest product.

(b) *Seamless or welded drums.* (1) The maximum allowable working pressure and minimum thickness of seamless or welded drums shall be computed from the following formulas:

$$P=\frac{S\times T\times E}{R\times F} \qquad (1)$$

$$T=\frac{P\times R\times F}{S\times E} \qquad (2)$$

where:

P = maximum allowable working pressure, in pounds per square inch.
T = thickness of shell in inches.
S = minimum tensile strength of material in pounds per square inch.
R = inside radius of shell in inches.
F = factor of safety, which is 6.
E = efficiency of join or ligament between tube holes, whichever is the least.

(2) Where seamless piping or tubing is used, the value of E shall equal 1, except in cases where the shell is pierced for tube holes, in which case the value of E shall equal the percentage of strength of the ligament between the tube holes as compared with the solid plate.

(3) Where reinforcing plates are used to strengthen the shell at the point where the tube enters, they shall be riveted to the shell and the value of E shall be determined in the following manner:

(i) The efficiency of the plate section or ligament between tube holes, or

(ii) The shearing strength of the rivets securing the plate to the shell, whichever value is the least.

(4) Where welded piping is used for drum shells as specified in preceding paragraphs, the value of E shall be taken at 0.7, except where the shell is pierced for tube holes and the strength of the ligament falls below 70 percent, in which case the value of E shall be the percentage of strength of the ligament between the tube holes as compared with the solid plate.

(5) Where reinforcing plates are used to strengthen the shell of such welded drums at the point where the tube enters, and the efficiency of the ligament between tube holes or the shearing strength of the rivets securing the reinforcing plate to the shell falls below 70 percent of the strength of the solid plate, the value of E shall be determined in the following manner:

(i) The efficiency of the plate section or ligament between tube holes, or

(ii) The shearing strength of the rivets securing the plate to the shell, whichever value is the least.

(c) *Water-tube or coil boilers.* (1) The maximum allowable pressure on cylindrical shells of water-tube or coil boilers, when such shells have a row or rows of pipes or tubes inserted therein, shall be determined by the following formula: *Provided,* That the pressure allowable on such shells shall also be determined by the rule for cylindrical shells of boilers constructed of inspected plates conforming to Subpart 66.10 of this subchapter, and the lower pressure allowable by the two rules shall be taken:

$$P=\frac{(D-d)\times T\times S}{D\times R} \qquad (3)$$

where:

P = maximum allowable pressure, in pounds per square inch.
D = distance between the tube or pipe centers in a line from head to head, in inches.
d = diameter of hole, in inches.
T = thickness of plate, in inches.
S = one-fourth of the tensile strength of the plate, in pounds per square inch.
R = radius of shell, in inches.
n = number of tube holes in a pitch.

(2) When tubes on any one row are pitched unequally, nd must be substituted in the formula (3) for d.

(3) Where rows of tubes are pitched diagonally, each diagonal ligament shall not be less than three-fifths of each longitudinal ligament.

(d) *Porcupine-type Boilers.* (1) The formula for determining the maximum allowable pressure on boilers of the so-called porcupine and similar types shall be in accordance with this paragraph.

(2) Multiply the vertical distance between the centers of the horizontal rows of tubes in inches by one-half the diameter of shell of boiler in inches, which gives the area upon which the pressure is exerted to break a diagonal ligament, then find the sectional area of the ligament at its smallest part and multiply by one-sixth the tensile strength of the material. This result divided by the area upon which the strain is exerted gives the maximum allowable pressure as follows:

$$P=\frac{STE}{CD} \qquad (4)$$

where:

P = maximum allowable pressures, in pounds per square inch.
E = width of the ligament, in inches.
T = thickness of the material, in inches.
S = one-sixth of the tensile strength, in pounds per square inch.
C = distance between vertical centers, in inches.
D = one-half the inside diameter of the shell of central column, in inches.

Subpart 67.10—Shell Joints

§ 67.10–1 Approved types of joints.

(a) Joints of shells of boilers or other pressure vessels are classified as follows:

(1) Riveted joints, which may be either lapped or butt-strapped.

(2) Welded joints, which shall be made by the hammer-weld or other approved process.

§ 67.10–5 Workmanship.

(a) Centers or guide holes not to exceed 75 percent of the diameter of the full-size finished hole for tubes and stays may be punched. The remainder shall be cleanly cut, drilled, or reamed to full size. Holes not to exceed 4 inches in diameter in plates five-eighths of an inch thick and under may be punched to within ½ inch of the full diameter of the finished hole; the remainder shall be cleanly cut, drilled, or reamed to full size.

§ 67.10–10 Riveted joints.

(a) The diameter of rivets, rivet holes, distance between centers of rivets, and distance from centers of rivets to edge of lap for different thicknesses of plates for single and double riveting shall be determined by the rules in this section.

(b) The formulas in this section, equivalent to those of the British Board of Trade, are given for the determination of the pitch, distance between rows of rivets, diagonal pitch, maximum pitch, and distance from centers of rivets to edge of lap of single and double riveted lap joints, for both iron and steel boilers.

(c) (1) To determine the pitch for iron plates and iron rivets:

$$p=\frac{d^2\times 0.7854\ X\ n}{T}+d \qquad (1)$$

(2) To determine the pitch for steel plates and steel rivets:

$$p=\frac{28\times d^2\times 0.7854\ X\ n}{28\times T}+d \qquad (1a)$$

(d) To determine the distance from center of rivet to edge of lap:

$$E=\frac{3\times d}{2} \qquad (2)$$

(e) To determine the distance between rows of rivets:

(1) The distance between lines of centers of rows of rivets for double, chain-riveted joints (V) shall not be less than twice the diameter of rivet, but it is more desirable that V should not be less than:

$$\frac{4d+1}{2} \qquad (3)$$

(2) For ordinary, double zigzag riveted joints:

$$V=\frac{\sqrt{(11p+4d)\ (p+4d)}}{10} \qquad (4)$$

(f) To determine the diagonal pitch for double, zigzag riveted lap joint; iron and steel:

$$p_d=\frac{6p+4d}{10} \qquad (5)$$

(g) To determine the maximum pitches for riveted lap joints:

(1) For single-riveted lap joints:

$$\text{Maximum pitch}=(1.31\times T)+1\tfrac{5}{8} \qquad (6)$$

(2) For double-riveted lap joints:

$$\text{Maximum pitch}=(2.62\times T)+1\tfrac{5}{8} \qquad (7)$$

where:

p = greatest pitch of rivets, in inches.
n = number of rivets in one pitch.
p_d = diagonal pitch, in inches.
d = diameter of rivets, in inches.
T = thickness of plate, in inches.
V = distance between rows of rivets, in inches.
E = distance from edge of plate to center of rivet, in inches.

(h) To determine the pitch of rivets from the formulas in this section, use the diameter and area of the rivet holes. The diameter of the rivets is the diameter of the driven rivet.

(i) Any riveted joint shall be allowed when it is constructed so as to give an equal percentage of strength to that obtained by the use of the formula given.

§ 67.10–15 Butt straps.

(a) Where butt straps are used in the construction of marine boilers, the straps for single butt strapping shall in no case be less than the thickness of the shell plates; and where double butt straps are used, the thickness of each shall in no case be less than five-eighths the thickness of the shell plates.

§ 67.10–20 Welded joints.

(a) Where welded drums are used, the joint shall be so located as not to be in contact with the products of combustion, and shall not be pierced for tube holes.

Subpart 67.15—Heads

§ 67.15–1 Definitions.

(a) *Unstayed heads.* Unstayed heads are the ends of a pressure vessel shell. They may be either flat or dished. Heads may be integral with, riveted, welded, or brazed to the shell.

(b) *Unstayed flat heads.* Unstayed flat heads may be used to close shells as permitted by the regulations in this subchapter.

(c) *Dished heads.* Dished heads may be of circular or elliptical section and may be attached to the shell so that the pressure will be either on the concave or on the convex surface.

(d) *Stayed heads.* Stayed heads are heads supported in whole or in part by stays, furnaces, flues, tubes, etc.

§ 67.15–5 Materials and workmanship.

(a) Material used in the construction of all bumped heads shall possess the physical and chemical qualities prescribed by the Commandant for all plates subject to tensile strain, as required by R.S. 4430 (46 U.S.C. 408).

(b) To avoid grooving the flanging shall be well rounded at the bend.

(c) Bumped heads may contain a manhole opening flanged inwardly, when such flange is turned to a depth of three times the thickness of material in the head.

(d) All drums attached to coil, pipe, sectional, or water-tube boilers not already in use or actually contracted for, to be built for use on a steam vessel, and their building commenced at or before the date of this rule, shall be required to have the heads of wrought iron or steel or cast steel flanged and substantially riveted to the drums or secured by bolts and nuts of equal strength with rivets, in all cases where the diameters of such drums exceed 6 inches.

(e) Drums and water cylinders constructed with a bumped head at each or either end, any opening in the shell or heads to be reinforced as required by the rules of the Commandant, the circumferential and horizontal seams to be welded and properly annealed after such welding is completed, and when tested with a hydrostatic pressure of at least double the amount of the steam pressure allowed may be used for marine purposes.

§ 67.15–10 Computations.

(a) *Convex heads.* All plates used as heads, when new and made to practically true circles, and as described below, shall be allowed a maximum pressure in accordance with the following formula:

$$P=\frac{T\times S}{R} \qquad (1)$$

where:

P = Maximum allowable pressure, in pounds per square inch.
T = thickness of plate, in inches.
S = one-fifth of the tensile strength, in pounds per square inch.
R = one-half of the radius to which the head is bumped, in inches.

(b) *Concave heads.* For concave heads the pressure allowable shall be eight-tenths times the pressure allowable for convex heads.

NOTE: To find the radius of a sphere of which the bumped head forms a part, square the radius of head, divide this by the height of bump required; to the result add height of bump, which will equal diameter of sphere, one-half of which will be the required radius.

(c) *Flat heads of wrought-iron or steel plate.* (1) Where flat heads do not exceed 20 inches in diameter they may be used without being stayed, and the maximum pressure allowable shall be determined by the following formula: *Provided,* That flanges are made to an inside radius of at least 1½ inches:

$$P=\frac{C\times T^2}{A} \qquad (2)$$

where:

P = maximum allowable pressure, in pounds per square inch.
T = thickness of material in sixteenths of an inch.
A = one-half the area of head, in square inches.
C = 112 for plates seven-sixteenths of an inch and under.
C = 120 for plates over seven-sixteenths of an inch.

(d) *Requirements for heads (applicable only to rivers).* (1) All heads employed in the construction of cylindrical externally fired boilers for steamers navigating the Red River of the North and rivers whose waters flow into the Gulf of Mexico shall have a thickness of material as follows:

(i) Over 32 inches and not over 36 inches, not less than ½ inch.

(ii) Over 36 inches and not over 40 inches, not less than 9/16 inch.

(iii) Over 40 inches and not over 48 inches, not less than 5/8 inch.

(iv) Over 48 inches, not less than 3/4 inch.

(2) The heads of steam and mud drums of such boilers shall have a thickness of material of not less than half an inch.

Subpart 67.20—Openings and Reinforcements

§ 67.20–1 Material.

(a) The cover plates for manholes and handholes should be of steel conforming to the specifications and requirements for steel plates.

(b) Cast steel may also be used in the construction of manhole and handhole plates.

§ 67.20–5 Manhole openings.

(a) Manhole openings in front head of externally fired boilers under the flues, as required by R.S. 4434 (46 U.S.C. 412), shall be of dimensions of not less than 8 by 12 inches in the clear. Applicable to steamers navigating rivers only.

(b) All boilers built on and after August 1, 1914, shall have a manhole opening above the flues or tubes of not less than 10 by 16 inches, 11 by 15 inches, or of an equal area, in the clear, and shall have such other manhole openings in other parts of the boiler as may be required by the Officer in Charge, Marine Inspection, when considering blueprints or tracings submitted to him for approval of sufficient dimensions to allow easy access to the interior of the boiler for the purpose of inspection and examination.

§ 67.20–10 Reinforced openings.

(a) When holes exceeding 6 inches in diameter are cut in boilers for pipe connections, manhole and handhole plates, such holes shall be reinforced, either on the inside or outside of boiler, with reinforcing wrought-iron steel rings, which shall be securely riveted or properly fastened to the boiler, such reinforcing material to be rings of sufficient width and thickness of material to fully compensate for the amount of material cut from such boilers, in flat surfaces; and where such opening is made in the circumferential plates of such boilers, the reinforcing ring shall have a sectional area equal to at least one-half of the sectional area of the opening parallel with the longitudinal seams of such portion of the boiler. On boilers carrying 75 pounds or less steam pressure a cast-iron stop valve, properly flanged, may be used as reinforcement to such opening. When holes are cut in any flat surface of such boilers and such holes are flanged inwardly to a depth of not less than 1½ inches, measuring from the outer surface, the reinforcement rings may be dispensed with.

(b) When reinforcing rings as described above are made of wrought-iron or steel, the material shall not be required to be tested.

(c) Seamless forged steel nozzles may be used for reinforcing holes cut in boilers when the amount of material in the flange of the saddle that is secured to the boiler is equal to the amount of material removed from the boiler.

(d) No connection between shell of boiler and mud drum shall exceed 9 inches in diameter and the flange of the mud-drum leg shall consist of an equal amount of material to that cut out of the shell of boiler.

Subpart 67.25—Stays and Stayed Surfaces

§ 67.25–1 Definitions.

(a) *Through stay.* Through stay is a solid bar extended through both heads of a boiler and threaded at the ends for attachment by means of nuts. With this type of stay the ends are usually upset to compensate for the threading. (See Figure 67.25–1(a).)

(b) *Solid staybolt.* Solid staybolt is a threaded bar screwed through the plates, the ends being riveted over or fitted with nuts or welded collars. (See Figure 67.25–1 (b).)

(c) *Hollow staybolt.* Hollow staybolt is a hollow threaded bar screwed through the plates, the ends being riveted over or fitted with nuts or welded collars. (See Figure 67.25–1 (c).)

(d) *Flexible staybolt.* Flexible staybolt is a bar made with ball-and-socket joint on one end, the cup of the socket being screwed into the outside sheet and covered with a removable cap, the plain end of the staybolt being threaded, screwed through the inside sheet and riveted over. (See Figure 67.25–1 (d).)

(e) *Sling stay.* Sling stay is a flexible stay consisting of a solid bar having one or both ends forged for a pin connection to a crowfoot or other structural fitting secured to the stayed plate. (See Figure 67.25–1 (e).)

(f) *Crowfoot.* Crowfoot is a forged fitting with palms or lugs secured to the head to form a proper connection with a sling stay. (See Figure 67.25–1 (f).)

(g) *Crowfoot stay.* Crowfoot stay is a solid bar stay terminating in a forged fork with palms or lugs for attachment to the plate. (See Figure 67.25–1 (g).)

(h) *Diagonal stay.* Diagonal stay is a bar or formed plate forged with palms or lugs for staying the head of the boiler to the shell diagonally. (See Figure 67.25–1 (h).)

(i) *Gusset stay.* Gusset stay is a triangular plate used for the same purpose as a diagonal stay and attached to the head and the shell by angles, flanges, or other suitable means of attachment. (See Figure 67.25–1 (i).)

(j) *Dog stay.* Dog stay is a staybolt, one end of which extends through a girder, dog, or bridge, and is secured by a nut, the other end being screwed through the plate which it is supporting and riveted over or fitted with a nut or welded collar. (See Figure 67.25–1 (j).)

(k) *Girder.* Girder is a bridge, built up of plates or structural shapes separated by distance pieces, a forging, of a formed plate, which spans an area requiring support abutting thereon and supporting the girder stays or staybolts. (See Figure 67.25–1 (k).)

(l) *Welded collar.* Welded collar is a beveled ring formed around the end of a screw stay by means of arc or gas welding. It is used in lieu of a nut. (See Figure 67.25–1 (l).)

(m) *Reinforcement.* Reinforcement is a doubling plate, washer, structural shape, or other form for stiffening or strengthening a plate.

(n) *Stay tube.* Stay tube is a thick-walled tube used in fire-tube boilers to stay the tube sheets.

(o) *Telltale hole.* Telltale hole is a small hole having a diameter not less than 5/16 inch drilled in the center of a solid stay and extending to at least ½ inch beyond the inside surface of the sheet.

(p) *Stayed surfaces.* Surfaces to be stayed or reinforced include the following:

(1) Flat plates, heads, or areas thereof, such as segments of heads, wrapper sheets, furnace plates, side sheets, combustion chamber tops, etc., which are not self-supporting.

(2) Curved plates constituting the whole or parts of a cylinder subject to external pressure which are not entirely self-supporting.

§ 67.25–5 Materials and workmanship.

(a) All steel bars to be used as stays or braces in marine boilers and allowed a stress of 7,000, 8,000, or 9,000 pounds per square inch shall be tested by inspectors at the mills where the material is manufactured in compliance with Subpart 66.15 of this subchapter.

(b) Stay bolts and stays made of the best quality of refined wrought iron may be welded. The lengthening of steel stays by welding shall not be allowed.

(c) All screw stay bolts shall be drilled at the ends with a three-sixteenths-inch hole to at least a depth of one-half inch beyond the inside surface of the sheet. Stays through laps or butt straps may be drilled with larger hole to a depth so that the inner end of said larger hole shall not be nearer than the thickness of the boiler plates from the inner surface of the boiler. Hollow-rolled screw stay bolts may be used.

(d) Flexible stay bolts that are made with a ball in socket on one end, the socket screwed into the outside sheet and covered with a removable cap and bolt screwed into the inside sheet and riveted over, may be used for staying flat surfaces without being drilled with a telltale hole.

(e) Holes for screw stays shall be tapped fair and true, and full thread.

(f) The ends of stays which are upset to include the depth of thread shall be thoroughly annealed after being upset.

§ 67.25–10 Stays.

(a) The maximum allowable pressure for stays used in the construction of marine boilers where same are accurately fitted normal to supported surfaces and

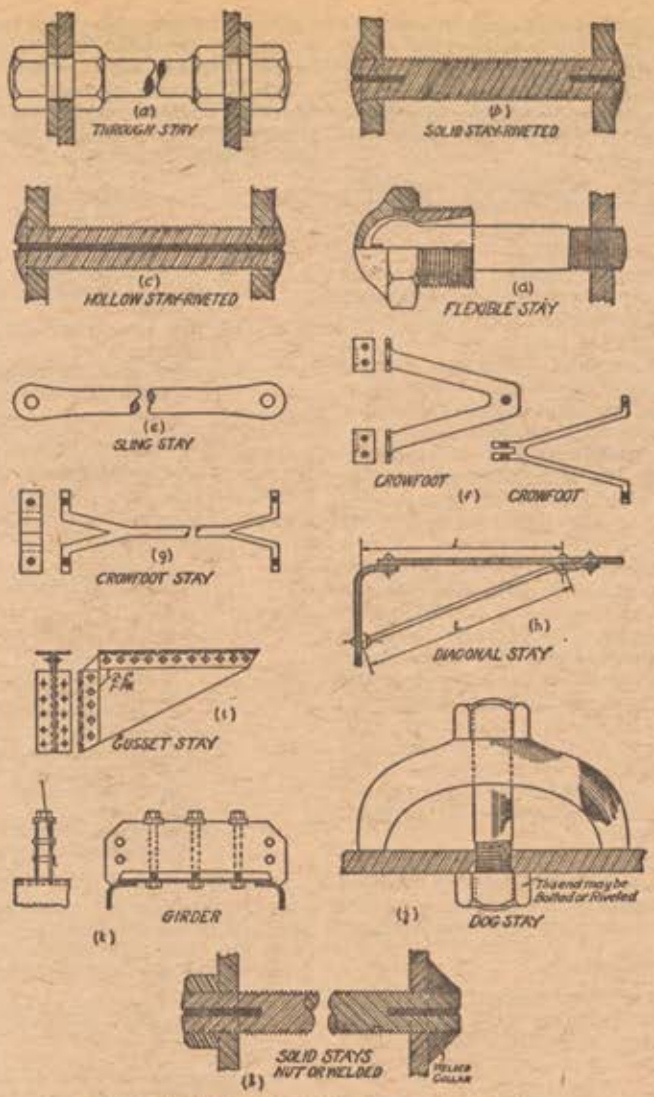


FIGURE 67.25-1—Acceptable types of boiler stays.

properly secured shall be ascertained by the following formula:

$$P=\frac{A\times C}{a} \qquad (1)$$

where:

P=maximum allowable pressure, in pounds per square inches.
A=least cross-sectional area of stay, in square inches.
a=area of surface supported by one stay, in square inches.
C=a constant.
C=9,000 for tested steel stays 1 inch and upward in diameter when such stays are not forged or welded. The ends may be upset to a sufficient diameter to allow for the depth of the thread. The diameter shall be taken at the bottom of the thread, provided it is the least diameter of the stay. All such stays after being upset shall be thoroughly annealed.
C=8,000 for a tested Huston or similar type of brace, the cross-sectional area of which exceeds 5 square inches.
C=7,000 for such tested braces when the cross-sectional area is not less than 1.227 and not more than 5 square inches, provided such braces are prepared at one heat from a solid piece of plate without welds.
C=7,500 for wrought-iron stays 1 inch and upward in diameter when made of the best quality of refined iron. The ends may be upset to allow for the depth of the thread. The diameter shall be taken at the bottom of the thread, provided it is the least diameter of the stay. Such stays may be welded.
C=6,000 for welded crowfoot stays when made of best quality of refined wrought-iron, and for all stays not otherwise provided for when made of the best quality of refined iron or of steel without welds.

(b) The required cross-sectional area of a diagonal or gusset stay shall be determined by the following formula:

$$A=\frac{a\times L}{l} \qquad (2)$$

where:

A=sectional area of diagonal stay, in square inches.
a=sectional area of direct stay, in square inches.
L=length of diagonal stay, in inches.
l=length of line drawn at right angles to boiler head or surface supported to center of palm of diagonal stay, in inches.

(c) When sling stays are connected by pins to angles secured to shell (see Figures 67.30-10(d) (1) and (2)), said angles shall be of sufficient depth to resist shear. Section to resist shear shall be determined by the following formulas:

$$A=D\times 2T \qquad (3)$$

$$D=\frac{A}{2T} \qquad (4)$$

where:

A=sectional area of pin, in square inches.
D=depth from edge of pinhole to end of leg in inches.
$2T$=thickness of two angles, in inches.

(d) Minimum diameter of rivets shall be found as follows:

Minimum diameter=

$$\sqrt{\frac{\text{load}}{0.7854\times 12{,}000\times N}} \qquad (5)$$

where:

N=number of rivets. Rivets shall be staggered in each leaf.

(e) The sectional area of gusset stays, when constructed of triangular right-handed web plates secured to single or double angle bars along the two sides at right angles, shall be determined by formula for diagonal stays, and shall be not less than 10 percent greater than would be necessary for a diagonal bolt stay.

(f) The diameter of a screw stay shall be taken at the bottom of the thread, provided it is the least diameter of the stay.

(g) For all stays the least sectional area shall be taken in calculating the stress allowable.

(h) The sectional area of pins to resist double shear and bending, accurately fitted and secured in crowfeet, sling, and similar stays, shall be at least equal to eight-tenths of the required sectional area of the brace. Breadth across each side and depth to crown of eye shall be not less than 0.35 of diameter of pin. In order to compensate for inaccurate distribution the forks shall be proportioned to support two-thirds of the load, thickness of forks to be not less than 0.66 of the diameter of pin.

(i) The combined sectional area of rivets used in securing tee irons and crowfeet to shell, said rivets being in tension, shall be not less than the required sectional area of brace. To insure a well-proportioned rivet point, rivets shall be of sufficient length to completely fill the rivet holes and form a head equal in strength to the body of the rivet. All rivet holes shall be drilled. Distance from center of rivet hole to edge of tee irons, crowfeet, and similar fastenings shall be so proportioned that the net sectional areas through sides at rivet holes shall equal the required rivet section. Rivet holes shall be slightly countersunk in order to form a fillet at point and head.

§ 67.25–15 Stayed surfaces.

(a) All stayed surfaces formed to a curve the radius of which is over 21 inches, excepting surfaces otherwise provided for, shall be deemed flat surfaces.

(b) (1) The maximum allowable pressure on flat plates supported by stays shall be determined by the following formula:

$$P=\frac{C\times T^2}{p^2} \qquad (1)$$

(2) When pitches of stays are unequal, $\frac{A^2+B^2}{2}$ is to be taken instead of p^2.

where:

P=maximum allowable pressure, in pounds per square inch.
p=pitch of stays when equal space in both directions, in inches.
B=distance between two rows of stays, in inches.
T=thickness of plates in sixteenths of an inch.
C=112 for screw stays with riveted heads, plates 7/16 inch thick and under.
C=120 for screw stays with riveted heads, plates above 7/16 inch thick.
C=120 for screw stays with nuts, plates 7/16 inch thick and under.
C=125 for screw stays with nuts, plates 7/16 inch thick and under 9/16 inch.
C=135 for screw stays with nuts, plates, 9/16 inch thick and above.
C=160 for stays with washers or doubling strips which have a thickness of at least 0.5 of the thickness of the plate and a diameter of at least 0.5 of the greatest pitch of the stay, riveted to the outside of the plates, and stays having one nut inside of the plate and one nut outside of the washer or doubling strip. For T take 72 percent of the combined thickness of the plate and washer or plate and doubling strip.
C=175 for stays with double nuts, having one nut on the inside and one nut on the outside of the plate, without washers or doubling plates.
C=200 for stays fitted with doubling plates which have a thickness equal to at least 0.5 of the thickness of the plate reinforced, and covering the full area braced (up to the curvature of the flange, if any), riveted to either the inside or outside of the plate, and stays having one nut outside and one inside of the plates. Washers or doubling plates to be substantially riveted. For T take 72 percent of the combined thickness of the two plates.
C=200 for stays with plates stiffened with tees or angle bars having a thickness of at least two-thirds the thickness of plate and depth of webs at least one-fourth of the greatest pitch of the stays, and substantially riveted on the inside of the plates, and stays having one nut inside bearing on washers fitted to the edges of the webs that are at right angles to the plate. For T take 72 percent of the combined thickness of web and plate.

Subpart 67.30—Combustion Chambers and Tube Sheets of Fire-Tube Boilers

§ 67.30–1 Definitions.

(a) *Combustion chamber.* Combustion chamber, within the meaning of this section, is that part of an internally-fired boiler in which combustible gases may be burned after leaving the furnace.

(b) *Separate combustion chamber.* Separate combustion chamber is a combustion chamber which is connected to one furnace only.

(c) *Common combustion chamber.* Common combustion chamber is a combustion chamber connected to two or more furnaces in a boiler.

(d) *Crown or top plate.* Crown or top plate is the top of a combustion chamber and is usually supported by girder stays or by sling stays or braces.

(e) *Wrapper sheet.* Wrapper sheet is the side plate of any type of combustion chamber and also the bottom plate of a common combustion chamber.

(f) *Curved bottom plate.* Curved bottom plate is the bottom of a separate combustion chamber formed to an arc of a circle and usually designed to be self-supporting.

(g) *Combustion chamber tube sheet.* Combustion chamber tube sheet is the plate, forming the end of a combustion chamber in which the tubes are secured.

(h) *Combustion chamber back sheet.* Combustion chamber back sheet is the plate opposite the tube sheet forming the back of the combustion chamber. It is usually stayed to the back head of the boiler by means of screw stays, or, in the case of double-ended boilers, to the back of the combustion chamber of the other end of the boiler.

(i) *Structural stiffeners.* Structural stiffeners are rolled shapes or flanged plates which are used to stiffen a surface which is not entirely self-supporting.

§ 67.30–5 Materials.

All plates forming parts of combustion chambers of fireboxes shall conform to the general specifications for the shell plates.

§ 67.30–10 Computations.

(a) *Curved bottom plate with reinforcement.* (1) Where rounded bottoms of combustion chambers are stiffened with single angle-iron stiffeners, such angles shall have a thickness of leaf eight-tenths that of the plate and a depth of at least one-half pitch. Where stiffened with double angle irons or tee bars, such angles or tee bars shall have a thickness of leaf at least two-thirds that of plate and a depth of at least one-fourth of pitch. Said angles or tee bars shall be substantially riveted to the plate supported. Where the bottom of combustion chambers are strengthened by angles or tee irons, the same shall be on the water side of the combustion chambers, as shown in in the sketches in this section.

(2) Where rounded tops of combustion chambers are stiffened with single or double angle-iron stiffeners or tee bars, such angles or tee bars shall be of thickness and depth of leaf not less than specified for rounded bottoms of combustion chambers. Said angles or tee bars shall be supported on thimbles and riveted through with rivets not less than 1 inch in diameter and spaced not to exceed 6 inches between centers.

(3) Maximum allowable pressure on rounded surfaces supported by angle-irons or tee bars shall be determined by the following formula:

$$P=\frac{900\times T^2}{p\times D} \qquad (1)$$

where:

P=maximum allowable pressure, in pounds per square inch.
T=thickness of plate in sixteenths of an inch.
p=pitch of angle or tee stiffeners, in inches.
D=diameter of curve to which plate is bent, in inches.

(b) *Curved bottom plate without reinforcement.* The maximum allowable pressure and the minimum thickness of round bottom of combustion chambers, angles being omitted, shall be computed by the following formulas:

$$P=\frac{50(300T-2L)}{D} \qquad (2)$$

$$T=\frac{P\times D+100L}{15{,}000} \qquad (3)$$

where:

P=maximum allowable pressure, in pounds per square inch.
T=thickness of bottom plate of combustion chamber, in inches.
L=extreme length of plate forming bottom of combustion chamber, in inches.
D=twice outside radius of bottom of combustion chamber, in inches.

(c) *Tube sheets.* (1) Maximum allowable pressure on tube sheets where combustion chambers are not suspended from the shell of the boiler shall be determined by the following formula:

$$P=\frac{(D-d)T\times 27{,}000}{W\times D} \qquad (4)$$

where:

P=maximum allowable pressure, in pounds per square inches.
D=least horizontal distance between tube centers, in inches.
d=inside diameter of tubes, in inches.
T=thickness of tube plate, in inches.
W=extreme width of combustion chamber, in inches.

(2) The compressive stress on tube plates, as determined by the following formula, shall not exceed 13,500 pounds per square inch, when pressure on top of combustion chamber is supported by vertical plates of such chamber.

$$S=\frac{P\times D\times W}{2(D-d)T} \qquad (5)$$

where:

S=compressive stress on tube sheet, in pounds per square inch.
P=maximum allowable pressure, in pounds per square inch.
D=least horizontal distance between tube centers, in inches.
d=inside diameter of tube, in inches.
W=extreme width of combustion chamber, in inches.
T=thickness of tube sheet, in inches.

(d) *Girders or crown bars.* (1) The maximum allowable pressure for girders or crown bars supporting the tops of

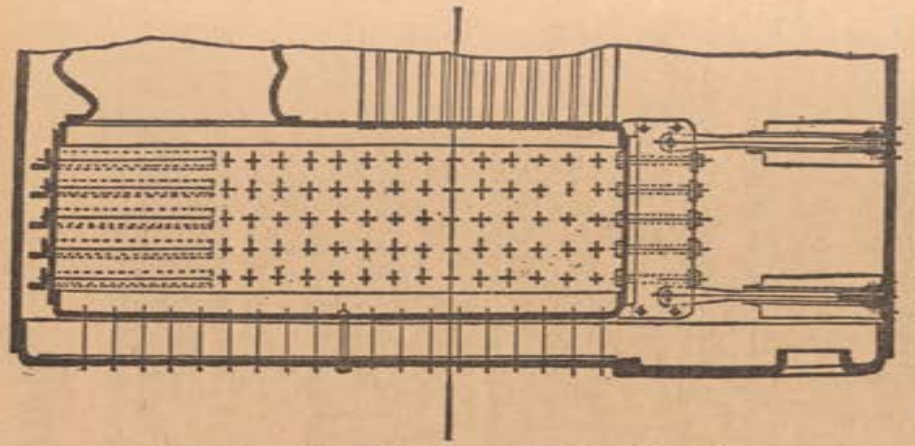


FIGURE 67.30-10 (d1)—Full load on tube sheet and backplate.

Diameter of hangers should be sufficient to carry the weight of combustion chamber and one-half the tubes and furnaces when no water is in boiler. No effect of buoyancy is considered.

These remarks are for separate combustion chambers when they are not secured to the shell at the bottom and therefore liable to bend the small screw stays.

In this case the tube sheet and backplate get the full compressive load in a similar manner to a boiler without hanging stays.

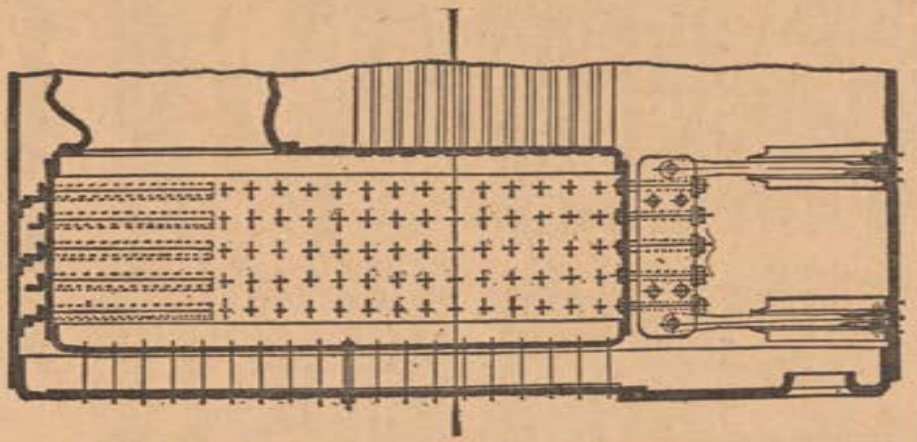


FIGURE 67.30-10 (d2)—Nearly whole compressive load taken off tube sheet.

Top hanging stays take full compressive load off tube sheet and backplate, except that half the load on unsupported portions marked B beyond stays will be taken by the tube sheet and backplate, respectively, and the other half by the last stays.

The thickness of tube sheet and backplate may be materially reduced from what would be required when tube sheet and backplate take full compressive load, providing that combustion chamber is well stayed to take full load at the bottom by screw stays or girders of plates and angles.

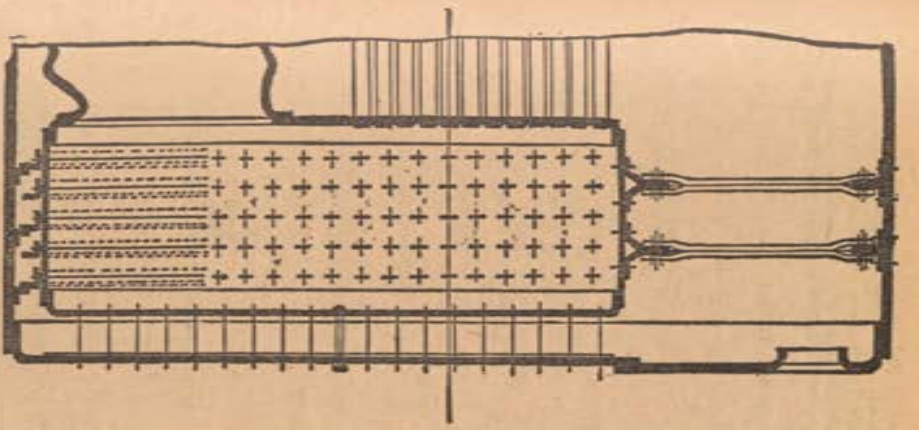


FIGURE 67.30-10 (d3)—Nearly whole compressive load taken off tube sheet.

Top hanging stays take full compressive load off tube sheet and backplate, except that half the load on unsupported portions marked B beyond stays will be taken by the tube sheet and backplate, respectively, and the other half by the last stays.

The bottom stays, whether of screw stays or girders of plates and angles, must be of the same sectional area as the top braces, and no boiler should be built having top stays as shown without having the bottom stays of equal strength.

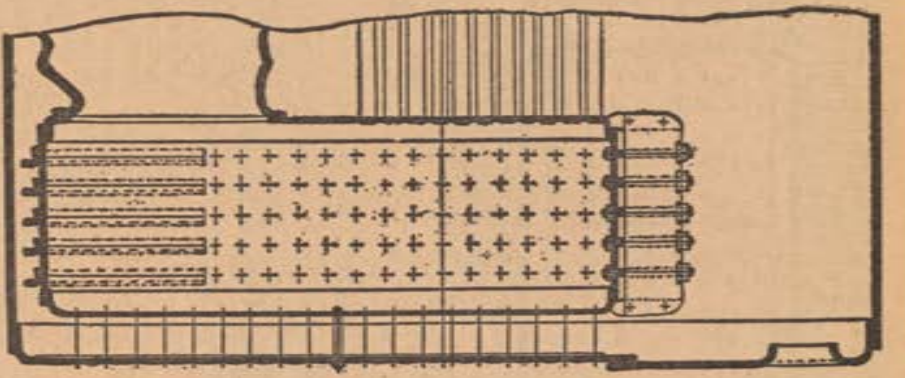


FIGURE 67.30-10 (d4)—Tube sheet and backplate get full load, and therefore should be heavy enough to withstand such.

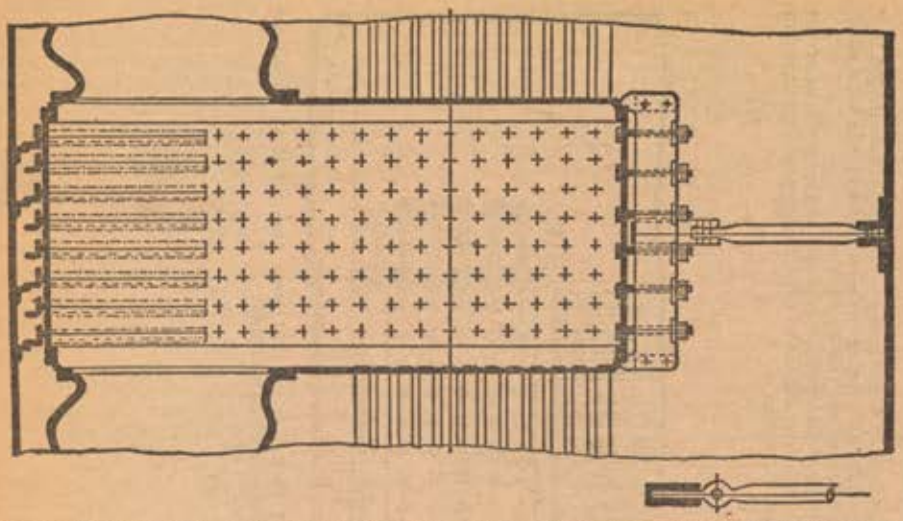


FIGURE 67.30-10 (d5)—Tube sheets each take part of compressive load, the hanging stays taking care of the other part.

The bottom stays, whether of screw stays or girders of plates and angles, must be of the same sectional area as the top braces.

In this case the thickness of the tube sheets may be materially reduced from what would be required when tube sheets together take full compressive load.

combustion chambers shall be determined by the following formula:

$$P=\frac{C\times d^2\times T}{(W-p)\times D\times L} \qquad (6)$$

where:

P = maximum allowable pressure, in pounds per square inch.
W = extreme width of combustion box, in inches.
p = pitch of supporting bolts, in inches.
D = distance between girders from center to center, in inches.
L = length of girder in feet between supports.
d = depth of girder, in inches.
T = thickness of girder, in inches.
C = 550 when the girder is fitted with 1 supporting bolt.
C = 825 when the girder is fitted with 2 or 3 supporting bolts.
C = 917 when the girder is fitted with 4 or 5 supporting bolts.
C = 963 when the girder is fitted with 6 or 7 supporting bolts.
C = 990 when the girder is fitted with 8 or more supporting bolts.

(2) Sling stays may be used in lieu of girders in all cases: *Provided, however,* That when such sling stays are used, girders or screw stays of the same sectional area shall be used for securing the bottom of combustion chamber to the boiler shell.

(3) When girders are dispensed with and the top and bottom of combustion chambers are secured by sling stays or braces, the sectional area of such stays shall conform with the requirements of § 67.25–10.

(4) The following drawings show an excellent practice of constructing combustion chambers with and without sling stays.

Subpart 67.35—Furnaces and Flues

§ 67.35–1 Definitions.

(a) *Furnace.* Furnace, within the meaning of this subpart, is a firebox or a large flue in which the fuel is burned.

(b) *Corrugated furnace.* Corrugated furnace is a cylindrical shell wherein corrugations are formed circumferentially for additional strength and to provide for expansion. (See Figures 67.35–1 (b1), 67.35–1 (b2), 67.35–1 (b3), 67.35–1 (b4), 67.35–1 (b5).)

(c) *Purves ribbed furnace.* Purves ribbed furnace is a cylindrical shell in which ribs or projections are formed circumferentially to provide additional strength. (See Figure 67.35–1 (c).)

(d) *Adamson ring furnace.* Adamson ring furnace is a cylindrical shell made in short sections, the ends of the sections being flanged and riveted together through a reinforcing ring. (See Figure 67.35–1 (d).)

(e) *Plain furnace.* Plain furnace is a cylindrical shell usually made in sections united by means of riveted joints. (See Figure 67.35–1 (e).)

(f) *Flues.* Flues are cylindrical shells made of seamless or welded tubing, or with a riveted longitudinal joint, the ends being attached by rivets. Their purpose is to provide additional heating surface and to form a path for the products of combustion. (See Figure 67.35–1 (e).)

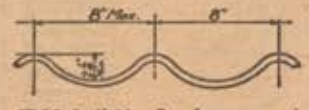


FIGURE 67.35–1 (b1)—Leeds suspension bulb furnace.

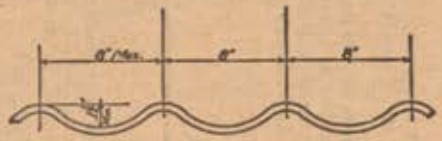


FIGURE 67.35–1 (b2)—Morison furnace.

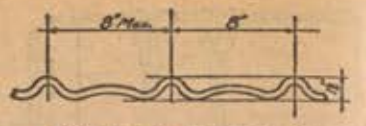


FIGURE 67.35–1 (b3)—Deighton furnace.



FIGURE 67.35–1 (b4)—Fox furnace.

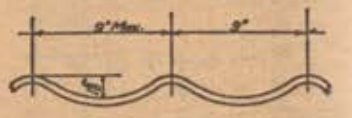


FIGURE 67.35–1 (b5)—Brown furnace.

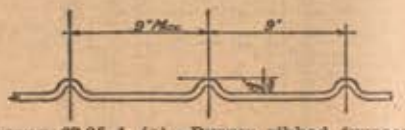


FIGURE 67.35–1 (c)—Purves ribbed furnace.

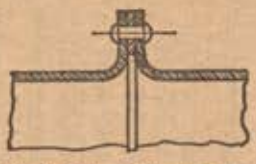


FIGURE 67.35–1 (d)—Adamson ring furnace.

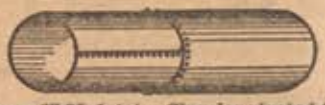


FIGURE 67.35–1 (e)—Circular riveted flue.

§ 67.35–5 Materials.

(a) All furnaces and flues shall be constructed of steel plates conforming to the requirements of Subpart 66.10 of this subchapter.

(b) The tensile strength of steel used in the construction of corrugated or ribbed furnaces shall not exceed 67,000 p. s. i. and be not less than 54,000 p. s. i.; and in all other furnaces the minimum tensile strength shall not be less than 58,000 p. s. i. and the maximum not more than 67,000 p. s. i. The minimum elongation in 8 inches shall be 20 percent.

§ 67.35–10 Computations.

(a) *Corrugated or ribbed furnaces.* All corrugated furnaces having plain parts at the ends not exceeding 9 inches in length (except flues especially provided for), when new, and made to practically true circles, shall be allowed a maximum pressure in accordance with the following formula:

$$P=\frac{C\times T}{D} \qquad (1)$$

where:

P = maximum allowable pressure in pounds per square inch.
T = thickness in inches, not less than five-sixteenths of an inch.
D = mean diameter, in inches.
C = Constant, as follows:

C=17,300, determined from an actual destructive test under the supervision of the Commandant, when corrugations are not more than 8 inches from center to center and not less than 2¼ inches deep, for Leeds Suspension bulb furnace.

C=determined from an actual destructive test under the supervision of the Commandant, when corrugations are not more than 8 inches from center to center and the radius of the outer corrugations is not more than one half of the suspension curve, for Morison furnace. [In calculating the mean diameter of the Morison furnace, the least inside diameter plus 2 inches may be taken as the mean diameter.]

C=15,600 when corrugations are not more than 8 inches from center to center and not less than 1½ inches deep, for Deighton furnace.

C=14,000, when corrugations are not more than 8 inches from center to center and not less than 1½ inches deep, for Fox furnace.

C=14,000, when rib projections are not more than 9 inches from center to center and not less than 1⅜ inches deep, for Purves furnace. [In calculating the allowable pressure for a Purves furnace, the thickness shall be not less than seven-sixteenths, and D shall be taken as the least outside diameter.]

C=14,000, determined from an actual destructive test under the supervision of the Commandant, when corrugations are not more than 9 inches from center to center and not less than 1⅜ inches deep, from Brown furnace. [In calculating the allowable pressure for Brown furnace D shall be taken as the least outside diameter.]

(b) *Corrugated furnaces having sections 18 inches long.* When furnaces are corrugated by sections not more than 18 inches from center to center, the maximum allowable pressure shall be in accordance with the following formula:

$$P=\frac{C \times T}{D} \quad (2)$$

where:

P=maximum allowable pressure, in pounds per square inch.

T=thickness in inches, not less than seven-sixteenths.

D=mean diameter, in inches.

C=10,000, a constant, when corrugated by sections not more than 18 inches from center to center and not less than 2½ inches deep, measuring from the least inside to the greatest outside diameter of the corrugations and having the ends fitted one into the other and substantially riveted together: *Provided*, That the plain parts at the ends do not exceed 12 inches in length.

(c) *Adamson furnace.* The maximum allowable pressure for Adamson furnaces made in sections of not less than 18 inches in length shall be determined by the following formula:

$$P=\frac{57.6}{D}[(18.75\times T)-1.03\times L)] \quad (3)$$

where:

P=maximum allowable pressure, in pounds per square inch.

D=outside diameter of furnace, in inches.

L=length of section, in inches.

T=thickness of plate, in sixteenths of an inch.

(d) *Spherical-top furnaces.* The minimum thickness and maximum allowable pressure of furnaces of 20 inches in diameter and over, when tops are portions of spheres and made in one plate, shall be determined by the following formula:

$$T=\frac{P\times R}{10,000}+0.12 \quad (4)$$

$$P=\frac{(T-0.12)\times 10,000}{R} \quad (5)$$

where:

P=maximum allowable pressure, in pounds per square inch.

T=thickness of plate when constructed of one plate, in inches.

R=radius of curvature, in inches.

E=efficiency riveted joint when end of furnace is constructed of more than one plate, the thickness will be T/E.

(e) *Plain circular riveted flues, furnaces, and cone tops.* (1) The maximum allowable pressure of cylindrical riveted flues and furnaces made in sections of not less than 18 inches in length fitted one into the other and substantially riveted, combustion chambers for vertical submerged tubular boilers in the shape of a frustum of a cone, constructed to a practically true circle, shall be the following formula:

$$P=\frac{51.5}{D}[(18.75\times T)-(1.03\times L)] \quad (6)$$

where:

P=maximum allowable pressure, in pounds per square inch.

D=outside diameter of furnaces, or outside mean diameter of cone top, in inches.

L=length of section or flue, in inches.

T=thickness of furnace or cone top, in sixteenths of an inch, not to be less than five-sixteenths of an inch.

(2) When diameter of plain furnaces and flues used in vertical type of boilers or mean diameter of cone tops exceed 42 inches, they shall be deemed a flat surface and must be stayed in accordance with rules governing flat surfaces. If a greater working pressure than given by formula is desired for mean diameters under 42 inches, the flues or cone tops shall be substantially stayed for such additional pressure.

(f) *Plain, lapwelded steel flues, 7 to 18 inches in diameter.* (1) Maximum allowable pressures and corresponding minimum thickness of wall for long, plain, lapwelded and seamless steel flues 7 to 18 inches diameter, subjected to external pressure only, shall be determined by the Table 67.35–10 (f) and formula (7).

TABLE 67.35–10 (f)

Outside diameter of flue	Maximum allowable pressure, in pounds per square inch						
	100	120	140	160	180	200	220
	Thickness of flue in inches. Safety factor, 5						
Inches:							
7	0.152	0.160	0.168	0.177	0.185	0.193	0.201
8	.174	.183	.193	.202	.212	.220	.229
9	.196	.206	.217	.227	.237	.248	.258
10	.218	.229	.241	.253	.264	.275	.287
11	.239	.252	.265	.277	.290	.303	.316
12	.261	.275	.289	.303	.317	.330	.344
13	.283	.298	.313	.328	.343	.358	.373
14	.301	.320	.337	.353	.369	.385	.402
15	.323	.343	.361	.378	.396	.413	.430
16	.344	.366	.385	.404	.422	.440	.459
17	.366	.389	.409	.429	.448	.468	.488
18	.387	.412	.433	.454	.475	.496	.516

(2) Thickness in Table 67.35–10 (f) were calculated by formula:

$$T=\frac{[(F\times P)+1,386]\ D}{86,670} \quad (7)$$

where:

D=outside diameter of flue, in inches.

T=thickness of wall, in inches.

P=maximum allowable pressure, in pounds per square inch.

F=factor of safety.

(3) This formula (7) is applicable to lengths greater than six diameters of flue, to pressures greater than 100 pounds, to outside diameters of from 7 to 18 inches, and to temperatures less than 650° F.

(4) The maximum allowable pressure shall be determined by the following formula:

$$P=\frac{(T\times 86,670)-(1,386\times D)}{D\times F} \quad (8)$$

where:

P=maximum allowable pressure, in pounds per square inch.

D=outside diameter of flue, in inches.

T=thickness of wall, in inches.

F=factor of safety.

(g) *Riveted flues over 6 and not over 18 inches in diameter, made in sections, and subjected to external pressure only.* The maximum allowable pressure on riveted flues constructed of plates made in sections, not less than 24 inches in length, over 6 and not exceeding 18 inches in diameter, shall be determined by the following formula:

$$P=\frac{8,100\times T}{D} \quad (9)$$

where:

P=maximum allowable pressure, in in pounds per square inch.

T=thickness in inches, minimum thickness not less than 0.25 inch.

D=outside diameter, in inches.

(h) *Riveted, seamless, or lapwelded flues over 18 and not over 28 inches in diameter, made in sections, and subjected to external pressure only.* The maximum allowable pressure on riveted, seamless, or lapwelded flues over 18 inches in diameter up to and including 28 inches in diameter, made in sections not less than 24 inches in length, effi-

ciently riveted together, sections not to exceed 3½ times the diameter of the flue, when subjected to external pressure only, shall be determined by the following formula:

$$P=\frac{51.5}{D}[(18.75\times T)-(L\times 1.03)] \quad (6)$$

where:

P=maximum allowable pressure, in pounds per square inch.
D=outside diameter of flue, in inches.
L=length of flue in inches, not to exceed 3½ diameters of flue.
T=thickness of wall, in sixteenths of an inch.

(i) *Steam chimneys.* (1) When steam chimneys constructed of flues subject to external pressure have a thickness of not less than seven-sixteenths of an inch, and the flue is heated only with the waste gases, and the temperature does not exceed 600 degrees F., the maximum allowable pressure shall be determined by the rules for plain furnaces or flues, corrugated furnaces, and Adamson type.

(2) When flues are strengthened with tee irons, angle irons, or bowling rings the pressure shall be determined by formula for plain furnace flues. When angle or tee bars are used they shall have a thickness of leaf of at least two-thirds that of plate and a depth of at least one-fourth of pitch. Said tee bars shall be substantially riveted to flue. All rivet holes in tees shall be drilled, holes shall be staggered, distance from center of rivet holes to edge of tees shall be not less than 1.5 times diameter of rivet holes, and percentage of plate section shall be not less than rivet section. Bowling rings may be used, as they increase the strength and provide for expansion of flue. For all boilers carrying a steam pressure of over 60 pounds and not over 100 pounds per square inch the flue may be braced with socket bolts in lieu of tee rings. Such bolts shall have heads and the ends shall be threaded for nuts, with plate washers or equivalent on the inside of flue. Pitch of stays and bolts and the maximum stress in pounds allowable per square inch of cross-sectional area for stays and bolts shall be determined by Subpart 67.25.

(3) If a greater allowable stress is desired on flues than that permitted by the formula for flues strengthened with bowling rings or tee irons, the flue may be braced to shell and may be deemed a flat surface, and shall be stayed in strict accordance with the rules for stays.

§ 67.35–15 Detail requirements.

(a) The thickness of corrugated and ribbed furnaces shall be ascertained by actual measurement. The manufacturer shall have said furnaces drilled for a three-eighths inch pipe tap and fitted with a screw plug that can be removed by the inspector when taking this measurement. For the Brown and Purves furnaces the holes shall be in the center of the second flat; for the Morison, Fox, and other similar types, in the center of the top corrugation, at least as far in as the fourth corrugation from the end of the furnace.

(b) (1) When plain horizontal flues are made in sections not less than 18 inches in length, and not less than five-sixteenths of an inch thick, and flanged to a depth of not less than three times the diameter of rivet holes plus the radius at furnace wall (inside diameter of furnace), the thickness of the flanges shall be as near the thickness of the body of the plate as practicable.

(2) The radii of the flanges on the fire side shall be not less than three times the thickness of plate. The distance from the edge of the rivet hole to the edge of the flange shall be not less than the diameter of the rivet hole, and the diameter of the rivets before driven shall be at least one-fourth inch larger than the thickness of the plate.

(3) The depth of the ring between the flanges shall be not less than three times the diameter of the rivet holes, and the ring shall be substantially riveted to the flanges. The fire edge of the ring shall terminate at or about the point of tangency to the curve of the flange, and the thickness of the ring shall be not less than one-half inch.

(c) When lapwelded or seamless flues over 5 inches in diameter are used in externally fired boilers over 20 feet in length, they may be allowed to be made in two pieces joined together by (1) a standard screwpipe coupling or sleeve, or by (2) swelling the end of one section of the flue sufficiently to permit it to lap over the other section not less than 4 inches and be double riveted, or by (3) butting the two sections of the flue together and fitting a band or butt strap not less than 8 inches in length equally divided over the joint of the two sections, and of a thickness of the flue, and double riveted to each section. When any of the above methods are used on more than one flue in a boiler, the couplings or sleeves shall not be allowed to come opposite, and the distance measured between any such flues and between any such flues and the shell shall be made by measuring between the plates in the flues and the plates in the shell. It shall be the duty of the inspectors to see that the flues are well screwed into the couplings or sleeves, so as to have the ends of flues as near together as is practicable.

(d) Drainpipes shall be fitted to steam chimneys in which water is liable to collect. Steam chimneys that are arranged to be disconnected from main boiler shall be provided with a safety valve not less than 3 inches in diameter and with a steam gage, and shall be provided with manholes to enable inspectors to examine every portion of the interior.

Subpart 67.40—Boiler and Superheater Tubes

§ 67.40–1 Definitions.

(a) *Tubes.* Tubes, within the meaning of this subpart, are cylindrical shells of comparatively small diameter constituting the main part of the heating surface of a boiler or superheater.

(b) *Safe end.* Safe end is a short piece of boiler tube which is usually thicker than the ordinary tube and is welded to a tube of lighter gauge for the purpose of lengthening it.

(c) *Seamless tube.* Seamless tube is a tube without any longitudinal joint.

(d) *Lap-welded tube.* Lap-welded tube made with a longitudinal rolled or hammered lap-welded joint.

(e) *Stay tube.* Stay tube is a thick-walled tube, the end of which is usually thickened by upsetting to compensate for threading. Such tubes are used for staying tube sheets into which they are screwed and expanded.

(f) *Expanding.* Expanding is the process of enlarging the end of a tube to make it fit tightly in the tube sheet.

(g) *Beading.* Beading is the process of turning over the protruding end of a tube after expanding to form a supporting collar for the tube sheet.

(h) *Bell-mouthing.* Bell-mouthing is the process of flaring the end of a tube beyond where it is expanded in the tube sheet.

§ 67.40–5 Materials and workmanship.

(a) Seamless steel boiler tubes shall comply with the requirements of Subpart 66.25 of this subchapter.

(b) Lap-welded steel and wrought-iron boiler tubes shall comply with the requirements of Subpart 66.20 of this subchapter for such tubes.

(c) Seamless copper or brass tubes not exceeding three-fourths of an inch in diameter may be used in the construction of water-tube boilers or generators when liquid fuel is used.

§ 67.40–10 Computations.

(a) *Lapwelded and seamless tubes.* Lapwelded and seamless tubes used in boilers whose construction was commenced after June 30, 1910, and having a thickness of material according to their respective diameters, shall be allowed a maximum pressure as prescribed in Table 67.40–10 (a), provided they are deemed safe by the inspectors.

TABLE 67.40–10 (a)

Outside diameter (inches)	Thickness of material, inches	Maximum pressure allowed, p. s. i.	Outside diameter (inches)	Thickness of material, inches	Maximum pressure allowed, p. s. i.
2	0.095	427	3½	0.120	308
2¼	.095	380	3¾	.120	282
2½	.109	392	4	.134	303
2¾	.109	356	4¼	.134	283
3	.109	327	5	.148	235
3¼	.120	332	6	.165	199

(b) Where heavier material is used a maximum pressure may be allowed as prescribed in § 67.35–10 (f), for determining the pressure of plain, lap-welded steel flues, 7 to 18 inches in diameter.

(c) Any length of tube is allowable.

§ 67.40–15 Safe-ending.

No tube increased in thickness by welding one tube inside of another shall be allowed for use, but the ends of boiler tubes may be welded on for the purpose of making repairs or new tubes may be welded for the purpose of making them longer: *Provided*, That such welding is not made by any process of autogenous welding.

Subpart 67.45—Safety Valves

§ 67.45–1 Definitions.

(a) *Safety valve.* Safety valve is a valve designed to open automatically to relieve excess pressure in the boiler or pressure vessel to which it is attached.

(b) *Spring loaded safety valve.* Spring loaded safety valve is a safety valve fitted with a spring to hold the valve against its seat and allows it to open at a given pressure. This term applies to pop safety valves of various forms.

(c) *Lever safety valve.* Lever safety valve is a safety valve having the disk held on its seat by the action of a weight hung on a lever which is pivoted on a fulcrum.

(d) *Relief valve.* Relief valve is a valve constructed on the general design of safety valves to relieve excess pressure. It may be used for service where an approved safety valve is not required by the regulations of this subchapter.

§ 67.45–5 General requirements.

(a) After June 30, 1928, no type of safety valve shall be used on any vessel coming under the jurisdiction of this service that has not been approved by the Commandant.

(b) The manufacturers of safety valves shall file an affidavit with the Commandant that the safety valves manufactured by them will be in all respects in accordance with the blueprints and specifications on file in the office of the Commandant, and shall permanently attach a name plate to the valves that shall show the name of the manufacturer, the pressure the casing is guaranteed to stand, diameter, seat area, serial number, and capacity.

(c) The valves shall be so arranged that each boiler shall have at least one separate safety valve, unless the arrangement is such as to preclude the possibility of shutting off the communication of any boiler with the safety valve or valves employed. This arrangement shall also apply to lockup safety valves when they are employed.

(d) The use of two safety valves may be allowed on any boiler, provided the combined area of such valves is equal to that required by rule for one such valve. Whenever the area of a safety valve, as found by the regulations in this subpart, is greater than that corresponding to 4½ inches in diameter, two or more safety valves, the combined area of which shall be equal at least to the area required, shall be used.

(e) Before any safety valve is put into service it shall be subjected to a pressure of one and one-half times the pressure it is to be subjected to when in actual service.

(f) Safety valves when fitted either to the shell of boiler or steam drum may be fitted with internal dry pipes when made of standard steam pipe or of riveted material equal in thickness, and when the combined openings in the dry pipe equal in area at least one and one-half times the opening of the valve.

(g) Where escape pipes for safety valves are installed after July 1, 1926, the area of the escape pipes shall be at least equal to the area of the outlet furnished with the safety valve, and in no case shall the area be less than the area of inlet. The fitting shall be as short and straight as possible, and so arranged as to avoid undue stress upon the valve. Where the escape pipe is used for two or more safety valves, the area of the escape pipe shall equal the combined areas of all the safety valves.

(h) Hereafter no safety valves having a set-screw arrangement on top of the valve casing, designed to hold the valve down while the hydrostatic pressure is being applied, shall be allowed. On such valves now in use, inspectors shall require the set screws to be taken out and the hole permanently closed. This does not apply to any safety valve whose form of construction is such that the hole for the set screw or bolt is securely closed when the valve is locked.

§ 67.45–10 Detail requirements.

(a) (1) The areas of all safety valves on boilers contracted for or the construction of which commenced on or after June 1, 1904, shall be determined in accordance with the following formula and table:

$$a = 0.2074 \times \frac{W}{P} \qquad (1)$$

where:

a = area of safety valve, per square foot of grate surface, in square inches.
W = pounds of water evaporated per square foot of grate surface per hour.
P = absolute pressure, in pounds per square inch = maximum allowable gage pressure 15.

(2) The areas required per square foot of grate surface in the Table 67.45–10 (a) have been computed from the formula by assuming the different valves of W and P.

(3) The areas (a) shown in Table 67.45–10 (a) multiplied by square feet of grate surface give the area of safety valve or valves required. When this calculation results in an off size of safety valve, use next larger standard size.

(b) The area of a safety valve for boilers using oil as fuel or for boilers designed for any evaporation per hour shall be computed by dividing the total number of pounds of water evaporated per hour by any number of pounds of water evaporated per square foot of grate surface per hour (W) taken from, and within the limits of Table 67.45–10 (a). This will give the equivalent number of square feet of grate surface for boiler for estimating the area of valve. Then apply the table for determining the area of the safety valve.

(c) Where safety valves are used with beveled seats, the seats shall have an angle of inclination of 45° to the center of their axes. Flat-seat safety valves may be used under the formula and table prescribed in this subpart. The discharge capacity of a flat-seat valve shall be 1.4 times that allowed for a bevel-seat valve.

§ 67.45–13 Lever safety valves.

(a) All common lever safety valves to be hereafter applied to the boilers of steam vessels shall be constructed in material, workmanship, and principle accordance to the requirements for a safety valve referred to in this section. When this construction of a safety valve is applied to the boilers of steamers navigating rough waters, the link may be connected direct with the spindle valve: *Provided, always,* That the fulcrum or points upon which the lever rests are made of steel; knife, or sharp-edged, and hardened; in this case the short end of the lever shall be attached directly to the valve casing. In all cases the link requires but a slight movement not exceeding ⅛ inch.

(b) All the points of bearing on lever shall be in the same place.

(c) The distance of the fulcrum shall in no case be less than the diameter of the valve opening.

(d) The length of the lever shall not exceed the distance of the fulcrum multiplied by ten.

(e) The width of the bearings of the fulcrum shall be not less than ¾ inch.

(f) The length of the fulcrum link shall be not less than 4 inches.

(g) The lever and fulcrum link shall be made of wrought-iron or steel and the knife-edged fulcrum points and bearings for the points shall be made of steel and hardened. But the chambers and saddle flanges of this and all other types of safety valves attached to boilers may be made of cast iron or other suitable material.

(h) The valve, valve seat, and bushing for the stem or spindle shall be made of composition (gun metal) when the valve is intended to be attached to a boiler using salt water; but when the valve is to be attached to a boiler using fresh water and generating steam of a high pressure the parts named, with the exception of the bushings for the spindle, may be made of cast iron.

(i) The valve shall be guided by its spindle, both above and below the ground seat and above the lever, through supports either made of composition (gun metal) or bushed with it. The spindle shall fit loosely in the bearings or supports.

(j) When the valve is intended to be applied to the boilers of steamers navigating rough waters, the fulcrum link may be connected directly with the spindle of the valve; providing always that the knife-edged fulcrum points are made of steel and hardened, and that the vertical movement of the valve is unobstructed by any lateral movement.

(k) In all cases the weight shall be adjusted on the lever to the pressure of steam allowed in each case by a correct steam gage attached to the boiler. The weight shall then be securely fastened in its position and the lever marked for the purpose of facilitating the replacing of the weight should it be necessary to remove the same, and in no case shall a line or any other device be attached to the lever or weight except in such a manner as will enable the engineer to raise the valve from its seat.

TABLE 67.45-10 (a)—AREA OF SAFETY VALVES REQUIRED PER SQUARE FOOT OF GRATE SURFACE FOR DIFFERENT PRESSURES AND RATES OF EVAPORATION

P, absolute pressure, pounds per square inch	Gage pressure, pounds per square inch	These figures represent evaporation in pounds per square foot of grate surface per hour (W) = pounds water evaporated per pound coal × pounds coal burned per square foot of grate surface per hour														
		100	120	140	160	180	200	220	240	260	280	300	320	340	360	380
		The figures below give (a), the area in square inches required per square foot of grate surface at above rate of evaporation														
65	50	0.319	0.383	0.447	0.510	0.574	0.638	0.702	0.765	0.829	0.893	0.956				
70	55	.296	.355	.414	.474	.533	.592	.652	.711	.769	.828	.888				
75	60	.276	.332	.387	.442	.497	.552	.608	.663	.718	.773	.829				
80	65	.259	.311	.363	.415	.466	.518	.570	.622	.674	.726	.778				
85	70	.244	.292	.341	.390	.438	.487	.536	.585	.634	.682	.731				
90	75	.230	.276	.322	.368	.414	.460	.506	.552	.598	.644	.690				
95	80	.218	.262	.305	.349	.392	.436	.479	.523	.567	.610	.654				
100	85	.207	.249	.290	.332	.373	.414	.456	.497	.538	.580	.622				
105	90	.197	.236	.276	.316	.355	.394	.434	.473	.513	.552	.592				
110	95	.188	.226	.264	.301	.339	.377	.414	.452	.489	.527	.565				
115	100	.180	.216	.252	.288	.324	.360	.396	.432	.468	.504	.540				
120	105	.172	.207	.241	.276	.311	.345	.379	.414	.448	.483	.517				
125	110	.166	.199	.232	.265	.298	.331	.364	.397	.431	.463	.497				
130	115	.160	.192	.223	.255	.287	.319	.351	.383	.415	.447	.479				
135	120	.153	.184	.215	.246	.276	.307	.337	.368	.398	.429	.460				
140	125	.148	.177	.207	.237	.266	.296	.325	.355	.385	.414	.444				
145	130	.143	.172	.201	.229	.258	.287	.315	.344	.372	.401	.430				
150	135	.138	.166	.194	.222	.249	.277	.304	.332	.360	.387	.415				
155	140	.134	.160	.187	.214	.241	.268	.294	.321	.348	.375	.401				
160	145	.130	.156	.181	.207	.233	.259	.285	.311	.337	.363	.389				
165	150	.126	.151	.176	.201	.226	.251	.276	.301	.326	.352	.378				
170	155	.122	.146	.171	.195	.219	.244	.268	.292	.317	.341	.366				
175	160	.118	.142	.166	.189	.213	.236	.260	.284	.308	.331	.355				
180	165	.115	.138	.161	.184	.207	.230	.254	.277	.300	.323	.346				
185	170	.112	.135	.157	.179	.202	.224	.247	.269	.291	.314	.336				
190	175	.109	.131	.153	.175	.196	.218	.240	.262	.284	.306	.328				
195	180	.106	.128	.149	.170	.191	.213	.234	.255	.277	.298	.319				
200	185	.104	.124	.145	.166	.187	.207	.228	.249	.270	.290	.310				
205	190	.101	.121	.142	.162	.182	.202	.223	.243	.263	.283	.303				
210	195	.099	.119	.138	.158	.178	.198	.217	.237	.257	.277	.297				
215	200	.096	.116	.135	.154	.173	.193	.212	.231	.250	.269	.289	0.308	0.327	0.347	0.366
220	205	.094	.113	.132	.151	.170	.189	.208	.226	.245	.264	.283	.302	.321	.340	.358
225	210	.092	.110	.129	.147	.166	.184	.203	.221	.240	.258	.276	.295	.314	.332	.350
230	215	.090	.108	.126	.144	.162	.180	.198	.216	.235	.253	.270	.289	.307	.325	.343
235	220	.088	.106	.124	.141	.159	.176	.194	.212	.229	.247	.264	.282	.300	.318	.336
240	225	.086	.104	.121	.138	.155	.173	.190	.207	.225	.242	.259	.276	.294	.311	.329
245	230	.085	.102	.119	.135	.152	.170	.186	.203	.220	.237	.254	.271	.288	.305	.322
250	235	.083	.100	.117	.133	.149	.167	.183	.199	.216	.233	.249	.266	.282	.299	.315
255	240	.081	.098	.114	.130	.146	.163	.179	.195	.211	.228	.244	.261	.277	.293	.309
260	245	.080	.096	.112	.128	.144	.160	.176	.192	.208	.224	.240	.255	.271	.287	.303
265	250	.078	.094	.110	.125	.141	.157	.172	.188	.203	.219	.235	.250	.266	.282	.298
270	255	.077	.092	.107	.123	.138	.153	.169	.184	.199	.215	.230	.245	.261	.276	.291
275	260	.075	.090	.105	.121	.136	.151	.166	.181	.196	.211	.226	.241	.256	.271	.286
280	265	.074	.089	.104	.118	.133	.148	.163	.178	.192	.207	.222	.237	.251	.266	.281
285	270	.073	.087	.102	.116	.131	.146	.160	.175	.189	.204	.218	.233	.247	.262	.276
290	275	.072	.086	.100	.114	.129	.143	.157	.172	.186	.200	.214	.228	.242	.257	.271
295	280	.070	.084	.098	.112	.127	.141	.154	.169	.182	.196	.210	.224	.238	.253	.267
300	285	.069	.083	.096	.110	.124	.138	.151	.166	.179	.193	.207	.221	.235	.249	.263
305	290	.068	.082	.095	.109	.122	.136	.149	.163	.177	.190	.204	.217	.231	.245	.258
310	295	.067	.080	.093	.107	.120	.134	.147	.160	.174	.187	.201	.214	.227	.241	.254
315	300	.066	.079	.092	.105	.118	.132	.145	.158	.171	.184	.197	.210	.223	.237	.250

§ 67.45–15 Spring-loaded safety valves.

Any spring-loaded safety valve constructed so as to give an increase lift by the operation of steam after being raised from its seat, or any spring-loaded safety valve constructed in any other manner, so as to give an effective area equal to that of the afore-mentioned spring-loaded safety valve, may be used in lieu of the common lever-weighted valve on all boilers on steam vessels, and each spring-loaded valve shall be supplied with a lever that will raise the valve from its seat a distance of not less than that equal to one-eighth of the diameter of the valve opening; but in no case shall any spring-loaded safety valve be used in lieu of the lever-weighted safety valve without first having been approved by the Commandant.

Subpart 67.50—Boiler Mountings and Attachments

§ 67.50–1 Definitions.

(a) *Mountings.* Mountings, within the meaning of this subchapter, are nozzle connections, distance pieces, valves, or fittings attached directly to the boiler.

(b) *Main stop valve.* Main stop valve is a valve usually connected directly to the boiler for the purpose of shutting off the steam from the main steam line.

(c) *Auxiliary stop valve.*—Auxiliary stop valve is a valve usually connected directly to the boiler for the purpose of shutting off the steam from the auxiliary lines (including the whistle lines).

(d) *Manifold.* Manifold is a fitting with two or more branches having valves either attached by bolting or integral with the fitting.

(e) *Feed valve.* Feed valve is a valve in the feed-water line which controls the boiler feed.

(f) *Blow-off valve.* Blow-off valve is a valve connected directly to the boiler for the purpose of blowing out water, scum, or sediment.

(g) *Dry pipe.* Dry pipe is a perforated or slotted pipe placed in the highest part of the steam space of a boiler to prevent priming.

(h) *Water column.* Water column is a fitting or tube equipped with a water glass attached to a boiler for the purpose of indicating the water level.

(i) *Test cocks.* Test cocks are small cocks on a boiler for indicating the water level.

(j) *Salinometer cocks.* Salinometer cocks are cocks attached to a boiler for the purpose of drawing off a sample of water for salinity tests.

(k) *Fusible plugs.* Fusible plugs are plugs made with a bronze casing and a tin filling which melts at a temperature of 450 degrees to 500 degrees F. They are intended to melt in the event of low water and thus warn the engineer on watch.

§ 67.50–5 Detailed requirements.

(a) Where the thickness of the material in the boiler or drum, or the heads thereof, is not less than ½ inch, or where such boiler, drum, or head thereof has been reinforced by having a pad or flange riveted on the same, to make the thickness not less than ½ inch, pipes or fittings of 2 inches in diameter or under may be screwed directly into the same. Where steam or feed pipes of 2 inches in diameter or under are screwed into the boiler, the stop valve shall be connected to the boiler by as short a nipple as it is possible to use, nipples to be of extra-heavy thickness.

(b) All boiler connections of over 2 inches in diameter, except the connections for safety valves, shall be permanently flanged and attached directly to the boiler by bolts, studs, or rivets.

(c) Where the connecting point on the boiler is of circular form, distance pieces shall be allowed in order to square the point of the flanged fittings.

(d) Flanged distance pieces of not more that 8 inches between flanges may be allowed between stopcocks or valves and the boiler when necessary to care for and conveniently handle the valves, when such distance pieces are constructed of wrought material of sufficient thickness and strength to withstand any pressure to which they may be subjected and securely riveted to the boiler.

(e) Cast-steel flanged fittings, when conforming strictly with the requirements for steel castings, may be used for the purpose of connecting main and auxiliary stop valves and other steam outlets, including safety valves, distance from axis of outlets of such fittings to point of connection with boiler to be as short as practicable.

(f) All valves and fittings over 2 inches diameter shall be flanged and properly secured at point of connection with boiler by bolts, studs, or rivets, and no fitting shall be of greater length than specified by the "Manufacturers' Standard."

(g) Cast nozzles shall not be used when exposed to the direct action of the fire.

(h) On all boilers built after July 1, 1896, a stopcock or value shall be placed between all check valves and boiler, and between all steam and water pipes and boiler. Valves of 2 inches diameter or less connected directly to the boiler shall be of cast steel, hard brass, or bronze.

(i) The use of malleable-iron or cast-steel manifolds, tees, return bends, or elbows in the construction of pipe generators shall be allowed, and the pressure of steam shall not be restricted to less than one-half the hydrostatic pressure applied to pipe generators unless a weakness should develop under such test as would render it unsafe in the judgment of the inspector making such inspection.

§ 67.50–10 Superheaters.

(a) The headers of superheaters may be made of semisteel (so-called) in which the constituent part of high-grade uniform steel thereof shall be not less than 25 percent and that the material shall have a tensile strength of not less than 28,000 pounds per square inch. The material shall be soft and close-grained and the castings shall be tight under a hydrostatic pressure of 850 pounds per square inch.

(b) When interdeck superheaters are used in connection with water-tube boilers of approved design, and the fittings and pipes between the drum of the boilers and the header of the superheaters are made of seamless steel and of a thickness in accordance with the rules to withstand any pressure sustained by any part of the boiler, such fittings connecting with pipes of steam drum or superheater shall be either steel forgings or steel castings. The stop valve may be attached to the discharge end of the superheater: *Provided*, That this section shall not apply to safety valves that have been approved by the Commandant.

§ 67.50–15 Feed connections.

Feed water shall not be admitted into any marine boiler at a temperature less than 100 degrees F., and every such boiler, excepting donkey boilers, shall after October 31, 1909, have an independent auxiliary feed appliance for supplying said boiler with water in addition to the usual mode employed, which auxiliary feed shall enter the boiler through an opening and a fitting which are entirely independent of the fitting and opening for the main feed.

§ 67.50–20 Fusible plugs.

(a) Fusible plugs for use in boilers of vessels inspected under this Subchapter shall be manufactured from acceptable heats in accordance with Subpart 162.014 of Subchapter Q (Specifications) of this chapter.

(b) Every boiler other than a boiler of the water-tube type shall be fitted with at least two fusible plugs located as follows:

(1) An upright boiler shall be fitted with two plugs of an external diameter of not less than ⅜ inch pipe tap. The plugs shall be located in separate tubes not more than 2 inches below the lowest gage cock.

(2) An externally heated cylindrical boiler, with flues, shall have one plug in the top of the upper flue, not more than 4 feet from the back end of the flue, and shall also have a plug fitted to the shell of the boiler immediately below the fire line, and not less than 4 feet from the front end: *Provided*, That when the flues are not more than 6 inches in diameter plugs of not less diameter than ⅜ inch pipe tap may be used in such flues.

(3) Fire-box, scotch, and any other type of shell boiler not specially provided for, having a combustion chamber common to all furnaces, shall have two plugs fitted to the crown sheet of the combustion chamber at or near the center of the crown sheet and not more than 12 inches apart.

(4) A double-end boiler with separate combustion chambers, each of which combustion chamber is common to all furnaces in its own end of the boiler, shall have two plugs fitted to the crown sheet of each combustion chamber at or near the center of the crown sheet, and not more than 12 inches apart.

(5) A boiler fitted with a separate combustion chamber for each individual furnace shall be fitted with a plug in the center of the crown sheet of each combustion chamber.

(6) A boiler of any type not herein provided for shall be fitted with at least two plugs of such dimensions and located in such parts of the boiler as will, in the judgment of the Officer in Charge, Marine Inspection, best meet the purposes for which they are intended.

(c) (1) Fusible plugs shall be cleaned and will be examined by the marine inspector at each inspection for certification, and oftener, if necessary. If in the marine inspector's opinion the condition of any plug is satisfactory, it may be continued in use.

(2) When fusible plugs are renewed at other than the inspection for certification and no marine inspector is in attendance, the chief engineer shall submit a written report to the Officer in Charge, Marine Inspection, who issued the Certificate of Inspection informing him of the renewal. This letter report shall contain the following information:

(i) Name and official number of vessel.

(ii) Date of renewal of fusible plugs.

(iii) Number and location of fusible plugs renewed in each boiler.

(iv) Manufacturer and heat number of each plug.

(v) Reason for renewal.

(d) Fusible plugs shall be so fitted that the smaller end of the filling is exposed to the fire, and shall be at least 1 inch higher on the water side than the plate or flue in which they are fitted.

(e) Notwithstanding anything which may be contained in this section, fusible plugs shall be so fitted that the end of the filling on the water end of the plug is not less than 1 inch above the dangerous low-water level.

§ 67.50–25 Gage cocks and water glass.

(a) All boilers, except flash boilers, shall be supplied with at least one reliable water gage, and at least three gage cocks attached directly to each boiler. When the gage glass and gage cocks are connected to the boilers by a water column there shall be three additional gage cocks inserted in the head or shell of boiler. The lower gage cock in boilers more than 48 inches in diameter shall be not less than 4 inches above the top of the flues, tubes, or combustion chambers. In boilers less than 48 inches in diameter the lower gage cock shall be not less than 2½ inches above the top of the flues, tubes, or combustion chambers. A gage glass shall be considered a reliable water gage, and a float such as used on western river steamers shall be considered on such boilers as a reliable water gage: *Provided*, That when water-tube boilers have an efficient water column connected to the steam drum of said boiler at the top and the water manifold at the bottom, and such water column has a gage glass and three gage cocks fitted to same, and also is fitted with a valve or stopcock, both at top and bottom where the column is connected to the boiler, no gage cocks shall be required in the head or shell of the drums of such water-tube boilers.

(b) Double-end boilers shall have at least three gage cocks and one water glass at each end.

(c) In vertical boilers of the water-tube type the location of the lowest gage cock shall be determined by the Officer in Charge, Marine Inspection.

§ 67.50–30 Steam gages.

All boilers or sets of boilers shall have attached to them at least one gage that will correctly indicate a pressure of steam equal to 80 percent of the hydrostatic pressure applied by the inspectors.

Subpart 67.55—Evaporators, Feed-Water Heaters, Separators, and Steam Traps Made of Cast Iron and Subject to Boiler Pressure

§ 67.55–1 Computations.

(a) When evaporators, feed heaters, separators, and steam traps are constructed of cast iron possessing a tensile strength of not less than 20,000 pounds per square inch, the shells being cylindrical and ends flat or convex, the castings sound and of uniform thickness, the maximum allowed pressure shall be determined by the following formulas:

(1) For flat surface:

$$P=\frac{20{,}000\times T^2}{D^2} \quad (1)$$

$$T=\sqrt{\frac{P\times D^2}{20{,}000}} \quad (2)$$

(2) For cylindrical shell:

$$P=\frac{3{,}500\times T}{D} \quad (3)$$

$$T=\frac{P\times D}{3{,}500} \quad (4)$$

where:

P=maximum allowable pressure in pounds per square inch.
T=thickness, in inches.
D=diameter inside, in inches. When the pressure is to be determined for a part of a flat surface which is a square, or rectangle in the flat-surface formula, the value of D used shall be the diagonal of the square or rectangle, and when the ends are bolted to the shell the value of D used shall equal the diameter of the bolt circle.

(b) The thickness of ends of evaporators, feed heaters, and separators shall be not less than ⅜ inch. To the resultant thickness obtained by the formula given above there shall be added, for cylinders having an inside diameter of 1 inch to 6 inches, inclusive, ¼ inch; for cylinders having an inside diameter of over 6 inches to 15 inches, inclusive, ⅛ inch.

(c) All flanges shall be substantial, and there shall be a good fillet all around the root, and when the ends and shell are cast solid there shall be a good and substantial fillet inside all around.

(d) The bolts or studs for the ends or doors shall not have a greater stress than 6,000 pounds per square inch, and the size of bolts or studs shall be not less than ¾ inch in diameter.

§ 67.55–5 Evaporators.

Evaporators shall be provided with an efficient safety valve of approved type, set to blow at the maximum pressure to which the evaporator will be subjected in service, and it shall be the duty of the engineer in charge of the vessel to see that such valve blows off at least once in 30 days.

PART 68—PIPING SYSTEMS

Subpart 68.01—General

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Subpart 68.05—Detail Requirements

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68.05–25 Fuel-oil service systems.
68.05–30 Vent piping.
68.05–35 Sounding pipes.
68.05–40 Welded piping.

AUTHORITY: The provisions of this Part 68 issued under R.S. 4405, as amended, 4462, as amended; 46 U.S.C. 375, 416. Interpret or apply R.S. 4399, as amended, 4400, as amended, 4417, as amended, 4417a, as amended, 4418, as amended, 4421, as amended, 4426–4431, as amended, 4433, as amended, 4434, as amended, 4453, as amended, 4488, as amended, 4491, as amended, sec. 14, 29 Stat. 690, as amended, sec. 10, 35 Stat. 428, as amended, 41 Stat. 305, as amended, secs. 1, 2, 49 Stat. 1544, 1545, as amended, sec. 17, 54 Stat. 166, as amended, sec. 3, 54 Stat. 347, as amended, sec. 3, 70 Stat. 152, sec. 3, 68 Stat. 675; 46 U.S.C. 361, 362, 391, 391a, 392, 399, 404–409, 411, 412, 435, 481, 489, 366, 395, 363, 367, 526p, 1333, 390b, 50 U.S.C. 198; E.O. 11239, July 31, 1965, 30 F.R. 9671, 3 CFR, 1965 Supp. Treasury Department Orders 120, July 31, 1950, 15 F.R. 6521; 167–14, Nov. 26, 1954, 19 F.R. 8026; 167–20, June 18, 1956, 21 F.R. 4894; CGFR 56–28, July 24, 1956, 21 F.R. 5659; 167–38, Oct. 26, 1959, 24 F.R. 8857.

Subpart 68.01—General

§ 68.01–1 Scope.

(a) This part contains requirements for the various ships' piping and appurtenances.

(b) The respective piping systems installed on vessels shall have the necessary pumps, valves, regulating valves, safety valves, relief valves, flanges, fittings, pressure gages, liquid level indicators, thermometers, etc., for safe and efficient operation of the vessel.

§ 68.01–5 Definitions.

(a) *Piping.* The word "piping" within the meaning of this subchapter, refers to fabricated pipes or tubes with flanges and fittings attached, for use in the conveyance of vapors, gases or liquids, regardless of whether the diameter is measured on the inside or the outside.

(b) *Nominal diameter.* The term "nominal diameter" as used in this part, means the commercial diameter of the piping.

(c) *Fitting.* The term "pipe fittings" refers to all hollow cylindrical fittings, and does not apply to flanges or valves.

§ 68.01–10 Affidavit.

(a) When the manufacturers of steam and water pipes file with the Commandant a certificate duly sworn to that all such pipes manufactured by them will stand all the tests and meet all the applicable requirements of this chapter, they shall be accepted by inspectors of the Coast Guard.

(b) The manufacturer of valves and fittings shall file with the Commandant a certificate duly sworn to that all valves and fittings furnished by him for use on steam vessels comply with the requirements of this subchapter.

(c) After July 1, 1911, the Officer in Charge, Marine Inspection, shall refuse to allow the use of any valves or fittings on steam vessels until notified by the Commandant that such certificate is on file in his office. This shall not apply to valves and fittings installed previous to July 1, 1911.

Subpart 68.05—Detail Requirements

§ 68.05–1 Material.

(a) Welded steam and water pipes may be permitted for pipe diameters from ⅛ inch inside diameter up to and including 30 inches inside diameter. The pipe shall be made of wrought iron or mild steel, smooth, straight, and free from defects. Threaded pipe of standard thickness shall be avoided as far as possible. In steam pipes it is a very serious matter and shall not be allowed in any case on standard pipe over 5 inches in diameter. All pipe over 2 inches in diameter shall be lap-welded.

(b) Cast-steel fittings of any size or character and for any pressure and for any temperature may be used for any and all steam and feed-pipe connections, and for valves, cocks, and all appliances subject to steam or water pressure, when made by regular processes and by manufacturers who stamp such fittings and appliances with their trade-mark or identifying stamp and who guarantee the castings to possess the following physical characteristics: Tensile strength, minimum, 50,000; maximum, 78,000 pounds per square inch; elastic limit, minimum, not less than 45 percent of tensile strength; elongation in 2 inches, minimum, 25 percent. There shall be taken from each heat an annealed coupon or coupons, for the purpose of determining the physical tests, and the manufacturers shall furnish coupons to the Officer in Charge, Marine Inspection, for tests when so required. All steel castings shall be thoroughly annealed.

(c) Cast iron, semisteel, or ferrosteel, possessing a tensile strength of not less than 22,000 pounds to the sectional square inch, may be used in the construction of valves and fittings for pressures not exceeding 300 pounds when such valves and fittings of 3 inches diameter or over are stamped with the trade-mark or identifying stamp of the manufacturer.

(d) Malleable iron possessing a tensile strength of not less than 30,000 pounds to the sectional square inch may be used in the construction of valves and fittings up to and including 6 inches in diameter, and for pressures not exceeding 300 pounds. Such valves and fittings of 3 inches diameter or over shall be extra heavy, the fitting beaded or banded, and the valves and fittings stamped with the trade-mark or identifying stamp of the manufacturer.

(e) Hard brass, bronze, and other compositions, of which 95 percent is copper, tin, and zinc, possessing a tensile strength of not less than 30,000 pounds to the square inch, may be used in the construction of all valves and fittings up to and including 12 inches in diameter. All such fittings of 3 inches in diameter or over shall be stamped with the trade-mark or identifying stamp of the manufacturer.

(f) The following material shall be permitted at the allowable temperatures indicated:

(1) Cast iron, malleable iron, semisteel, and ferrosteel may be used in connection with temperatures up to and including 450 degrees F.

(2) Hard brass, bronze, and other compositions, of which 95 percent is copper, tin, and zinc, may be used in connection with temperatures up to and including 470 degrees F., but this temperature may be increased to 550 degrees F. when the manufacturer of the valves

or fittings stamps them with the temperature they are guaranteed to stand without disintegration. This paragraph will also apply to any composition meeting the above physical requirements and stamped in accordance therewith.

(3) For temperatures exceeding 550 degrees F. no valves or fittings other than steel or of a composition whose tensile strength has been demonstrated to exceed 50,000 pounds per sectional square inch with an elongation of 10 percent in a length of 2 inches shall be allowed. Such valves and fittings shall be stamped as above required.

§ 68.05–5 Computations.

(a) *Steel and iron pipe.* (1) Thickness of and pressure allowed on main steam pipe constructed of riveted iron or steel plates that have been stamped and tested as required by R.S. 4430 (46 U.S.C. 408), shall be determined in the same manner as required by R.S. 4433 (46 U.S.C. 411), to determine the pressure allowable on boilers.

(2) The thickness of and maximum allowable pressure on all lapwelded or solid-drawn steam pipe of wrought iron or steel shall be determined by the following formulas:

$$T=\frac{P\times D}{10{,}000}+0.125 \qquad (1)$$

$$P=\frac{(T-0.125)\times 10{,}000}{D} \qquad (2)$$

where:

P = maximum allowable pressure, in pounds per square inch.
T = thickness of pipe, in inches.
D = diameter of pipe, in inches.

(b) *Copper pipe.* (1) The thickness of copper pipe, according to the maximum allowable pressure, shall be determined by the following formulas:

$$T=\frac{P\times D}{8{,}000}+0.0625 \qquad (3)$$

where:

T = thickness, in inches.
P = maximum allowable pressure, in pounds per square inch.
D = inside diameter of pipe, in inches.

(2) All copper pipe subject to pressure and installed for use on steam vessels after July 1, 1911, shall have a thickness of material according to the maximum allowable pressure, to be determined by the following formula:

$$T=\frac{P\times D}{6{,}000}+0.0625 \qquad (4)$$

where:

T = thickness, in inches.
P = maximum allowable pressure, in pounds per square inch.
D = inside diameter of pipe, in inches.

(c) *Steel fittings.* The minimum thickness of steel fittings shall be determined by the following formula:

$$T=\frac{P\times D}{7{,}000}+0.188 \qquad (5)$$

where:

P = maximum allowable pressure, in pounds per square inch.
D = diameter, in inches.
T = thickness, in inches.

(d) *Cast iron fitting.* The minimum thickness of cast iron, semisteel, or ferrosteel fittings shall be determined by the following formula:

$$T=\frac{P\times D}{3{,}000}+0.25 \qquad (6)$$

where:

T = thickness of casting, in inches.
P = maximum allowable pressure, in pounds per square inch.
D = internal diameter of the largest opening contained in the cylindrical part of the casting in inches.

(e) *Nonferrous slip joints.* (1) The wearing surface of the male pipe in all slip joints made after June 30, 1908, for use in steam pipes shall be made of copper or composition, and shall be of sufficient length and so adjusted as to prevent accidental withdrawal from the packing box. When made of composition, same shall be of not less than 95 percent copper, tin, and zinc, possessing a tensile strength of not less than 30,000 pounds to the square inch. It may be used for sizes up to and including 12 inches in diameter, and for all pressures not exceeding 300 pounds per square inch.

(2) The minimum thickness of such fittings shall be determined by the following formula:

$$T=\frac{P\times D}{4{,}000}+0.22 \qquad (7)$$

where:

P = maximum allowable pressure, in pounds per square inch.
D = diameter, in inches.
T = thickness, in inches.

§ 68.05–10 Valves and fittings.

(a) Valves and fittings of 3 inches and under may be connected by screw threads at their intermediate joints in pipe lines.

(b) Each and every valve for marine service shall have the trade-mark of the manufacturer cast or stamped on the chamber. All such valves of 2 inches diameter and over shall be subjected by the manufacturer before shipment to a hydrostatic pressure of three times the working pressure which the manufacturer guarantees them to stand without distorting, and shall also be stamped with such working pressure and also the letters "M. S." which shall plainly indicate that the valve has met the test requirements for marine service.

(c) All valves of over 2 inches diameter, without regard for the service for which they are intended, installed after April 30, 1917, shall have bolted bonnets.

(d) Screwed bonnets on cast-iron valves of any size and for any character of service are positively prohibited.

(e) All pipe fittings of more than 3 inches internal diameter shall be subjected by the manufacturer to a test of three times the pressure to which they will be subjected in service.

§ 68.05–13 Joints and flanged connections.

(a) *Flanges and connections for wrought-iron and homogeneous-steel feed and steam pipe.* (1) The terminal and intermediate flanges of all wrought-iron and homogeneous-steel feed and steam pipe over 2 inches in diameter, other than on pipe or coil boilers of steam generators, shall be made of wrought iron, homogeneous steel, malleable iron having a tensile strength of not less than 30,000 pounds per square inch of section, or equivalent material.

(2) All such flanges shall have a depth through the bore of not less than one-half of the diameter of the pipe to which the flange is attached.

(3) The bore shall increase slightly toward the face of the flange, and the end of the pipe shall be enlarged to fit the bore of the flange and shall be substantially beaded over or outward into a recess in the face of the flange.

(4) Flanges on extra heavy lap-welded steam pipe up to and including 5 inches diameter may be attached with screw threads and the joints in bends may be made with extra heavy malleable-iron elbows or equivalent material.

(5) Feed and steam pipe up to and including 3 inches diameter may be connected at intermediate joints by being screwed into flanges or extra heavy fittings.

(6) Flanges of cast iron, semisteel, or ferrosteel, having a tensile strength of not less than 20,000 pounds per square inch of section, may be employed in connecting extra heavy lap-welded pipe by screw threads. Such flanges shall be extra heavy and have a depth through the bore of not less than the United States standard length of thread for the pipe to which the flange is attached plus depth of counterbore. The thickness of the flange, excluding hub, shall be not less than three-tenths of the diameter of the pipe plus 0.25 of an inch. The pipe shall fit snugly in the counterbore, which shall be not less than one-fourth the diameter of the pipe in depth.

(7) Flanges of wrought iron or steel grooved in the bore to a depth equal to the thickness of the material in the pipe shall be allowed for use on all steam and feed pipe when the end of the pipe has been thoroughly annealed and expanded into the flange by approved machinery.

(8) Flanges with hubs projecting not less than 1¾ inches from the back of the flange may be shrunk on lapwelded or riveted-iron or steel or seamless-drawn steel steam pipes over 5½ inches diameter where the pipe is brought to a true and parallel circle at the end and beaded over into a recess at the face of the flange, or flared to an angle of approximately 20 degrees or the bore of the flange may be tapered and the pipe expanded into the bore.

(9) Flanges of cast steel, wrought iron, or homogeneous steel, equal in strength to the pipe to which it is attached, may be riveted to the pipe. When pipe is used for steam lines where flanges are riveted on and calked, the ends of the pipe shall be properly annealed before drilling or riveting the flanges on.

(10) Flanges may be secured to pipe by expanding the pipe by proper and approved machinery and flaring the end of the pipe to an angle not exceeding 20 degrees, taken in the direction of the length of the pipe, and having a depth of flare equal to at least one and one-half times the thickness of the pipe.

(11) Flanges of cast steel, forged steel, or wrought iron may be used in any process of expanding the pipe into grooves in the bore of the flange and flaring the end of the pipe to an angle of 20 degrees.

(12) Flanges welded to lapwelded steam pipes of iron or steel may be used when the manufacturer furnishes an affidavit that the pipe has been properly annealed after all work requiring fire has been finished.

(13) All flange connections made by the process of expanding, welding, or shrinking shall be subjected to a hydrostatic test of twice the working pressure without showing signs of weakness.

(b) *Flanges on copper pipe.* (1) The flanges of all copper steam and feed pipe over 3 inches diameter shall be made of brass or bronze composition, forged-iron, or steel or open-hearth steel castings. The end of the pipe shall be flanged over or outward to a width of not less than twice the thickness of the pipe and to a radius of not more than the thickness of the pipe, and the flange securely brazed or riveted to the pipe. If the pipe is properly formed with a full reinforced taper through the flange, the riveting or brazing may be dispensed with. The thickness of flanges shall be not less than four times the required thickness of the pipe plus 0.25 of an inch.

(2) Any form of expanded, grooved, and flared joint will be allowed for copper pipe under the same regulations, restrictions, and tests applying to iron or steel pipe.

(3) All flange joints shall be fitted with such number of bolts or rivets as will make the joint equal in strength to all other parts of the pipe.

(4) Any form of joint which, in the judgment of the Officer in Charge, Marine Inspection, is equal in strength and efficiency to the flange connections required by this section shall be allowed on any and all classes of pipe.

§ 68.05–15 Installation.

(a) Where vent and sounding pipes pass through cargo spaces they shall be protected against damage.

(b) No copper pipe constructed after June 30, 1905, shall have any bend whose radius is less than one and one-half times the diameter of the pipe and such pipe shall be so led and flanges so placed that they may be readily taken down if required. Such pipes shall be protected by iron casings when run through coal bunkers, and shall be clear of the coal chutes.

(c) All sea valves or cocks secured to the skin of the vessel by bolts and connected to the engines or boilers by pipes shall be arranged so as to be accessible at all times, so that if a leak or defect occurs it can be reached. All parts of said valves except the chamber shall be made of brass or bronze when used on wooden-hull vessels navigating salt water; but in the case of vessels of iron or steel the brass or bronze bolts may be dispensed with.

§ 68.05–20 Fuel oil filling and transfer system.

(a) *Ocean and coastwise.* (1) The construction of fuel-oil tanks separate from the hull shall conform to the following requirements: Plating for such tanks shall be not less than $\frac{5}{16}$ inch in thickness; seams where the plates are joined shall be double-riveted; all rivet holes shall be fairly drilled, or punched three-fourths diameter and reamed to size; rivet holes shall be spaced not to exceed four diameters; and, where practicable, the tanks shall be caulked inside and out.

(2) Where double bottoms are used for the storage of fuel oil, such double bottoms shall be subdivided with one or more longitudinal watertight bulkheads, except the narrow tanks at the forward and after ends of the vessel. This requirement shall also apply to fuel-oil deep tanks which shall also be fitted with the necessary swash plates. The hatch covers on deep tanks which are used for fuel oil shall be made of steel or iron plating and be fitted oiltight. Fuel-oil tanks in 'tween-deck spaces overhanging the boiler space or adjoining the ship's sides abreast of the boilers shall be avoided as far as practicable, but where found to be necessary, they shall be subdivided into compartments not exceeding 20 feet in length.

(3) The test for fuel-oil tanks that do not form a part of the structure of the hull shall be a hydrostatic test of 15 pounds to the square inch, and all other tanks shall be tested with a pressure that will not be exceeded in practice.

(4) Deep tanks, peak tanks, settling tanks, and tanks separate from the hull used for the storage of fuel oil shall be fitted with internal gate valves where the suction pipe or pipes penetrate the tank, the valves to be fitted with mechanical appliances so arranged that they may be operated from an accessible place on deck outside of the machinery space. Double-bottom fuel-oil tanks shall be fitted with a gate valve on the tank top where the suction pipe penetrates it, or, where the suction pipe leads under the tank tops, the valve shall be placed where the pipe enters the machinery space.

(b) *Great Lakes; lakes, bays, sounds, and rivers.* (1) The fuel-oil tanks on all inland steamers subject to the requirements in this subchapter shall be constructed of material of such thickness and workmanship as, in the judgment of the inspector where the installation is made, is safe.

(2) All pipe connections on fuel-oil tanks and cargo-oil tanks, except the connection or connections on the top of such tank, shall be protected by an internal gate valve operated by an extension rod leading to an accessible point in an open space on a deck outside the engine and fireroom casing, so that the flow of oil may be immediately shut off in the case of failure or rupture of any of the pipes or connections.

(c) No openings are to be cut in the bottoms, ends, or sides of fuel-oil tanks except for suction and heater connections.

(d) All pipes over 2 inches in diameter shall be attached to fuel-oil tanks by flanges, or flanged fittings, riveted to the tanks. Filling pipes for such tanks shall deck, and such pipes shall be led to the extend through the top of the tank to bottoms of the tanks and fitted with U-bends extending upward at least 12 inches above the bottoms; or in lieu of the U-bends the pipes may be led to within one-half of the diameter of the pipes from the bottom of the tanks.

§ 68.05–25 Fuel-oil service systems.

(a) The piping between the service pumps and the stop valve at the burners, when the pressure exceeds 15 pounds per square inch, shall be extra-heavy seamless piping and shall be in sight above the floor or platform. The connections on such piping shall be made with extra-heavy flanges or extra-heavy fittings of forged or cast steel, bronze, or malleable iron. Valves on pipe lines conveying hot oil shall be extra heavy and shall be of the locked-bonnet, bolted-bonnet, or union-nut-bonnet type.

(b) The piping, including connections, shall be tested in place to a hydrostatic test pressure equal to three times the designed maximum working pressure, but in no case less than 150 pounds. All other piping for use in conveying fuel oil, together with valves, and fittings, shall be suitable for a pressure of 125 pounds and all such pipe and fittings between the gate valve within the tank and the pumps shall be tested to a hydrostatic pressure of 250 pounds.

(c) When it is desired to change a low-pressure system to a high-pressure system, it will be necessary to apply a hydrostatic test pressure to the piping and connections from pumps to burners equal to three times the working pressure.

(d) All oil heaters shall be tested to double the working pressure. Continuous pipe or pipes shall be carried through the heads or ends of the heaters, and all joints shall be made on the outside to eliminate the danger of oil being pumped into the boilers in the event of failure of the joints: *Provided,* That this requirement does not apply when the water of condensation from the heaters is led to an observation tank or is not used for boiler-feed water. Heaters may be installed in double-bottoms, if so desired, when vessels are operating in cold waters and may be placed in the most convenient location for heating the oil.

(e) Fuel-oil pumps supplying oil to the burners, also oil strainers, shall be in duplicate, and the discharge of each pump shall be fitted with an efficient relief valve that will return surplus oil to the suction side of the pumps.

(f) Throttle valves on fuel-oil pumps shall be arranged so that they may be operated from some accessible point outside of the pump-room or fireroom inclosure.

§ 68.05–30 Vent piping.

(a) The vent pipes from all fuel-oil tanks shall have a net cross-sectional area equal to that of the filling pipes and shall be led from the top of the tank to the open air in a space where no danger will result from the discharge of oil vapor; the discharge ends to be fitted

with U-bends and a gauze diaphragm, which can be easily removed for cleaning.

(b) Where it is necessary to use bends in the piping, such bends shall not exceed 45 degrees from the vertical.

§ 68.05–35 Sounding pipes.

(a) Sounding pipes or other reliable apparatus shall be fitted to fuel tanks for use in determining the oil level in each tank. Sounding pipes shall be led up through the deck and down to within one diameter of the bottom of the tank, and shall not be perforated.

(b) Sounding pipes in the machinery spaces that do not extend up through a deck shall be fitted with a valve or stopcock that will close automatically to prevent oil overflow.

§ 68.05–40 Welded piping.

(a) Fusion butt welding may be used to join bilge, ballast, fuel-oil overflow, fuel-oil transfer and vent pipes, fire and flushing mains, fresh water distribution, brine piping, and drain suctions from fuel-oil tanks.

(b) Heating coils in fuel-oil tanks may also be joined by fusion welding, provided butt welds are used and the welds protected by a sleeve, fillet welded at the ends of the wall of the pipe.

(c) In all cases, such welding shall comply with the requirements of Subchapter F (Marine Engineering) of this chapter.

PART 69—INSTALLATIONS, TESTS, INSPECTIONS, AND REPAIRS

Subpart 69.01—Installations

Sec.

69.01–1 Protection of adjacent structure.
69.01–5 Dampers.

Subpart 69.05—Tests and Inspections

69.05–1 Test and inspection of new boilers.
69.05–5 Nameplates.
69.05–10 Tests and inspection of boilers and main steam piping in service.
69.05–15 Donkey boilers.
69.05–20 Inspection of foreign-built boilers admitted to American Registry.
69.05–25 Inspection of boilers on existing barges.

Subpart 69.10—Repairs

69.10–1 Welding repairs.

AUTHORITY: The provisions of this Part 69 issued under R.S. 4405, as amended, 4462, as amended; 46 U.S.C. 375, 416. Interpret or apply R.S. 4399, as amended, 4400, as amended, 4417, as amended, 4417a, as amended, 4418, as amended, 4421, as amended, 4426–4431, as amended, 4433, as amended, 4434, as amended, 4453, as amended, 4488, as amended, 4491, as amended, sec. 14, 29 Stat. 690, as amended, sec. 10, 35 Stat. 428, as amended, 41 Stat. 305, as amended, secs. 1, 2, 49 Stat. 1544, 1545, as amended, sec. 17, 54 Stat. 166, as amended, sec. 3, 54 Stat. 347, as amended, sec. 3, 70 Stat. 152, sec. 3, 68 Stat. 675; 46 U.S.C. 361, 362, 391, 391a, 392, 399, 404–409, 411, 412, 435, 481, 489, 366, 395, 363, 367, 526p, 1333, 390b, 50 U.S.C. 198; E.O. 11239, July 31, 1965, 30 F.R. 9671, 3 CFR, 1965 Supp. Treasury Department Orders 120, July 31, 1950, 15 F.R. 6521; 167–14, Nov. 26, 1954, 19 F.R. 8026; 167–20, June 18, 1956, 21 F.R. 4894; CGFR 56–28, July 24, 1956, 21 F.R. 5659; 167–38, Oct. 26, 1959, 24 F.R. 8857.

Subpart 69.01—Installations

§ 69.01–1 Protection of adjacent structure.

(a) Externally heated boilers shall have a clear space between the boiler and the woodwork of not less than 6 inches at the sides and 4 inches at the top.

(b) Internally heated boilers shall have a clear space between the boiler and the woodwork of not less than 4 inches at the sides and 4 inches at the top.

(c) All woodwork or other ignitible substance approaching within 12 inches of the boiler or smokestack (unless such boiler or smokestack is covered with good nonconducting material) shall be suitably sheathed with metal over noncombustible material and all woodwork or other ignitible substance in or around the fireroom shall be properly protected by metal or asbestos sheathing.

(d) All boilers hereafter placed in wooden steamers shall have a clear space of at least 8 inches between the underside of the cylindrical shell and the floor or keelson; and on all other steamers the boilers shall be so placed as to permit of proper inspection of the underside thereof.

(e) All water-tube or coil boilers shall have a clear space of not less than 4 inches between the back end of boiler and bulkhead. All other boilers shall have a clear space of not less than 2 feet between the back end of boiler and bulkhead.

(f) Where fuel-oil tanks are fitted in wooden vessels, lead pans or lining shall be placed under the tanks, the lead to be of a gage weighing not less than 8 pounds per square foot, this precaution being made to prevent oil from getting into the bilges of the vessel.

(g) Suitable drip pans shall be installed to catch the drip from burners, fuel-oil pumps, strainers, or any other place where necessary to prevent oil from reaching the bilges of the vessel.

(h) The boiler room and funnel casings shall be insulated so as to prevent the spread of fire to woodwork or other combustible material adjacent to the casings in the event of an oil fire taking place in the fireroom.

§ 69.01–5 Dampers.

(a) Dampers in funnels or uptakes on oil-burning steamers shall be fitted with a locking device in open position.

Subpart 69.05—Tests and Inspections

§ 69.05–1 Test and inspection of new boilers.

(a) All coil and pipe hereafter made, when such boiler is completed and ready for inspection, shall be subjected at the first inspection to a hydrostatic pressure at a ratio of 150 pounds to a steam pressure of 100 pounds.

§ 69.05–5 Nameplates.

(a) There shall be fastened to each boiler a plate containing the name of the manufacturer of the material, the place where manufactured, the tensile strength, the name of the builder of the boiler, when and where built.

(b) The date of the building of the boiler or boilers shall be determined by the month and year of issue of the first certificate of inspection which covers the boiler or boilers in question: *Provided*, That the boiler or boilers have not been used for any purpose previous to the inspection.

§ 69.05–10 Tests and inspection of boilers and main steam piping in service.

(a) The hydrostatic pressure applied to boilers which can be satisfactorily examined internally shall be in the proportion of 125 pounds to the square inch to 100 pounds to the square inch of the steam pressure allowed; types of boilers which due to design cannot be examined internally shall be subjected to a hydrostatic pressure in the proportion of 150 pounds to the square inch to 100 pounds to the square inch of the steam pressure allowed. The inspector, after applying the hydrostatic test, shall thoroughly examine every part of the boiler. The hydrostatic pressure shall also be applied to the main steam pipe up to the throttle.

(b) In the application of the hydrostatic pressure to boilers, inspectors shall require such arrangements as will guard against main and auxiliary stop valves being subjected to hydrostatic pressure on one side at the same time that steam pressure is exerted on the opposite side.

(c) Steamers on going out of service or laying up in winter quarters and beginning the annual inspection may have the hydrostatic pressure applied to boilers at any time preceding the date of the final completion of the inspection, so that, however, in no instance shall the vessel be navigated to exceed 12 months without the hydrostatic pressure.

(d) Inspectors are required at each annual inspection to carefully inspect the flues of every boiler and subject them to the hammer test where possible or practicable in order that deterioration of material may be detected. If such test indicates thin material, the doubtful place shall be drilled and the material carefully gaged in order that the safe pressure may be determined; or if the flue is found to deviate from the form of a practically true circle, the pressure shall be reduced accordingly. The efficiency and workmanship of the riveted seams shall also be carefully observed at all inspections.

(e) The Officer in Charge, Marine Inspection, in determining the distance between the flues and the shells of externally fired boilers, under provisions of R. S. 4434 (46 U. S. C. 412), shall take the measurements from the plate in the flue to the plate in the shell on vessels in river service only.

(f) The shell of any boiler which has reached the age of 10 years shall, at the first annual inspection thereafter, and at such subsequent periods as the Officer in Charge, Marine Inspection, or Coast Guard District Commander may deem necessary, be drilled near the water line and at such other points in the shell as

may be necessary to determine as nearly as possible the thickness of material, which ascertained thickness, together with the general condition of the boiler, shall govern the maximum allowable pressure. If the thickness found by actual measurement is less than the original thickness, the maximum allowable pressure shall be recalculated using the thinnest portion of the shell plate as the thickness of the shell, and shall not exceed the maximum pressure permitted by the applicable boiler design formulas. For the purpose of such recalculation, the design formulas specified in this subchapter may be used for boilers made or contracted for prior to July 1, 1935, or alternatively the design formulas set forth in Subchapter F (Marine Engineering) may be used.

§ 69.05–15 Donkey boilers.

Donkey boilers shall be inspected in the same manner as the main boilers.

§ 69.05–20 Inspection of foreign-built boilers admitted to American Registry.

(a) Boilers of foreign-built vessels admitted to American registry shall be inspected in the same manner as boilers on American vessels.

(b) The working steam pressure shall be determined by the application of the hydrostatic pressure in the ratio as required by the laws of the United States and by a close observation of the general condition of the boiler.

(c) The working steam pressure under which the boilers are being operated shall be accepted as the basis for determining the allowable working pressure where it is not practicable or possible to secure a record of the tests of the plates entering into the construction of the boiler.

§ 69.05–25 Inspection of boilers on existing barges.

Boilers on existing barges required to be inspected and not constructed according to the specifications prescribed by the Commandant may be considered the same as foreign-built boilers as specified in § 69.05–20, and so treated.

Subpart 69.10—Repairs

§ 69.10–1 Welding repairs.

(a) No repair work by any welding process other than fusion welding shall be allowed on main boilers or unfired pressure vessels until coupons showing the character of the work proposed to be done by the applicant shall have been tested and submitted, with an explanation and report of the test, to the Officer in Charge, Marine Inspection, at or nearest the place where the work is to be done. The Officer in Charge, Marine Inspection, shall then satisfy himself whether or not such process can be used with safety on the boilers or unfired pressure vessels of steam vessels.

(b) In every case where repairs are to be made by these processes on boilers or unfired pressure vessels of steam vessels subject to the inspection of the Coast Guard, the engineer in charge and the parties making the repairs are required to notify the Officer in Charge, Marine Inspection, giving full detailed description of the repairs to be made, the location of the vessel, and the time the repairs are to be begun, so that inspection may be had, if practicable, prior to and during the time the work is being done, which reports must be confirmed in writing to the Officer in Charge, Marine Inspection.

(c) The application for permission to use these processes on boiler or unfired pressure vessel repairs of any particular vessel implies a guaranty on the part of the applicant that the work shall, in material, flux, and workmanship, be equal to that of the samples furnished.

(d) Repairs to marine boilers and unfired pressure vessels by means of fusion welding may be permitted provided such welding conforms to the requirements of Subchapter F (Marine Engineering) of this chapter.

SUBCHAPTER H—PASSENGER VESSELS

PART 70—GENERAL PROVISIONS

Subpart 70.01—Authority and Purpose

Sec.

70.01–1 Purpose of regulations.
70.01–5 Assignment of functions.
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Subpart 70.05—Application

70.05–1 United States flag vessels subject to the requirements of this subchapter.
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70.05–5 Specific application noted in text.
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Subpart 70.10—Definition of Terms Used in This Subchapter

70.10–1 Approved.
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70.10–3 Carrying passengers for hire.
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70.10–7 Classed vessel.
70.10–9 Commandant.
70.10–11 Coast Guard District Commander.
70.10–13 Coastwise.
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70.10–21 International voyage.
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70.10–25 Marine inspector or inspector.
70.10–29 Motor vessel.
70.10–30 Nuclear vessel.
70.10–31 Ocean.
70.10–33 Officer in Charge, Marine Inspection.
70.10–35 Passenger.
70.10–37 Rules of the Road.
70.10–39 Rivers.
70.10–41 Recognized classification society.
70.10–42 Sailing vessel.
70.10–43 Short international voyage.
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Subpart 70.15—Equivalents

70.15–1 Conditions under which equivalents may be used.

Subpart 70.20—General Marine Engineering Requirements

Sec.

70.20–1 Marine engineering details.
70.20–5 Nuclear vessels.

Subpart 70.25—General Electrical Engineering Requirements

70.25–1 Electrical engineering details.

Subpart 70.30—Special Provisions

70.30–1 Vessels acquired or documented under the act of Aug. 9, 1954.
70.30–5 Installations of equipment made during the unlimited national emergency declared by the President on May 27, 1941.

Subpart 70.35—American Bureau of Shipping's Standards

70.35–1 Standards to be used.
70.35–5 Where obtainable.

AUTHORITY: The provisions of this Part 70 issued under R.S. 4405, as amended, 4462, as amended; 46 U.S.C. 375, 416. Interpret or apply R.S. 4399, as amended, 4400, as amended, 4421, as amended, 4426, as amended, 4453, as amended, 4488, as amended, sec. 10, 35 Stat. 428, as amended, 41 Stat. 305, as amended, sec. 5, 49 Stat. 1384, as amended, secs. 1, 2, 49 Stat. 1544, 1545, as amended, sec. 17, 54 Stat. 166, as amended, sec. 3, 54 Stat. 347, as amended, sec. 3, 70 Stat. 152, sec. 3, 68 Stat. 675; 46 U.S.C. 361, 362, 404, 399, 435, 481, 366, 395, 363, 367, 526p, 1333, 390b, 50 U.S.C. 198; E.O. 11239, July 31, 1965, 30 F.R. 9671, 3 CFR, 1965 Supp. Treasury Department Orders 120, July 31, 1950, 15 F.R. 6521; 167–14, Nov. 26, 1954, 19 F.R. 8026; 167–20, June 18, 1956, 21 F.R. 4894; CGFR 56–28, July 24, 1956, 21 F.R. 5659; 167–38, Oct. 26, 1959, 24 F.R. 8857, unless otherwise noted.

Subpart 70.01—Authority and Purpose

§ 70.01–1 Purpose of regulations.

(a) The purpose of the regulations in this subchapter is to set forth uniform minimum requirements for passenger vessels in accordance with the intent of Title 52 of the Revised Statutes and acts amendatory thereof or supplemental thereto, as well as to implement various International Conventions for Safety of Life at Sea and other treaties which affect the merchant marine. The regulations are necessary to carry out the provisions of law affecting passenger vessels and such regulations have the force of law.

§ 70.01–5 Assignment of functions.

(a) By Reorganization Plan No. 3 of 1946, effective July 16, 1946, the marine inspection functions of the former Bureau of Marine Inspection and Navigation and its officers and employees were transferred to the Commandant, United States Coast Guard. By Reorganization Plan No. 26 of 1950 (15 F. R. 4935; 3 CFR, 1950 Supp., p. 178; 5 U. S. C. Note under 241), effective July 31, 1950, the functions formerly vested in the Commandant, United States Coast Guard, were transferred to the Secretary of the Treasury with certain specified exceptions. The Secretary of the Treasury by an order dated July 31, 1950 (15 F. R. 6521), delegated to the Commandant the functions formerly performed by him under Reorganization Plan No. 3 of 1946.

§ 70.01–10 Authority for regulations.

(a) *General.* (1) The authority to prescribe regulations generally is set forth in 46 U.S. Code, sections 375 and 416, as well as in certain other provisions in 46 U.S. Code, sections 170, 214, 215, 222, 224, 224a, 226, 228, 229, 230–234, 239, 240, 361, 362, 364, 372, 381, 391, 391a, 392, 393, 399, 400, 402–414, 435, 436, 451–453, 460, 461, 462, 464, 467, 470–482, and 489–498, and acts amendatory thereof or supplemental thereto. Under the provisions of 46 U.S. Code, section 372, the Commandant, United States Coast Guard, superintends the administration of the vessel inspection laws to produce a correct and uniform administration of the inspection laws, rules, and regulations.

(b) *Inspection and certification.* (1) The regulations regarding inspection and certification of passenger vessels interpret or apply 46 U.S. Code, sections 361, 362, 363, 367, 369, 390b, 391, 392, 395, 399, 400, 404, 406–408, 411, 412, 435, 660a, and 1333, and 50 U.S. Code, section 198.

(c) *Construction and arrangement.* (1) The regulations regarding the construction and arrangement of passenger vessels interpret or apply 46 U.S. Code, sections 363, 367, 369, 390b, 391, 392, 404, 481–483, and 1333, and 50 U.S. Code, section 198.

(d) *Subdivision.* (1) The regulations regarding subdivision of passenger vessels interpret or apply 46 U.S. Code, sections 85a, 88a, 363, 367, 369, 390b, 391, 392, 404, 482, 483, and 1333 and 50 U.S. Code, section 198.

(e) *Stability.* (1) The regulations regarding stability of passenger vessels interpret or apply 46 U.S. Code, sections 85a, 88a, 363, 367, 369, 390b, 391, 392, 404, 482, 483, and 1333, and 50 U.S. Code, section 198.

(f) *Lifesaving equipment.* (1) The regulations regarding lifesaving equipment of passenger vessels interpret or apply 46 U.S. Code, sections 367, 390b, 391, 392, 404, 481, 489, 526p, and 1333, and 50 U.S. Code, section 198.

(g) *Fire protection and equipment.* (1) The regulations regarding fire protection equipment of passenger vessels interpret or apply 46 U.S. Code, sections 367, 390b, 391, 392, 404, 470, 481, 526p, and 1333, and 50 U.S. Code, section 198.

(h) *Vessel control and miscellaneous systems and equipment.* (1) The regulations regarding vessel control and miscellaneous systems and equipment of passenger vessels interpret or apply 46 U.S. Code, sections 363, 367, 390b, 391, 392, 404, 526p, and 1333, and 50 U.S. Code, section 198.

(i) *Operations.* (1) The regulations regarding operations of passenger vessels interpret or apply 46 U.S. Code, sections 367, 390b, 391, 392, 404, 435, 526p, and 1333, and 50 U.S. Code, section 198.

Subpart 70.05—Application

§ 70.05–1 United States flag vessels subject to the requirements of this subchapter.

(a) This subchapter shall be applicable to all United States flag vessels indicated in Column 4 of Table 70.05–1(a) that are 100 gross tons or more, except as follows:

(1) Any vessel operating exclusively on inland waters which are not navigable waters of the United States; or,

(2) Any vessel while laid up and dismantled and out of commission; or,

(3) With the exception of vessels of the U. S. Maritime Administration, any vessel with title vested in the United States and which is used for public purposes.

§ 70.05–3 Foreign vessels subject to the requirements of this subchapter.

(a) Except as specifically noted in paragraph (b) of this section, this subchapter shall be applicable to the extent prescribed by law to all foreign vessels of the following classifications indicated in Column 4 of Table 70.05–1(a) that are 100 gross tons or more:

(1) Foreign vessels which carry more than 12 passengers from any port in the United States; or,

(2) Foreign vessels, other than those mentioned in subparagraph (1) of this paragraph, which carry more than 6 passengers from any port in the United States, and which are:

(i) Mechanically propelled vessels of not more than 15 gross tons; or,

(ii) Sailing vessels of not more than 700 gross tons; or,

(iii) Nonself-propelled vessels of not more than 100 gross tons.

(b) The provisions of this subchapter shall not be applicable to those foreign vessels covered by paragraph (a) of this section which are:

(1) Any vessel of a foreign nation signatory to the International Convention for Safety of Life at Sea, 1960, and which has on board a current valid safety certificate; or,

(2) Any vessel of a foreign nation having inspection laws approximating those of the United States together with reciprocal inspection arrangements with the United States, and which has on board a current valid certificate of inspection issued by its government under such arrangements.

(c) Notwithstanding the exceptions previously noted in paragraph (b) of this section, foreign vessels of novel design or construction, or whose operation involves potential unusual risks shall be subject to inspection to the extent necessary to safeguard life and property in United States' ports, as further provided by § 2.01–13 of Subchapter A (Procedures Applicable to the Public) of this chapter.

(R.S. 4472, as amended; 46 U.S.C. 170)

§ 70.05–5 Specific application noted in text.

(a) At the beginning of the various parts, subparts, and sections, a more specific application is generally given for the particular portion of the text involved. This application sets forth the types, sizes, or services or vessels to which the text pertains, and in many cases limits the application of the text to vessels contracted for before or after a specific date. As used in this subchapter, the term "vessels contracted for" includes not only the contracting for the construction of a vessel, but also the contracting for a material alteration to a vessel, the contracting for the conversion of a vessel to a passenger vessel, and the changing of service or route of a vessel if such change increases or modifies the general requirements for the vessel or increases the hazards to which it might be subjected.

§ 70.05–7 Ocean or unlimited coastwise vessels on inland and Great Lakes Routes.

(a) Vessels inspected and certificated for ocean or unlimited coastwise routes shall be considered suitable for navigation insofar as the provisions of this subchapter are concerned on any inland route, including the Great Lakes.

§ 70.05–10 Application to vessels on an international voyage.

(a) Where, in various places or portions of this subchapter, requirements are stipulated specifically for "vessels on an international voyage", it is intended that these requirements apply only to vessels subject to the International Convention for Safety of Life at Sea, 1960, which are mechanically propelled on an international voyage as defined in § 70.10–21, and certificated to carry more than 12 passengers.

(b) In accordance with Regulation 4, Chapter I (General Provisions), of the International Convention for Safety of Life at Sea, 1960, a vessel which is not normally engaged on an international voyage but which, in exceptional circumstances, is required to undertake a single international voyage may be exempted by the Commandant from any of the requirements of the Regulations of the Convention: *Provided*, That it complies with safety requirements which are adequate in his opinion for the voyage which is to be undertaken.

(c) In accordance with Regulation 1(c), Chapter II (Construction), of the International Convention for Safety of Life at Sea, 1960, the Commandant may, if he considers that the sheltered nature and conditions of the voyage are such as to render the application of any specific requirements of Chapter II of this Convention unreasonable or unnecessary, exempt from those requirements individual vessels or classes of vessels which, in the course of their voyage, do not proceed more than 20 miles from the nearest land.

(d) In accordance with Regulation 3(a), Chapter III (Lifesaving Appliances, Etc.), of the International Convention for Safety of Life at Sea, 1960, the Commandant, if he considers that the sheltered nature and conditions of the voyage are such as to render the application of the full requirements of Chapter III of this Convention unreasonable or unnecessary, may to that extent exempt from the requirements of Chapter III individual vessels or classes of vessels which, in the course of their voyage, do not go more than 20 miles from the nearest land.

TABLE 70.05-1(a)

Method of propulsion	Size or other limitations [1]	Classes of vessels (including motorboats) examined or inspected under various Coast Guard regulations [1]			
		Vessels inspected and certificated under Subchapter D—Tank Vessels [2]	Vessels inspected and certificated under either Subchapter H—Passenger Vessels [2] [3] [4] or Subchapter T—Small Passenger Vessels [2] [4]	Vessels inspected and certificated under Subchapter I—Cargo and Miscellaneous Vessels [2] [5]	Vessels subject to provisions of Subchapter C—Uninspected Vessels [2] [4]
Column 1	Column 2	Column 3	Column 4	Column 5	Column 6
Steam	Vessels not over 65 feet in length.	All vessels carrying combustible or flammable liquid cargo in bulk.	All vessels carrying more than 6 passengers.[7]	All tugboats and towboats.	All vessels except those covered by columns 3, 4, and 5.[8]
	Vessels over 65 feet in length.	All vessels carrying combustible or flammable liquid cargo in bulk.[6]	1. All vessels carrying more than 12 passengers on an international voyage, except yachts. 2. All vessels of not over 15 gross tons which carry more than 6 passengers.[7] 3. All other vessels carrying passengers, except: a. Yachts. b. Documented cargo or tank vessels issued a permit to carry not more than 16 persons in addition to the crew. c. Towing and fishing vessels, in other than ocean and coastwise service, may carry persons on the legitimate business of the vessel, in addition to crew, but not to exceed one for each net ton of the vessel.	All vessels except those covered by columns 3 and 4.	None.
Motor	Vessels of not over 15 gross tons.	All vessels carrying combustible or flammable liquid cargo in bulk.	All vessels carrying more than 6 passengers.[7]	Those vessels carrying dangerous cargoes when required by 46 CFR Part 98 or 146.	All vessels except those covered by columns 3, 4, and 5.
	Vessels over 15 gross tons except seagoing motor vessels of 300 gross tons and over.	All vessels carrying combustible or flammable liquid cargo in bulk.[6]	1. All vessels carrying more than 12 passengers on an international voyage, except yachts. 2. All vessels not over 65 feet in length which carry more than 6 passengers.[7] 3. All other vessels of over 65 feet in length carrying passengers for hire except documented cargo or tank vessels issued a permit to carry not more than 16 persons in addition to the crew.	All vessels carrying freight for hire except those covered by columns 3 and 4.	All vessels except those covered by columns 3, 4, and 5.
	Seagoing motor vessels of 300 gross tons and over.	All vessels carrying combustible or flammable liquid cargo in bulk.[6]	1. All vessels carrying more than 12 passengers on an international voyage, except yachts. 2. All other vessels carrying passengers, except: a. Yachts. b. Documented cargo or tank vessels issued a permit to carry not more than 16 persons in addition to the crew.	All vessels except those covered by columns 3 and 4, and those engaged in the fishing, oystering, clamming, crabbing, or any other branch of the fishery, kelp, or sponge industry.	All vessels except those covered by columns 3, 4, and 5.
Sail	Vessels not over 700 gross tons.	All vessels carrying combustible or flammable liquid cargo in bulk.	All vessels carrying more than 6 passengers.[7]	Those vessels carrying dangerous cargoes when required by 46 CFR Part 98 or 146.	None.
	Vessels over 700 gross tons.	All vessels carrying combustible or flammable liquid cargo in bulk.	All vessels carrying passengers for hire.	Those vessels carrying dangerous cargoes when required by 46 CFR Part 98 or 146.	None.
Nonself-propelled	Vessels not over 100 gross tons.	All vessels carrying combustible or flammable liquid cargo in bulk.	All vessels carrying more than 6 passengers.[7]	Those vessels carrying dangerous cargoes when required by 46 CFR Part 98 or 146.	All barges carrying passengers except those covered by column 4.
	Vessels over 100 gross tons.	All vessels carrying combustible or flammable liquid cargo in bulk.	All vessels carrying passengers for hire.	All seagoing barges except those covered by columns 3 and 4; and those inland barges carrying dangerous cargoes when required by 46 CFR Part 98 or 146.	All barges carrying passengers except those covered by column 4.

[1] Where length is used in this table it means the length measured from end to end over the deck, excluding sheer. This expression "means a straight line measurement of the overall length from the foremost part of the vessel to the aftermost part of the vessel, measured parallel to the centerline."

[2] Subchapters E (Load Lines), F (Marine Engineering), J (Electrical Engineering), and N (Dangerous Cargoes) of this chapter may also be applicable under certain conditions.

[3] Public nautical schoolships, other than vessels of the Navy and Coast Guard, shall meet the requirements of Part 167 of Subchapter R (Nautical Schools) of this chapter. Civilian nautical schoolships, as defined by 46 U.S.C. 1331, shall meet the requirements of Subchapter H (Passenger Vessels) and Part 168 of Subchapter R (Nautical Schools) of this chapter.

[4] Subchapter H (Passenger Vessels) of this chapter covers only those vessels of 100 gross tons or more. Subchapter T (Small Passenger Vessels) of this chapter covers only those vessels of less than 100 gross tons.

[5] Vessels covered by Subchapters H (Passenger Vessels) or I (Cargo and Miscellaneous Vessels) of this chapter, where the principal purpose or use of the vessel is not for the carriage of liquid cargo, may be granted a permit to carry a limited amount of flammable or combustible liquid cargo in bulk. The portion of the vessel used for the carriage of the flammable or combustible liquid cargo shall meet the requirements of Subchapter D (Tank Vessels) in addition to the requirements of Subchapter H (Passenger Vessels) or I (Cargo and Miscellaneous Vessels) of this chapter.

[6] Any vessel on an international voyage is subject to the requirements of the International Convention for Safety of Life at Sea, 1960.

[7] The meaning of the term "passenger" is as defined in the Act of May 10, 1956 (sec. 1, 70 Stat. 151; 46 U.S.C. 390).

[8] Boilers and machinery are subject to examination on vessels over 40 feet in length.

§ 70.05–15 Vessels subject to the act of May 10, 1956.

(a) The act of May 10, 1956 (46 U.S.C. 390–390g), applies to vessels which carry more than 6 passengers and which are:

(1) Mechanically propelled vessels of not more than 15 gross tons; or,

(2) Sailing vessels of not more than 700 gross tons; or,

(3) Nonself-propelled vessels of not more than 100 gross tons.

(b) Except as further set forth in this section, all vessels subject to the Act of May 10, 1956, shall meet all of the applicable requirements of this subchapter except that the Certificate of Inspection issued to the vessel shall be valid for a period of three years in lieu of one year, and reinspection will be made annually between inspections for certification.

(c) Vessels in existence as passenger vessels before June 1, 1958, and vessels contracted for as passenger vessels prior to June 1, 1958, which are subject to the act of May 10, 1956, shall meet the applicable requirements of this subchapter insofar as is reasonable and practicable in the opinion of the Officer in Charge, Marine Inspection. In this respect, he may grant departures from specific requirements of this subchapter if in his opinion the circumstances warrant such departure. In any case, the Officer in Charge, Marine Inspection, shall satisfy himself that the vessel and its equipment are in good condition and satisfactory for the purpose intended.

§ 70.05–20 Gross tonnage as a criterion for requirements.

(a) The regulations in this subchapter, as well as referenced requirements in other subchapters in this chapter, take into account the passenger vessel's size, construction, and equipment, as well as its intended service on the routes or waters on which it is desired to be operated or navigated, which are indications of the hazards to which such vessel may be subjected. The Commandant's determinations in this respect for a particular passenger vessel are stipulated in a certificate of inspection, which states certain terms and conditions governing such vessel when in operation.

(b) In applying the laws and regulations to passenger vessels, one criterion for invocation of safety standards is the description of passenger vessels by relative size in gross tons. When it is determined by the Commandant that the gross register tonnage for a particular passenger vessel, which is attained by exemptions, reductions, or other devices in the basic gross tonnage formulation, will circumvent or be incompatible with the application of specific safety requirements in the passenger vessel regulations for a vessel of such physical size, the Commandant shall prescribe the regulations to be made applicable to such vessel.

(c) When the Commandant determines that the gross register tonnage is not a valid criterion for the invocation of safety requirements based on relative size, the parties involved will be informed of the determination and of the regulations applicable to such passenger vessel, and before being permitted to operate such vessel, compliance therewith shall be required. Endorsements or notations on the passenger vessel's certificate of inspection may be made as appropriate.

§ 70.05–25 Portable containers—interpretive rulings.

(a) The phrase "drums, barrels, or other packages," as used in R.S. 4417a, as amended (46 U.S.C. 391a), and in R.S. 4472, as amended (46 U.S.C. 170), is interpreted to mean portable containers having a maximum capacity of 110 U.S. gallons and ICC specification cylinders having a water capacity of not more than 1,000 pounds, which are actually loaded and discharged from vessels with their contents intact.

(b) The phrase "inflammable or combustible liquid cargo in bulk" as used in R.S. 4417a, as amended (46 U.S.C. 391a), and in R.S. 4472, as amended (46 U.S.C. 170), is interpreted to include such cargo in portable containers of a capacity of more than 110 U.S. gallons.

(c) The phrase "liquid cargo" as used in R.S. 4417a, as amended (46 U.S.C. 391a), is interpreted to mean flammable or combustible liquids.

(Interpret or apply R.S. 4417a, as amended, 4472, as amended; 46 U.S.C. 391a, 170)

Subpart 70.10—Definition of Terms Used in This Subchapter

§ 70.10–1 Approved.

This term means approved by the Commandant unless otherwise stated.

§ 70.10–2 Barge.

This term means any nonself-propelled vessel.

§ 70.10–3 Carrying passengers for hire.

The carriage of any person or persons by a vessel for a valuable consideration, whether directly or indirectly flowing to the owner, charterer, operator, agent or any other person interested in the vessel.

§ 70.10–5 Carrying freight for hire.

The carriage of any goods, wares, or merchandise or any other freight for a valuable consideration whether directly or indirectly flowing to the owner, charterer, operator, agent, or any other person interested in the vessel.

§ 70.10–7 Classed vessel.

This term means any vessel classed by the American Bureau of Shipping or other recognized classification society.

§ 70.10–9 Commandant.

This term means the Commandant of the Coast Guard.

§ 70.10–11 Coast Guard District Commander.

This term means an officer of the Coast Guard designated as such by the Commandant to command all Coast Guard activities within his district, which include the inspection, enforcement, and administration of Title 52, Revised Statutes, and acts amendatory thereof or supplemental thereto, and rules and regulations thereunder.

§ 70.10–13 Coastwise.

Under this designation shall be included all vessels normally navigating the waters of any ocean or the Gulf of Mexico 20 nautical miles or less offshore.

§ 70.10–15 Ferry.

Under this designation shall be included those vessels, in other than ocean or coastwise service, having provisions only for deck passengers and/or vehicles, operating on a short run on a frequent schedule between 2 points over the most direct water route, and offering a public service of a type normally attributed to a bridge or tunnel.

§ 70.10–17 Great Lakes.

Under this designation shall be included all vessels navigating the Great Lakes.

§ 70.10–19 Headquarters.

This term means the Office of the Commandant, United States Coast Guard, Washington, D.C., 20226.

§ 70.10–21 International voyage.

(a) The term "international voyage" as used in this subchapter shall have the same meaning as that contained in Regulation 2(d), Chapter I of the International Convention for Safety of Life at Sea, 1960, i.e., " 'International voyage' means a voyage from a country to which the present Convention applies to a port outside such country, or conversely; and for this purpose every territory for the international relations of which a Contracting Government is responsible or for which the United Nations is the administering authority is regarded as a separate country."

(b) The International Convention for Safety of Life at Sea, 1960, does not apply to vessels "solely navigating the Great Lakes of North American and the River St. Lawrence as far east as a straight line drawn from Cap de Rosiers to West Point, Anticosti Island and, on the north side of Anticosti Island, the 63d Meridian." Accordingly, such vessels shall not be considered as being on an "international voyage" for the purpose of this subchapter.

(c) For the purposes of this subchapter the term "territory" as used in paragraph (a) of this section shall be considered to include the Commonwealth of Puerto Rico, the Canal Zone, all possessions of the United States, and all lands held by the United States under a protectorate or mandate.

(d) In addition, although voyages between the continental United States and Hawaii or Alaska, and voyages between Hawaii and Alaska are not "international voyages" under the provisions of the International Convention for Safety of Life at Sea, 1960, such voyages are similar in nature and shall be considered as "international voyages" and subject to the same requirements for the purposes of this subchapter.

§ 70.10–23 Lakes, bays, and sounds.

Under this designation shall be included all vessels navigating the waters of any of the lakes, bays, or sounds other than the waters of the Great Lakes.

§ 70.10–25 Marine inspector or inspector.

These terms mean any person from the civilian or military branch of the Coast Guard assigned under the superintendence and direction of an Officer in Charge, Marine Inspection, or any other person as may be designated for the performance of duties with respect to the inspection, enforcement, and administration of Title 52, Revised Statutes, and acts amendatory thereof or supplemental thereto, and rules and regulations thereunder.

§ 70.10–29 Motor vessel.

This term means any vessel more than 65 feet in length, which is propelled by machinery other than steam.

§ 70.10–30 Nuclear vessel.

(a) A nuclear vessel is a vessel provided with a nuclear powerplant for propulsion or any other purpose, or any vessel handling or processing substantial amounts of radioactive material other than as cargo.

§ 70.10–31 Ocean.

Under this designation shall be included all vessels navigating the waters of any ocean or the Gulf of Mexico more than 20 nautical miles offshore.

§ 70.10–33 Officer in Charge, Marine Inspection.

This term means any person from the civilian or military branch of the Coast Guard designated as such by the Commandant and who, under the superintendence and direction of the Coast Guard District Commander, is in charge of an inspection zone for the performance of duties with respect to the inspections, enforcement, and administration of Title 52, Revised Statutes, and acts amendatory thereof or supplemental thereto, and rules and regulations thereunder.

§ 70.10–35 Passenger.

A passenger is every person other than the master and the members of the crew or other persons employed or engaged in any capacity on board a vessel in the business of that vessel. The following special considerations should be noted:

(a) In the case of a vessel on an international voyage a child under one year of age is not counted as a passenger.

(b) For vessels subject to the provisions of the act of May 10, 1956, the term "passenger" means every person carried on board a vessel other than:

(1) The owner or his representative;

(2) The master and the bona fide members of the crew engaged in the business of the vessel who have contributed no consideration for their carriage and who are paid for their services;

(3) Any employee of the owner of the vessel engaged in the business of the owner, except when the vessel is operating under a bareboat charter;

(4) Any employee of the bareboat charterer of the vessel engaged in the business of the bareboat charterer;

(5) Any guest on board a vessel which is being used exclusively for pleasure purposes who has not contributed any consideration directly or indirectly, for his carriage; or,

(6) Any person on board a vessel documented and used for tugboat or towboat service of fifty gross tons or more who has not contributed any consideration, directly or indirectly, for his carriage.

§ 70.10–37 Rules of the Road.

(a) The term "Rules of the Road" means the statutory and regulatory rules governing navigation of vessels. These rules are also published by the Coast Guard in pamphlet form as follows:

(1) Rules of the Road—International—Inland (CG–169).

(2) Rules of the Road—Great Lakes (CG–172).

(3) Rules of the Road—Western Rivers (CG–184).

(b) The current editions of the "Rules of the Road" pamphlets may be obtained from any Marine Inspection Office.

§ 70.10–39 Rivers.

Under this designation shall be included all vessels whose navigation is restricted to rivers and/or canals exclusively, and to such other waters as may be so designated by the Coast Guard District Commanders.

§ 70.10–41 Recognized classification society.

The term "recognized classification society" means the American Bureau of Shipping or other classification society recognized by the Commandant.

§ 70.10–42 Sailing vessel.

This term means a vessel with no mechanical means of propulsion, all propulsive power being provided by sails.

§ 70.10–43 Short international voyage.

For the purpose of this subchapter, the expression "short international voyage" means an international voyage in the course of which a vessel is not more than 200 miles from a port or place in which the passengers and crew could be placed in safety, and which does not exceed 600 miles in length between the last port of call in the country in which the voyage begins and the final port of destination.

§ 70.10–45 Vessel.

Where the word "vessel" is used in this subchapter, it shall be considered to include all vessels indicated in Column 4 of Table 70.05–1(a), which are of more than 65 feet in length measured from end to end over the deck excluding sheer, except as otherwise noted in this subpart.

§ 70.10–47 Western rivers.

For the purposes of this subchapter, the term "western rivers" is as defined in CG–184, "Rules of the Road—Western Rivers."

Subpart 70.15—Equivalents

§ 70.15–1 Conditions under which equivalents may be used.

(a) Where in this subchapter it is provided that a particular fitting, material, appliance, apparatus, or equipment, or type thereof, shall be fitted or carried in a vessel, or that any particular provision shall be made or arrangement shall be adopted, the Commandant may accept in substitution therefor any other fitting, material, apparatus, or equipment, or type thereof, or any other provision or arrangement: *Provided*, That he shall have been satisfied by suitable trials that the fitting, material, appliance, apparatus, or equipment, or type thereof, or the provision or arrangement shall be at least as effective as that specified in this subchapter.

(b) In any case where it is shown to the satisfaction of the Commandant that the use of any particular equipment, apparatus, or arrangement not specifically required by law is unreasonable or impracticable, the Commandant may permit the use of alternate equipment, apparatus, or arrangement to such an extent and upon such conditions as will insure, to his satisfaction, a degree of safety consistent with the minimum standards set forth in this subchapter.

Subpart 70.20—General Marine Engineering Requirements

§ 70.20–1 Marine engineering details.

All marine engineering details such as piping, valves, fittings, boilers, pressure vessels, etc., and their appurtenances installed on the vessel, shall be designed, constructed, and installed in accordance with the provisions of Subchapter F (Marine Engineering) of this chapter.

(R.S. 4418, as amended, 4433, as amended; 46 U.S.C. 392, 411)

§ 70.20–5 Nuclear vessels.

(a) Nuclear vessels shall comply with the applicable requirements in Subpart 57.30 of Part 57 of Subchapter F (Marine Engineering) of this chapter. The regulations covering the transportation and handling of radioactive materials as cargo are contained in Part 146 of Subchapter N (Dangerous Cargoes) of this chapter.

(R.S. 4417, as amended, 4418, as amended, 4472, as amended, sec. 2, 23 Stat. 118, as amended, secs. 2, 633, 63 Stat. 496, 545; 46 U.S.C. 391, 392, 170, 2, 14 U.S.C. 2, 633. Treasury Department Order 167–17, June 29, 1955, 20 F.R. 4976)

Subpart 70.25—General Electrical Engineering Requirements

§ 70.25–1 Electrical engineering details.

All electrical engineering details and installations shall be designed and in-

stalled in accordance with Subchapter J (Electrical Engineering) of this chapter.

(R.S. 4418, as amended; 46 U.S.C. 392)

Subpart 70.30—Special Provisions

§ 70.30–1 Vessels acquired or documented under the Act of August 9, 1954.

(a) Vessels acquired or documented under the act of August 9, 1954 (sec. 3, 68 Stat. 675; 50 U.S.C. 198), shall be subject to the applicable provisions of Title 52 of the Revised Statutes, acts amendatory thereof or supplemental thereto and the rules and regulations thereunder.

(b) Unapproved lifesaving, firefighting, and other equipment may be continued in service as long as, in the opinion of the Officer in Charge, Marine Inspection, such equipment is in good and serviceable condition. All replacements shall be in accordance with Coast Guard requirements.

§ 70.30–5 Installations of equipment made during the unlimited national emergency declared by the President on May 27, 1941.

(a) Boilers, pressure vessels, machinery, piping, electrical, and other installations, including lifesaving, firefighting, and other safety equipment, installed on vessels during the Unlimited National Emergency declared by the President on May 27, 1941, and prior to the determination of Title V of the Second War Powers Act, as extended (sec. 501, 56 Stat. 180, 50 U.S.C. App. 635), which do not fully meet the detailed requirements of the regulations in this chapter, may be continued in service if found to be satisfactory by the Commandant for the purpose intended.

Subpart 70.35—American Bureau of Shipping's Standards

AUTHORITY: The provisions of this Subpart 70.35 interpret or apply sec. 25, 41 Stat. 9938, as amended, sec. 5, 49 Stat. 1384, as amended; 46 U.S.C. 881, 369.

§ 70.35–1 Standards to be used.

(a) Where in this subchapter an item, or method of construction, or testing is required to meet the standards established by the American Bureau of Shipping, the current standards in effect at the time of construction of the vessel, or otherwise as applicable, shall be used. The current standards of other recognized classification societies may also be accepted upon approval by the Commandant.

§ 70.35–5 Where obtainable.

(a) The standards established by the American Bureau of Shipping are usually published annually and may be purchased from the American Bureau of Shipping, 45 Broad Street, New York, N.Y., 10004. These standards may be also examined at the office of the Commandant (M), U.S. Coast Guard, Washington, D.C., 20226, or at the office of any Coast Guard District Commander or Officer in Charge, Marine Inspection.

PART 71—INSPECTION AND CERTIFICATION

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AUTHORITY: The provisions of this Part 71 issued under R.S. 4405, as amended, 4462, as amended; 46 U.S.C. 375, 416. Interpret or apply R.S. 4399, as amended, 4400, as amended, 4417, as amended, 4418, as amended, 4421, as amended, 4426, as amended, 4433, as amended, 4453, as amended, 4488, as amended, 4490, as amended, 4491, as amended, sec. 14, 29 Stat. 690, as amended, sec. 10, 35 Stat. 428, as amended, 41 Stat. 305, as amended, sec. 5, 49 Stat. 1384, as amended, secs. 1, 2, 49 Stat. 1544, 1545, as amended, sec. 17, 54 Stat. 166, as amended, sec. 3, 54 Stat. 347, as amended, sec. 3, 70 Stat. 152, sec. 3, 68 Stat. 675; 46 U.S.C. 361, 362, 391, 392, 399, 404, 411, 435, 481, 482, 489, 366, 395, 363, 369, 367, 526p, 1333, 390b, 50 U.S.C. 198; E.O. 11239, July 31, 1965, 30 F.R. 9671, 3 CFR, 1965 Supp. Treasury Department Orders 120, July 31, 1950, 15 F.R. 6521; 167–14, Nov. 26, 1954, 19 F.R. 8026; 167–20, June 18, 1956, 21 F.R. 4894; CGFR 56–28, July 24, 1956, 21 F.R. 5659; 167–38, Oct. 26, 1959, 24 F.R. 8857, unless otherwise noted.

Subpart 71.01—Certificate of Inspection

AUTHORITY: The provisions of this Subpart 71.01 interpret or apply R.S. 4423, as amended, sec. 12, 35 Stat. 428, as amended; 46 U.S.C. 400, 397.

§ 71.01–1 When required.

(a) Except as noted in this subpart or Subpart 71.05, no vessel subject to inspection and certification shall be operated without a valid certificate of inspection.

§ 71.01–5 Posting.

(a) On vessels of over 25 gross tons, the original certificate of inspection shall, in general, be framed under glass and posted in a conspicuous place where it will be most likely to be observed by the passengers. On vessels not over 25 gross

tons, and on other vessels such as barges, where the framing of the certificate under glass would be impracticable, the original certificate of inspection shall be kept on board to be shown on demand.

§ 71.01–10 Period of validity.

(a) Certificates of inspection will be issued for a period of one year, except for those vessels subject only to the act of May 10, 1956 (46 U.S.C. 390–390g), when the certificates will be issued for a period of three years. Application may be made by the owner for inspection and issuance of a new certificate of inspection at any time within its period of validity.

(b) The certificate of inspection may be revoked or suspended at any time.

§ 71.01–15 Temporary certificate.

(a) If necessary to prevent delay of the vessel, a temporary certificate of inspection, Form CG–854, shall be issued pending the issuance and delivery of the regular certificate of inspection. Such temporary certificate shall be carried in the same manner as the regular certificate and shall in all ways be considered the same as the regular certificate of inspection which it represents.

§ 71.01–20 Expired certificate.

(a) Nothing in this subpart shall prevent a vessel upon a regularly established line from a port in the United States to a port of a foreign country not contiguous to the United States whose certificate of inspection expires at sea or while said vessel is in a foreign port or a port of Hawaii from lawfully completing her voyage without the valid certificate of inspection or temporary certificate required by this subpart: *Provided*, That the voyage shall be completed within 30 days after the expiration of the certificate of inspection. No such vessel shall depart if its certificate of inspection will expire within 15 days of the date of sailing.

Subpart 71.05—Permit To Proceed to Another Port for Repair

§ 71.05–1 When issued.

(a) The Officer in Charge, Marine Inspection, may issue a permit to proceed to another port for repair, Form CG–948, to a vessel, if in his judgment it can be done with safety, even if the certificate of inspection of the vessel has expired or is about to expire.

§ 71.05–5 To whom issued.

(a) Such permit will only be issued upon the written application of the master, owner, or agent of the vessel.

§ 71.05–10 Conditions of permit.

(a) The permit will state upon its face the conditions under which it is issued and whether or not the vessel is permitted to carry freight or passengers. Passengers may not be carried if the certificate of inspection has expired, except as provided under § 71.01–20.

§ 71.05–15 Posting.

(a) The permit shall be carried in a manner similar to that described in § 71.01–5 for a certificate of inspection.

Subpart 71.10—Permit To Engage in Excursions

AUTHORITY: The provisions of this Subpart 71.10 interpret or apply R.S. 4466, as amended; 46 U.S.C. 453.

§ 71.10–1 When issued.

(a) The Officer in Charge, Marine Inspection, may issue a permit to carry additional passengers on an excursion, Form CG–949, if after personally inspecting the vessel, it can, in his judgment, be done with safety.

§ 71.10–5 To whom issued.

(a) Such permit will only be issued upon the written application of the master, owner, or agent of the vessel.

§ 71.10–10 Conditions of permit.

(a) The permit will state upon its face the conditions under which it is issued, the number of extra passengers the vessel may carry, any additional lifesaving or safety equipment which will be required, the route for which the permit is granted, and the dates on which the permit will be valid.

§ 71.10–15 Posting.

(a) The permit when used, shall be carried in addition to the certificate of inspection and shall be carried in a manner similar to that described in § 71.01–5 for a certificate of inspection.

Subpart 71.15—Inspection of Vessels

§ 71.15–1 Standards in inspection of hulls, boilers, and machinery.

(a) In the inspection of hulls, boilers, and machinery of vessels, the standards established by the American Bureau of Shipping, see Subpart 70.35 of this subchapter respecting material and inspection of hulls, boilers, and machinery, and the certificate of classification referring thereto, except where otherwise provided for by the rules and regulations in this subchapter, Subchapter E (Load Lines), Subchapter F (Marine Engineering), or Subchapter J (Electrical Engineering) of this chapter, shall be accepted as standard by the inspectors.

Subpart 71.20—Initial Inspection

§ 71.20–1 Prerequisite of certificate of inspection.

(a) The initial inspection is a prerequisite of the issuance of the original certificate of inspection.

§ 71.20–5 When made.

(a) The original inspection will only be made upon the written application of the owner or builder of the vessel to the Officer in Charge, Marine Inspection, on Form CG–3752, application for inspection of U.S. vessel, at or nearest the port where the vessel is located.

§ 71.20–10 Plans.

(a) Before application for inspection is made and before construction is started, the owner or builder shall have plans indicating the proposed arrangement and construction of the vessel approved by the Commandant. The procedure for submitting plans and the list of plans to be supplied is set forth in Subpart 71.65.

§ 71.20–15 Scope of inspections.

(a) The initial inspection, which may consist of a series of inspections during the construction of a vessel, shall include a complete inspection of the structure, machinery, and equipment, including the outside of the vessel's bottom, and the inside and outside of the boilers. The inspection shall be such as to insure that the arrangements, materials, and scantlings of the structure, boilers and other pressure vessels and their appurtenances, piping, main and auxiliary machinery, electrical installations, lifesaving appliances, fire-detecting and extinguishing equipment, pilot ladders, and other equipment fully comply with the applicable regulations for such vessel and are in accordance with approved plans, and that the radio installations, including fixed and portable radios for lifeboats, are in accordance with the requirements of the Federal Communications Commission. The inspection shall also be such as to insure that the workmanship of all parts of the vessel and its equipment is in all respects satisfactory and that the vessel is provided with lights, means of making sound signals and distress signals as required by applicable regulations and the applicable "Rules of the Road."

(b) For nuclear vessels, the foregoing inspections shall be made except insofar as they may be limited by the presence of radiation. In addition, the inspection shall include any special requirements of the vessel's "Safety Assessment."

§ 71.20–20 Specific tests and inspections.

(a) The applicable tests and inspections relating to annual inspection as set forth in Subpart 71.25 shall be made at this time. In addition, the following specific tests and inspections shall be made by the inspector:

(1) Installation of lifeboats, davits, and winches, see Subpart 75.35 of this subchapter.

(2) Installation of carbon dioxide extinguishing piping, see § 76.15–15 of this subchapter.

(3) For inspection procedures of marine engineering equipment and systems, see Subchapter F (Marine Engineering) of this chapter.

(4) For inspection procedures of electrical engineering equipment and systems, see Subchapter J (Electrical Engineering) of this chapter.

(5) For inspection and testing standards of structural subdivision integrity, see § 72.01–25 of this subchapter.

(6) For inspection and testing of watertight doors, see § 73.35–30 of this subchapter.

Subpart 71.25—Annual Inspection

§ 71.25–1 Prerequisite of reissuance of certificate of inspection.

(a) The annual inspection is a prerequisite of the reissuance of a certificate of inspection.

§ 71.25–5 When made.

(a) The annual inspection will be made only upon the written application of the

master, owner, or agent of the vessel on Form CG–3752, Application for Inspection of U.S. Vessel, to the Officer in Charge, Marine Inspection, at or nearest the port where the vessel is to be inspected.

§ 71.25–10 Scope of inspections.

(a) The annual inspection shall include an inspection of the structure, boilers, and other pressure vessels, machinery and equipment. The inspection shall be such as to insure that the vessel, as regards the structure, boilers and other pressure vessels, and their appurtenances, piping, main and auxiliary machinery, electrical installations, lifesaving appliances, fire-detecting and extinguishing equipment, pilot ladders, and other equipment is in satisfactory condition and fit for the service for which it is intended, and that it complies with the applicable regulations for such vessels, and that the radio installations, including fixed and portable radios for lifeboats, are in compliance with the requirements of the Federal Communications Commission. The lights and means of making sound signals and the distress signals carried by the vessel shall also be subject to the above-mentioned annual inspection for the purpose of insuring that they comply with the requirements of the applicable regulations and the applicable "Rules of the Road."

(b) For nuclear vessels, the foregoing inspections shall be made except insofar as they may be limited by the presence of radiation. In addition, the inspection shall include any special requirements of the vessel's "Safety Assessment."

§ 71.25–15 Lifesaving equipment.

(a) At each annual inspection, the inspector shall conduct the following tests and inspections of lifesaving equipment:

(1) It shall be demonstrated that the air tanks of all lifesaving appliances are airtight.

(2) Each lifeboat shall be lowered to near the water and then be loaded with its allowed capacity, evenly distributed throughout the length and then be lowered into the water until it is afloat and be released from the falls: *Provided*, That lifeboats on river ferryboats and on river vessels shall be lowered to the water and afloat before loading. In making this test persons or deadweight may be used. The total weight used shall be at least equal to the allowed capacity of the lifeboat, considering persons to weigh 165 pounds each.

(3) Each life preserver or wood float shall be examined to determine its serviceability. If found to be satisfactory, it will be stamped "Passed," together with the date, the port, and the inspector's initials. If not in a serviceable condition, the life preserver or wood float shall be removed from the vessel. If the life preserver is beyond repair, it shall be destroyed in the presence of the inspector.

(4) All lifeboat winch electrical control apparatus shall be opened up and inspected.

(5) Where gravity davits are installed, it shall be demonstrated that each lifeboat can be swung out and lowered from any stopped position by merely releasing the brake on the lifeboat winch. The use of force to start the davits or the lifeboat winch will not be permitted.

(6) Inflatable liferafts shall be serviced at an approved servicing facility in accordance with Subpart 160.051 of Subchapter Q (Specifications) of this chapter. Inflatable liferafts shall be serviced at an approved servicing facility every 12 months or not later than the next vessel inspection for certification provided the total time since date of last servicing does not exceed 15 months. The period for servicing is computed from date of last servicing. Except in emergencies no servicing should be done aboard vessels. If at any time external damage is found to the container or straps or if the seal is broken, the Officer in Charge, Marine Inspection, shall be notified and the raft shall be serviced by an approved servicing facility.

NOTE: After the raft has been satisfactorily serviced in the presence of a marine inspector at an approved servicing facility, the raft is repacked and sealed and the carrying case stamped "PASSED" together with the date, port, and the inspector's initials.

(7) Where launching devices for inflatable liferafts are installed, the launching device shall be proof tested with a weight equal to the raft and its full complement of persons and equipment.

(8) All other items of lifesaving equipment shall be examined to determine that they are in suitable condition.

§ 71.25–20 Fire-detecting and extinguishing equipment.

(a) At each annual inspection, the inspector shall conduct the following tests and inspections of fire detecting and extinguishing equipment:

(1) All hand portable fire extinguishers and semiportable fire extinguishing systems shall be checked as noted in Table 71.25–20 (a) (1). In addition, the hand portable fire extinguishers and semiportable fire extinguishing systems shall be examined for excessive corrosion and general condition.

TABLE 71.25–20(a)(1)

Type unit	Test
Soda acid	Discharge. Clean hose and inside of extinguisher thoroughly. Recharge.
Foam	Discharge. Clean hose and inside of extinguisher thoroughly. Recharge.
Pump tank (water or antifreeze).	Discharge. Clean hose and inside of extinguisher thoroughly. Recharge with clean water or antifreeze.
Cartridge operated (water, antifreeze or loaded stream).	Examine pressure cartridge and replace if end is punctured or if cartridge is otherwise determined to have leaked or to be in unsuitable condition. Remove liquid. Clean hose and inside of extinguisher thoroughly. Recharge with clean water, solution or antifreeze. Insert charged cartridge.
Carbon dioxide	Weigh cylinders. Recharge if weight loss exceeds 10 percent of weight of charge. Inspect hose and nozzle to be sure they are clear.[1]
Dry chemical (cartridge-operated type).	Examine pressure cartridge and replace if end is punctured or if cartridge is otherwise determined to have leaked or to be in unsuitable condition. Inspect hose and nozzle to see they are clear. Insert charged cartridge. Be sure dry chemical is free-flowing (not caked) and chamber contains full charge.
Dry chemical (stored pressure type).	See that pressure gage is in operating range. If not, or if seal is broken, weigh or otherwise determine that full charge of dry chemical is in extinguisher. Recharge if pressure is low or if dry chemical is needed.
Vaporizing liquid[2] (pump type).	Pump a few strokes into clean pail and replace liquid. Keep water out of extinguisher or liquid. Keep extinguisher completely full of liquid.
Vaporizing liquid[2] (stored pressure type).	See that pressure gage is in operating range. Weigh or check liquid level to determine that full charge of liquid is in extinguisher. Recharge if pressure is low or if liquid is needed.

[1] Cylinders shall be tested and marked in accordance with the regulations of the Interstate Commerce Commission, as noted in § 147.04–1 of Subchapter N (Dangerous Cargoes) of this chapter.

[2] Vaporizing-liquid type fire extinguishers containing carbon tetrachloride or chlorobromomethane or other toxic vaporizing liquids shall be removed from all vessels. (See § 76.50–5(e) of this subchapter.)

(2) Fixed fire extinguishing systems shall be checked as noted in Table 71.25–20 (a) (2). In addition all parts of the fixed fire extinguishing systems shall be examined for excessive corrosion and general conditions.

TABLE 71.25–20 (a) (2)

Type system	Test
Foam	Systems utilizing a soda solution shall have such solution replaced. In all cases, ascertain that powder is not caked.
Carbon dioxide	Weigh cylinders. Recharge if weight loss exceeds 10 percent of weight of charge.[1]

[1] Cylinders shall be tested and marked in accordance with the regulations of the Interstate Commerce Commission, as noted in § 147.04–1 of Subchapter N (Dangerous Cargoes) of this chapter.

(3) All fire detecting and extinguishing systems, all piping controls, valves, and alarms shall be checked to ascertain that the system is in operating condition. In this respect, automatic sprinkling systems shall be checked by means of test stations or opening heads, smoke detecting systems shall be checked by introducing smoke into the accumulators, fire detecting and manual alarm systems shall be checked by test stations or actuating detectors or pull boxes, and steam smothering lines shall be checked with at least a 50 p. s. i. air pressure with the ends capped or by blowing steam through the lines at the designed pressure.

(4) The fire main system shall be operated and the pressure checked at the most remote and highest outlets. All fire hose shall be subjected to a test pressure equivalent to the maximum pressure to which they may be subjected in service, but not less than 100 p. s. i.

§ 71.25–25 Hull equipment.

(a) At each annual inspection, the inspector shall conduct the following tests and inspections of hull equipment:

(1) All subdivision bulkheads shall be examined to determine that their watertight integrity has not been impaired.

(2) All watertight doors shall be operated locally by manual power and also by hydraulic or electric power if so fitted. Where remote control is fitted, the doors shall also be operated by the remote control apparatus.

(3) All magnetically controlled fire doors shall be operated locally and by the remote control, and all automatic fire dampers shall be checked to determine that they are in an operable condition.

(4) The remote controls of all valves shall be operated.

(5) An inspection of the cargo gear shall be required. The inspection may consist of tests and examinations to determine the condition and suitability of the cargo gear. Current valid certificates and registers of cargo gear issued by nonprofit organizations or associations approved by the Commandant, may be accepted as prima facie evidence of the condition and suitability of the cargo gear. Cargo gear certificates and registers will not be issued by the Coast Guard.

(b) Every acceptable cargo gear certificate and/or register shall be properly executed by a person authorized to do so and shall:

(1) Certify as to the tests and examinations conducted;

(2) Show the dates on which the tests and examinations were conducted; and,

(3) Indicate that the cargo gear therein described complies with standards equal to or exceeding those set forth in Subpart 71.47.

(c) Competent persons for the purposes of this section and Subpart 71.47 are:

(1) Coast Guard marine inspectors;

(2) Surveyors of the organizations or associations approved by the Commandant;

(3) Such other persons as are authorized by the regulations in Subpart 71.47 as may be required; and,

(4) Responsible officials or employees of the testing laboratories, companies, or organizations who conduct tests of pieces of loose cargo gear, wire rope, or the annealing of gear as may be required.

(d) The registers issued in connection with cargo gear certification must have all required entries fully completed as of the dates indicated, shall be kept current, and shall include the following:

(1) A register of the cargo handling machinery and the gear accessory thereto carried on the vessel named therein;

(2) Certification of the testing and examination of winches, derricks, and their accessory gear;

(3) Certification of the testing and examination of cranes, hoists, and their accessory gear;

(4) Certification of the testing and examination of chains, rings, hooks, shackles, swivels, and blocks;

(5) Certification of the testing and examination of wire rope;

(6) Certification of the heat treatment of chains, rings, hooks, shackles, and swivels which require such treatment; and,

(7) Certification of the annual thorough examinations of gear not required to be periodically heat treated.

(e) It is the responsibility of the master to have a ship's officer inspect cargo gear when required by Subpart 71.47. For those inspected vessels which do not have valid cargo gear certificates and registers as provided by this section, such vessels will be required to have their shipboard cargo gear undergo tests and examinations in accordance with the provisions of Subpart 71.47.

§ 71.25–30 Electrical engineering equipment.

(a) For inspection procedures of electrical engineering equipment and systems, see subchapter J (Electrical Engineering) of this chapter.

§ 71.25–35 Marine engineering equipment.

(a) For inspection procedures of marine engineering equipment and systems, see Subchapter F. (Marine Engineering) of this chapter.

§ 71.25–40 Sanitary inspection.

(a) At each annual inspection the passenger and crew quarters, toilet and washing spaces, galleys, serving pantries, lockers, etc., shall be examined by the inspector to be assured that they are in a sanitary condition.

(Sec. 4, 49 Stat. 1935, as amended; 46 U.S.C. 660a)

§ 71.25–45 Fire hazards.

(a) At each annual inspection, the inspector shall examine the tank tops and bilges in the machinery spaces to see that there is no accumulation of oil which might create a fire hazard.

§ 71.25–50 Inspector not limited.

(a) Nothing in this subpart shall be construed as limiting the inspector from making such tests or inspections as he deems necessary to be assured of the safety and seaworthiness of the vessel.

Subpart 71.30—Reinspection

§ 71.30–1 When made.

(a) In general, at least three reinspections shall be made on each vessel within one year. These reinspections will be made at approximately equal intervals between annual inspections. In the case of vessels with a seasonal schedule, reinspections will be made during the operating season if practicable.

(b) For those vessels subject only to the act of May 10, 1956 (46 U.S.C. 390–390g), reinspections will be made annually between inspections for certification.

§ 71.30–5 Scope.

(a) The inspector shall examine all accessible parts of the vessel's hull, machinery, and equipment to be assured that it is in a satisfactory condition.

(b) In general, the scope of the reinspection shall be the same as for the annual inspection, but will be in less detail unless it is determined that major change has occurred since the last annual inspection.

§ 71.30–10 Inspector not limited.

(a) Nothing in this subpart shall be construed as limiting the inspector from making such tests or inspections as he deems necessary to be assured of the safety and seaworthiness of the vessel.

Subpart 71.40—Inspection After Accident

§ 71.40–1 General or partial survey.

(a) A survey, either general or partial, according to the circumstances, shall be made every time an accident occurs or a defect is discovered which affects the safety of the vessel or the efficacy or completeness of its lifesaving appliances, fire-fighting or other equipment, or whenever any important repairs or renewals are made. The survey shall be such as to insure that the necessary repairs or renewals have been effectively made, that the material and the workmanship of such repairs or renewals are in all respects satisfactory, and that the vessel complies in all respects with the regulations in this subchapter.

(R.S. 4450, as amended; 46 U.S.C. 239)

Subpart 71.45—Sanitary Inspections

§ 71.45–1 When made.

(a) An inspection of passenger and crew quarters, toilet and washing spaces, serving pantries, galleys, etc., shall be made, in general, at least once in every month. If the route of the vessel is such that it is away from a United States port for more than one month, an inspection shall be conducted at least once every trip.

(Sec. 4, 49 Stat. 1935, as amended; 46 U.S.C. 660a)

Subpart 71.47—Inspection of Cargo Gear

§ 71.47–1 When made.

(a) The specific tests and examinations shall be made at the intervals stated in the regulations in this subpart.

(b) A thorough examination of the assembled gear shall be made at least once in every year.

(c) An inspection to determine the condition and suitability of shipboard cargo gear will be made by a marine inspector at each inspection for certification. Inspections may be made at such other times as considered necessary by the Officer in Charge, Marine Inspection.

(d) For vessels fitted with cargo gear, an initial test of the assembled units under proof loads shall be conducted, followed by a complete dismantling or disassembling of such gear and a thorough examination of the parts to ascertain its condition. Subsequent tests of the assembled units under proof loads, followed by a dismantling or disassembling of such gear and a thorough examination shall be made once every 4 years, or oftener if necessary.

§ 71.47–3 Definitions of terms and words used in this subpart.

(a) *Cargo gear.* The term "cargo gear" includes masts, stays, booms, winches, cranes, elevators, conveyors, standing and running gear forming that part of the shipboard cargo gear used in connection with the loading or unloading of a vessel. This term does not include material handling gear and rigging of special design vessels used solely in dredging, pile driving, drilling for mineral deposits, and construction work.

(b) *Dismantling or disassembling of gear.* The "dismantling" or "disassembling" of gear contemplated is the taking apart of units of gear to the extent necessary to determine the suitability of such gear for continued service and as may be specifically required to carry out the intent of a particular regulation in this subpart. After proof load tests the disassembling need not include the sheaves and pins of the blocks included in the test unless there appears to be evidence of deformation or failure.

(c) *Thorough examination.* The "thorough examination" contemplated is a visual examination, supplemented if necessary by other means such as by a hammer test or by a test with electronic or ultrasonic devices.

(d) *Ton.* The word "ton" means a ton of 2,240 pounds.

(e) *Safe working load.* The "safe working load" (SWL) contemplated is the load the gear is approved to lift, excluding the weight of the gear itself.

§ 71.47–5 Tests and examinations of shipboard cargo gear.

(a) For vessels fitted with cargo gear and without valid cargo gear certificates and registers issued by organizations or associations, recognized by the Coast Guard, inspections shall be made by those competent persons described in § 71.25–25(c) (1) and (2), to determine the condition and suitability of the shipboard cargo gear. For the initial and subsequent quadrennial inspections, all the cranes, winches, hoists, derrick booms, derrick and mast bands, and all parts used in loading or unloading cargo shall be assembled in units and such assembled units shall then be tested under proof loads. The proof loads shall be handled for various types of units as required by specific regulations in this subpart. After the proof load tests of the assembled units of gear have been made, such gear shall be disassembled or dismantled so as to permit them to be thoroughly examined. The sheaves and pins of the blocks included in these proof load tests need not be removed unless there appears to be evidence of deformation or failure.

(b) For vessels fitted with cargo gear and holding valid cargo gear certificates and registers issued by organizations or associations recognized by the Coast Guard, the marine inspectors may accept such certificates as prima facie evidence of compliance with the requirements in this subpart. If an Officer in Charge, Marine Inspection, is in doubt as to the condition and suitability of shipboard cargo gear for such a vessel, the tests and examinations, or such portions thereof as deemed necessary, provided for in this subpart will be required.

(c) If any part or portion of the gear fails or becomes defective during such tests, such defective equipment shall be satisfactorily repaired or replaced.

§ 71.47–10 Cargo gear of special design and limited use.

(a) The regulations in this subpart shall apply to cargo gear of special design and limited use (derrick barges rigged for heavy lifts, cargo booms on self unloaders, etc.) only to the extent that it is practicable to do so. These requirements may be modified by the Officer in Charge, Marine Inspection, where the inspection is performed, according to the design characteristics of such cargo gear.

(b) Nondestructive tests, such as radiography, ultrasonic, electronic or other methods, may be utilized to determine the condition of heavy lift gear after it has been unit tested, provided such methods are acceptable to the Officer in Charge, Marine Inspection, having cognizance of the tests. However, no deviations or modifications shall be permitted to lessen the requirements for cargo gear inspection as set forth in § 71.47–70 and the maintenance of the applicable cargo gear records as set forth in § 71.47–75.

§ 71.47–15 Cargo gear plans required when plans are not approved by a classification society.

(a) For a new vessel or a vessel applying for initial inspection, the following plans of cargo gear shall be submitted in triplicate to the Officer in Charge, Marine Inspection, having jurisdiction for approval:

(1) Plans showing a stress diagram with the principal details of the gear.

(2) Plans containing a diagram showing the arrangement of the assembled gear and indicating the safe working load for each component part.

(b) The safe working load on which the design of any component part of the cargo gear is to be based, shall be taken as the maximum resultant load upon the component part in the design conditions assumed. The safe working load of the assembly is the load the gear is approved to lift, excluding the weight of the gear itself.

(c) One approved copy of each set of cargo gear plans shall be retained on the vessel.

§ 71.47–20 Cargo gear plans approved by a classification society.

(a) The plans required by § 71.47–15 (a) need not be submitted to the Officer in Charge, Marine Inspection, for approval if such plans are or have been approved by the American Bureau of Shipping or similar classification society recognized by the Commandant.

(b) One approved copy of each set of cargo gear plans shall be retained on the vessel.

§ 71.47–25 Factors of safety.

(a) In the design of the cargo gear, the safety factors in Table 71.47–25(a), taken in association with suitable design assumptions for actual loading conditions, shall be used and regarded as minima.

TABLE 71.47–25(a)

Safe working loads for component parts	Safety factors based on—		
	Ultimate strength	Yield point	Breaking test load
All metal structural parts, except steel booms:			
When the working load of the assembled gear is 10 tons or less	[1] 5	----	----
When the working load of the assembled gear is 13 tons or over	[1] 4	----	----
Steel booms:			
When the working load of the assembled gear is 10 tons or less	----	[1] 3	----
When the working load of the assembled gear is 13 tons or over	----	[1] 2½	----
Wooden structural parts	8	----	----
Chains	4½	----	----
Wire rope:			
For working loads 10 tons [1] or under	----	----	5
For working loads over 10 tons [1]	----	----	4
Fiber rope:			
When intended for running rigging	7	----	----
When intended for fixed gears and vangs	5	----	----

[1] For working loads between 10 and 13 tons, intermediate values of safety factors may be used.

(b) The Commandant will give consideration to the use of factors of safety differing from those given in Table 71.47–25(a) where special materials or cargo gear of special design are to be used.

§ 71.47–30 Loose gear certificates and tests.

(a) (1) Evidence of compliance with the proof load test requirements in this section for all chains, rings, hooks, links, shackles, swivels, blocks, and any other loose gear whether accessory to a machine or not, but which is used as ship's cargo gear, shall be listed on an appropriate certificate.

(2) This evidence of test and the recording thereof is required only once with respect to each article of gear so long as each article is identified and the certificates required are available on the vessel.

(3) Proof loads applied to the articles of loose gear shall be as shown in Table 71.47–30(a)(3).

(b) All chains, rings, hooks, links, shackles, swivels, blocks, and any other loose gear whether accessory to a machine or not, but which is used or intended for use as ship's cargo gear, shall bear a mark or number by which each piece can be identified and shall be listed on a loose gear certificate. The safe working load "SWL" shall be marked on all blocks.

(c) The loose gear certificate shall show the distinguishing number or mark applied to the article of gear; a description of the article of gear; the date when the test proof load was applied; and the safe working load. The forms for loose gear certificates shall be as prescribed by and acceptable to associations or organizations approved by the Comman-

TABLE 71.47-30(a)(3)

Article of gear	*Proof load*
Chains, rings, hooks, links, shackles, swivels	Twice the safe working load.
Single sheave block	Four times the safe working load.[1]
Multiple sheave block with safe working load up to and including 20 tons.[1]	Twice the safe working load.
Multiple sheave block with safe working load over 20 tons up to and including 40 tons.	20 tons in excess of the safe working load.
Multiple sheave block over 40 tons	One and a half times the safe working load.
Roller chains (pitched chains) used with hand operated chain falls, and rings, hooks, shackles, or swivels permanently attached thereto.	Do.
Chain fall blocks used with roller chains (pitched chains), and rings, hooks, shackles, or swivels permanently attached thereto.	Do.

[1] The proof load applied to the block is equivalent to twice the maximum resultant load on the eye or pin when lifting the safe working load attached to a rope which passes around the sheave of the block. The proof load is, therefore, equal to four times the safe working load or twice the safe working load when the load is attached directly to the block instead of a rope passing around the sheave.

dant and shall be suitable for the purposes of this section.

(d) After being tested all of the gear shall be examined to ascertain whether any part has been damaged, permanently deformed by the test or has other visible defects. The pins and sheaves of all tested blocks shall be removed for this purpose. If damaged during these tests, such gear shall be satisfactorily repaired or replaced.

(e) The required examinations as set forth in paragraph (d) of this section may be accomplished by mechanical, electrical, or other means provided the method employed is equal in efficiency to the visual examination of disassembled gear.

§ 71.47-35 Test and certification of wire rope.

(a) All wire rope used as shipboard cargo gear shall be able to withstand a breaking test load of at least five times the safe working load. In the case of gear with a lifting capacity of over 10 tons, the breaking test load of wire rope shall be at least four times the safe working load. All wire rope shall be identified and described in a wire rope certificate. Such certificate shall be furnished and attested to by the manufacturer or a testing agency and shall certify:

(1) The breaking test load of a sample of the wire rope, which should be at least five times the safe working load or at least four times the safe working load if part of gear with a lifting capacity of over 10 tons;

(2) The name and address of the manufacturer;

(3) The diameter of the rope in inches and/or fractions thereof;

(4) The number of strands and the number of wires in each strand;

(5) The quality of the wire (e.g. improved plow steel);

(6) The date of the test; and,

(7) The load at which the sample broke.

(b) The forms for the wire rope certificates shall be as prescribed by and acceptable to associations or organizations approved by the Commandant and shall be suitable for the purposes described in this section.

(c) In addition to the manufacturers' or testing agencies' attestations, a sample of the wire rope may be tested to destruction if required by the marine inspector when a visual inspection indicates an apparent defective condition.

§ 71.47-40 Proof test of cargo gear as a unit.

(a) Winches with their accessory gear, including the derricks and attachments, at least once in each four years, shall be tested as a unit with proof loads exceeding the safe working load as set forth in Table 71.47-40(a).

TABLE 71.47-40(a)

Safe working load of assembled gear	*Proof load*
Not exceeding 20 tons	25 percent in excess.
Over 20 tons but not exceeding 50 tons.	5 tons in excess.
Over 50 tons	10 percent in excess.

(b) The proof load applied to winches and their gear shall be lifted with the ship's normal tackle, including the winches, and with the boom at an angle which should not be greater than 15 degrees to the horizontal or to the lowest angle approved in association with the design, or when these angles are impracticable to the lowest practicable angle. When the load has been lifted, it shall be swung as far as possible in both directions.

(1) Where electrical winches are fitted with electromagnetic brakes, or where electrohydraulic winches are fitted with electromagnetic or hydraulic brakes at the winch, mechanical brakes for manual operations will not be required, but if so fitted shall be in satisfactory operating condition.

(2) Current for electric winch operation during the test shall be taken from the ship's circuits. Shore current may be used if it passes through the ship's switchboard.

(c) Cranes and other hoisting machines with their accessory gear, at least once in each four years, shall be tested with a proof load which shall exceed the safe working load as set forth in Table 71.47-40(a).

(d) The proof load applied to cranes and hoists shall be lifted, topped and swung (slewed) as far as possible in each direction. If the boom of the crane has a movable radius, it shall be tested with a proof load as set forth in this section at the maximum and minimum radii of the boom. In the case of hydraulic cranes whose capacity is limited by pressure, and with which it is not possible to lift a load 25 percent in excess of the safe working load, the greatest possible load in excess of the safe working load, shall be used. These tests and the amounts of the loads shall be recorded.

(e) After satisfactory completion of the proof load testing of the cargo gear in accordance with paragraphs (a), (b), (c), and (d) of this section, the cargo gear and all component parts shall be given a thorough visual examination, supplemented as necessary by other means such as a hammer test or with electronic or ultrasonic devices, to determine if any of the parts were damaged, deformed, or otherwise rendered unsafe for further use. If found defective, such gear shall be replaced.

(1) When the test is being conducted for the first time on a vessel, accessory gear shall be dismantled or disassembled for examination after the test. The sheaves and pins of the blocks included in this test need not be removed unless there appears to be evidence of deformation or failure.

(2) For subsequent tests such parts of the machinery and gear shall be dismantled and/or disassembled after the test as necessary to determine its suitability for continued service.

(f) Appropriate means shall be provided to prevent the foot of the boom from being accidentally lifted from the socket during the test.

(g) Vessels whose cargo gear has been in use but are without the valid registers and certificates described in § 71.25-25 will be inspected for defective cargo gear. The gear shall then be tested and examined as prescribed in this section. If the movable weights for proof testing are not reasonably available, a spring or hydraulic scale certified for accuracy may be used. Whenever such scales are used, the proof load shall be applied with the boom swung out as far as possible in one direction and then in the other direction, and at such intermediate positions as may be indicated. At any position, the indicator of the scale must maintain a constant reading under the proof load for a period of five minutes.

(h) On all types of winches and cranes efficient means shall be provided to stop and hold the proof load in any position, and the efficiency of such means shall be demonstrated.

(i) Electric winches, electrohydraulic winches fitted with electromagnetic or hydraulic brakes at the winch, or cranes shall be equipped so that a failure of the electric power shall stop the motion and set the brakes without any action on the part of the operator.

(2) Current for electric winch and crane operations during the tests shall be taken from the ship's circuits. Shore current may be used if it passes through the ship's switchboard.

§ 71.47–45 Marking of booms and cranes.

(a) The safe working load (abbreviated "SWL") for the assembled gear shall be marked on the heel of each boom with the minimum angle to the horizontal for which the gear is designed. These letters and figures shall be in contrasting colors to the background and at least one inch in height.

(b) Where booms are rated at varying capacities depending on the radii, tables indicating the maximum safe working loads for the various working angles of the boom and the maximum and minimum radii at which the boom may be safely used shall be conspicuously posted near the controls and visible to the operator when working the gear.

§ 71.47–50 Use of wire rope and chains.

(a) An eye splice made in any wire rope used as cargo gear, with or without a thimble, shall have at least three tucks with whole strands and two tucks with one half of the wire cut from the tucking strand: *Provided*, That this requirement shall not preclude the use of any other form of splice or connection if it is as efficient as the splice specified.

(b) Single wire rope cargo falls, wire rope pendants, topping lifts and preventers shall consist of clear lengths without splices except at the working ends. Wire rope clips shall not be used to form eyes in the working ends of single wire rope cargo falls.

(c) Wire rope shall not be used for shipboard cargo gear if in any length of 8 diameters, the number of broken wires exceeds ten percent of the total number of wires in the rope, or if the rope shows other signs of excessive wear, corrosion, kinking or defect.

(d) Hoisting or sling chains used for shipboard cargo gear shall not be used if a length of chain has been stretched more than five percent of the original length, or the chain has become unsafe through overloading or faulty heat treatment, or whenever other external defects are evident.

(e) Chains used for shipboard cargo gear shall not be shortened by knotting, bolting, or wiring the links. The use of chains having a knot or kink as shipboard cargo gear is prohibited.

§ 71.47–55 Annealing.

(a) Chains, hooks, rings, links, shackles, and swivels of wrought iron used as cargo gear shall be annealed at the following intervals:

(1) Wrought iron chains and gear in general use and of one half inch or less, once at least in every six months.

(2) All other wrought iron chains and gear, including topping lift chains, in general use, at least once in every twelve months.

(b) The annealing shall be done in a suitable closed oven and not over an open fire. Wrought iron shall be annealed at a temperature of between 1100° and 1200° Fahrenheit for a period of between 30 and 60 minutes. After being annealed, the article shall be allowed to cool slowly and shall be then tested completely for defects.

(c) Heat treatment of the cargo gear shall be done only by reputable firms having suitable equipment and personnel trained for this purpose. A certificate attesting to the annealing of all gear heat treated shall be furnished to the vessel.

(d) The heat treatment of chains, hooks, rings, links, shackles, and swivels of materials other than wrought iron used as cargo gear, if required, shall be effected in accordance with the manufacturer's instructions.

§ 71.47–60 Additions to gear.

(a) When articles of loose gear and/or wire rope conforming with the requirements in this subpart are added to installed gear, or used as replacements in such gear from time to time, a record shall be maintained on the vessel which shall identify each article and the certificate accompanying it.

§ 71.47–65 Alterations, renewals, or repairs of cargo gear.

(a) Whenever important repairs, renewals, or alterations are indicated or intended for the masts, booms, and permanent fittings of the cargo gear, such repairs, renewals, or alterations shall be undertaken only after compliance with the applicable provisions of § 71.55–1.

(b) Tests and examinations of the repairs, renewals, or alterations will be in accordance with the provisions of § 71.47–40.

(c) When welding is used to lengthen, alter, or repair chains, rings, hooks, links, shackles, or swivels, they shall be properly heat treated and shall before being again put into use, be tested and examined in accordance with the provisions of § 71.47–30.

§ 71.47–70 Responsibility of ship's officer for inspection of cargo gear.

(a) All wire rope, chains other than bridle chains attached to booms or masts, and all rings, hooks, links, shackles, swivels and blocks used in loading or unloading shall be visually inspected by a ship's officer designated for that purpose by the master.

(b) These inspections by a ship's officer shall be made at frequent intervals, and in any event not less than once in each month.

(c) Immediately after such an inspection by a ship's officer notations of such an inspection shall be made in record form which shall be in or kept with the cargo gear register if carried. In addition, the same notations of inspections together with the dates shall be entered in the Official Logbook for those vessels required to carry this record, or such information shall be kept with the log records maintained on vessels not required to carry the Official Logbook. (See § 71.47–75 for entries required to be kept.)

§ 71.47–75 Records regarding cargo gear.

(a) The cargo gear records described in this subpart shall be maintained on the vessel and shall be made available to Coast Guard officials upon request. These records shall be kept for the periods of time they are valid and, in addition, until the next Coast Guard inspection for certification of the vessel. The certificates of manufacturers and/or testing laboratories, companies, or organizations shall be maintained on the vessel so long as the gear described in such certificates is on board the vessel.

(b) The records of all the inspections of cargo gear made by the ship's officers in accordance with § 71.47–70 shall be maintained on the vessel for periods of time which agree with those periods as covered by the current Coast Guard certificate of inspection issued to the vessel. These records shall show the dates of inspections, identify articles inspected, the conditions observed, and the name of the officer performing the inspection.

(c) The records of all tests and examinations conducted by or under the supervision of surveyors of the organizations or associations approved by the Commandant shall be maintained on the vessel.

(d) The Coast Guard will not issue cargo gear certificates and/or registers. The Coast Guard's records of inspections, tests, and examinations of a particular vessel's cargo gear made by a marine inspector or conducted under the supervision of the Coast Guard will be maintained in the office of the Officer in Charge, Marine Inspection, having jurisdiction over the vessel at the time such work was performed. The original certificates or certified copies of certificates of manufacturers and/or testing laboratories, companies, or organizations for loose cargo gear, wire rope, or the annealing of gear shall be maintained on the vessel.

§ 71.47–80 Advance notice that cargo gear testing is desired.

(a) The owner, agent, or master of a vessel shall give an advance notice when it is desired that the tests and examinations of cargo gear be made by or under the supervision of the marine inspector. This advance notice shall be given to the Officer in Charge, Marine Inspection, in whose marine inspection zone the vessel is available for such inspection and examination.

(b) For the initial inspection and examination of cargo gear by the Coast Guard, the advance notice shall be to the cognizant Officer in Charge, Marine Inspection, as early as possible and shall include sketches and/or drawings showing each unit of cargo gear, the identification of component parts and the safe working loads. Copies of original certificates of manufacturers and/or testing laboratories, companies, or organizations maintained on the vessel may be accepted by the cognizant Officer in Charge, Marine Inspection, when satisfied such certificates properly describe the qualities of the component parts of the gear in question.

§ 71.47–85 Responsibility for conducting required tests and examinations.

(a) The vessel's owners and/or operators shall furnish and pay the expenses required in conducting the tests and examinations prescribed by the regula-

tions in this subpart, including the supplying of all instruments, other equipment, and personnel including personnel supervision for performance of all work required.

(b) The Coast Guard's participation in these required tests and examinations shall be confined to witnessing required tests and examinations with the view to determining whether or not the gear is satisfactory for the purpose intended. In the event it is determined that the gear is defective or unable to meet the standards set forth in this subpart, such gear, or portions thereof, shall be replaced to the satisfaction of the Officer in Charge, Marine Inspection, having jurisdiction over the vessel.

Subpart 71.50—Drydocking

§ 71.50–1 When required.

(a) Except for extensions as authorized by the Commandant, all vessels making international voyages shall be placed in drydock or hauled out for examination at least once every 12 months.

(b) Except for extensions as authorized by the Commandant, all vessels not making international voyages shall be placed in drydock or hauled out for examination within the periods set forth in this paragraph, depending upon the service.

(1) Each vessel shall be drydocked or hauled out at intervals not to exceed 18 months if it operates in salt water an aggregate of more than 9 months in the 18-month period since it was last drydocked or hauled out.

(2) Each vessel shall be drydocked or hauled out at intervals not to exceed 36 months if it operates in salt water an aggregate of 6 months or less in each 12-month period since it was last drydocked or hauled out. When a vessel exceeds this aggregate amount of service in salt water in any 12-month period since it was last drydocked or hauled out, it shall be drydocked or hauled out within 6 months after the end of that period or within the 36-month interval, whichever is earlier.

(3) Each vessel shall be drydocked or hauled out at intervals not to exceed 60 months if it operates exclusively in fresh water.

§ 71.50–5 Notice by owner.

(a) The master, owner, or agent shall notify the Officer in Charge, Marine Inspection, when any vessel is to be placed on a drydock in order that an examination of the underwater portion of the vessel may be made if deemed necessary.

Subpart 71.55—Repairs and Alterations

§ 71.55–1 Permission required.

(a) No repairs or alterations affecting the safety of the vessel with regard to the hull, machinery, or equipment, shall be made without the knowledge of the Officer in Charge, Marine Inspection.

(b) Drawings of alterations shall be approved before work is started, unless deemed unnecessary by the Officer in Charge, Marine Inspection.

(c) Drawings will not be required for repairs in kind.

§ 71.55–5 Inspection required.

(a) An inspection, either general or partial depending upon the circumstances, shall be made whenever any important repairs or alterations are undertaken.

Subpart 71.60—Special Operating Requirements

§ 71.60–1 Inspection and testing required when making alterations, repairs, or other such operations involving riveting, welding, burning or like fire-producing actions.

(a) The provisions of "Standard for the Control of Gas Hazards on Vessels to be Repaired," NFPA No. 306, published by National Fire Protection Association, 60 Batterymarch Street, Boston, Mass., 02110, shall be used as a guide in conducting the inspections and issuance of certificates required by this section.

(b) Until an inspection has been made to determine that such operation can be undertaken with safety, no alterations, repairs, or other such operations involving riveting, welding, burning, or like fire-producing actions shall be made:

(1) Within or on the boundaries of cargo tanks which have been used to carry combustible liquid or chemicals in bulk; or,

(2) Within or on the boundaries of fuel tanks; or,

(3) To pipe lines, heating coils, pumps, fittings, or other appurtenances connected to such cargo or fuel tanks.

(c) Such inspections shall be made and evidenced as follows:

(1) In ports or places in the United States or its territories and possessions the inspection shall be made by a marine chemist certificated by the National Fire Protection Association; however, if the services of such certified marine chemist are not reasonably available, the Officer in Charge, Marine Inspection, upon the recommendation of the vessel owner and his contractor or their representative, shall select a person who, in the case of an individual vessel, shall be authorized to make such inspection. If the inspection indicated that such operations can be undertaken with safety, a certificate setting forth the fact in writing and qualified as may be required, shall be issued by the certified marine chemist or the authorized person before the work is started. Such qualifications shall include any requirements as may be deemed necessary to maintain, insofar as can reasonably be done, the safe conditions in the spaces certified throughout the operation and shall include such additional tests and certifications as considered required. Such qualifications and requirements shall include precautions necessary to eliminate or minimize hazards that may be present from protective coatings or residues from cargoes.

(2) When not in such a port or place, and a marine chemist or such person authorized by the Officer in Charge, Marine Inspection, is not reasonably available, the inspection shall be made by the senior officer present and a proper entry shall be made in the vessel's logbook.

(d) It shall be the responsibility of the senior officer present to secure copies of certificates issued by the certified marine chemist or such person authorized by the Officer in Charge, Marine Inspection. It shall be the responsibility of the senior officer present, insofar as the persons under his control are concerned, to maintain a safe condition on the vessel by full observance of all qualifications and requirements listed by the marine chemist in the certificate.

Subpart 71.65—Plan Approval

§ 71.65–1 General.

(a) The list of required plans is general in character, but includes all plans in § 71.65–5 which normally show construction and safety features coming under the cognizance of the Coast Guard. In the case of a particular vessel, all of the plans enumerated may not be applicable, and it is intended that only those plans and specifications be submitted as will clearly show the vessel's arrangement, construction and required equipment.

(b) In the list of required plans in § 71.65–5 the items which must be approved by the American Bureau of Shipping for vessels classed by that organization are indicated by an asterisk. When prints bearing record of such approval by the American Bureau of Shipping are forwarded to the Coast Guard they will in general be accepted as satisfactory except insofar as the law or the Coast Guard regulations contain requirements which are not covered by the American Bureau of Shipping.

§ 71.65–5 Plans and specifications required for new construction.

(a) *General.* (1) Specifications.

(2) General Arrangement Plan of decks, holds, inner bottoms, etc., and including inboard and outboard profile.

(b) *Hull structure.*[1] (1) *Inner Bottom Plating and Framing.

(2) *Midship Section.

(3) *Shell Plating and Framing.

(4) *Stem, Stern Frame, and Rudder.

(5) *Structural Deck Plans for Strength Decks.

(6) *Pillars and Girders.

(7) *Watertight and Oiltight Bulkheads.

(8) *Foundations for Main Machinery and Boilers.

(9) *Arrangement of Ports, Doors, and Airports in Shell Plating.

(10) *Hatch Coamings and Covers in Weather and Watertight Decks.

(11) *Details of Subdivision Watertight Doors and Operating Gear.

(12) *Scuppers and Drains Penetrating Shell Plating.

(13) *Arrangement of the cargo gear including a stress diagram. The principal details of the gear and the safe working load for each component part shall be shown.

[1] The asterisk (*) indicates items which may require approval by the American Bureau of Shipping for vessels classed by that society.

(c) *Hull calculations, etc.* (1) Lines (for information).
(2) Curves of Form.
(3) Floodable length Curves. Including calculations and construction drawings. (These drawings shall show all watertight subdivision, including inner bottom, bulkheads, flats, shaft tunnels, pipe tunnels, escape tunnels, etc., and the location and type of all subdivision watertight doors.)
(4) Calculations of Stability in Intact and Final Flooding Conditions.
(5) Capacity Plan showing capacities and vertical and longitudinal centers of gravity of cargo spaces, tanks, etc. (for information).
(6) Tank Sounding Tables (for information).
(7) Draft Mark Locations (for information).
(d) *Fire control.* (1) Fire control diagram showing location and type of all required fire-screen insulation, including main fire zone and subdivisions, stairway and elevator enclosures, control space enclosures, etc., and type of all doors in such subdivisions and enclosures.
(2) Comprehensive typical details of fire-screen insulation of both vertical and horizontal surfaces, including deck coverings where used, keyed by reference numbers to the "fire control diagram".
(3) Ventilation diagram including dampers and other fire control features.
(4) Alarm systems.
(5) Detecting systems.
(6) Extinguishing systems, including fire mains, carbon dioxide, foam, and sprinkling systems.
(7) Supervised Patrol Route.
(e) *Marine engineering.* (1) For plans required for marine engineering equipment and systems, see Subchapter F (Marine Engineering) of this chapter.
(f) *Electrical engineering.* (1) For plans required for electrical engineering equipment and systems, see Subchapter J (Electrical Engineering) of this chapter.
(g) *Lifesaving equipment.* (1) These plans are to show the location and arrangement of embarkation decks, all overboard discharges and projections in way of launching lifeboats, weights of lifeboats fully equipped and loaded, working loads of davits and winches, types and sizes of falls, the manufacturer's name and identification for all equipment, and all other relevant and necessary information.
(i) Arrangement of lifeboats.
(ii) Arrangement of davits.
(iii) Location and stowage of liferafts and buoyant apparatus.
(h) *Crew's accommodations.* (1) Arrangement plans showing accommodations, ventilation, escapes, hospital, and sanitary facilities for all crewmembers.

§ 71.65–10 Plans required for alterations of existing vessels.

(a) In the event of alterations involving the safety of the vessel, the applicable plans shall be submitted for approval covering the proposed work, except as modified by § 71.55–1(b). The general scope of the plans shall be as noted in § 71.65–5.

§ 71.65–15 Procedure for submittal of plans.

(a) As the relative location of shipyards, design offices, and Coast Guard offices vary throughout the country, no specific routing will be required in the submittal of plans. In general, one of the following procedures would apply, but in a particular case, if a more expeditious procedure can be used, there will be no objection to its adoption:
(1) The plans may be submitted to the Officer in Charge, Marine Inspection, in the district in which the vessel is to be built. This procedure will be most expeditious in the case of those offices where personnel and facilities are available for examination and approval of the plans locally.
(2) The plans may be submitted directly to the Commandant (MMT), U. S. Coast Guard, 1300 "E" Street, NW., Washington, D.C., 20226. In this case, the plans will be returned directly to the submitter, with a copy of the action being forwarded to the interested Officer in Charge, Marine Inspection.
(3) The plans may be submitted directly to field technical offices:
(i) Commander, 3d Coast Guard District (mmt), 45 Broadway, New York, N.Y., 10006, for geographical area covered by 1st, 3d, and 5th Coast Guard Districts.
(ii) Commander, 8th Coast Guard District (mmt), Room 308, Custom House, New Orleans, La., 70130, for geographical area covered by 2d, 7th, and 8th Coast Guard Districts.
(iii) Commander, 12th Coast Guard District (mmt), 630 Sansome St., San Francisco, Calif., 94501, for geographical area covered by 11th, 12th, 13th, 14th, and 17th Coast Guard Districts.
(4) In the case of classed vessels, upon specific request by the submitter, the American Bureau of Shipping will arrange to forward the necessary plans to the Coast Guard indicating its action thereon. In this case, the plans will be returned as noted in subparagraph (2) of this paragraph.

§ 71.65–20 Number of plans required.

(a) Four copies of each plan are normally required so that one can be returned to the submitter. If the submitter desires additional approved plans, a suitable number should be submitted to permit the desired distribution.

Subpart 71.75—Certificates Under the International Convention for Safety of Life at Sea, 1960

§ 71.75–1 Application.

(a) The provisions of this subpart shall apply to all vessels on an international voyage.

§ 71.75–5 Passenger Ship Safety Certificate or Nuclear Passenger Ship Safety Certificate.

(a) All vessels on an international voyage are required to have a "Passenger Ship Safety Certificate" or a "Nuclear Passenger Ship Safety Certificate," as appropriate.
(b) All such vessels shall meet the requirements of this chapter for vessels on an international voyage.

§ 71.75–10 Exemption Certificate.

(a) A vessel may be exempted by the Commandant from complying with certain requirements of the Convention under his administration upon request made in writing to him and transmitted via the Officer in Charge, Marine Inspection.
(b) When an exemption is granted to a vessel by the Commandant under and in accordance with the Convention, an Exemption Certificate describing such exemption shall be issued through the appropriate Officer in Charge, Marine Inspection, in addition to the Passenger Ship Safety Certificate.
(c) Nuclear vessels cannot be exempted from any requirements of the International Convention for Safety of Life at Sea, 1960.

§ 71.75–15 Posting of Convention certificates.

(a) The certificates described in this subpart, or certified copies thereof, when issued to a vessel shall be posted in a prominent and accessible place on the vessel.
(b) The certificate shall be carried in a manner similar to that described in § 71.01–5 for a certificate of inspection.

§ 71.75–20 Duration of certificates.

(a) The certificates shall be issued for a period of not more than 12 months.
(b) An Exemption Certificate shall not be valid for longer than the period of the Passenger Ship Safety Certificate to which it refers.
(c) The Passenger Ship Safety Certificate or the Nuclear Passenger Ship Safety Certificate may be withdrawn, revoked, or suspended at any time when it is determined the vessel is no longer in compliance with applicable requirements. (See § 2.01–70 of this chapter for procedures governing appeals.)

PART 72—CONSTRUCTION AND ARRANGEMENT

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AUTHORITY: The provisions of this Part 72 issued under R.S. 4405, as amended, 4462, as amended; 46 U.S.C. 375, 416. Interpret or apply R.S. 4399, as amended, 4400, as amended, 4417, as amended, 4418, as amended, 4421, as amended, 4426, as amended, 4433, as amended, 4453, as amended, 4488, as amended, 4490, as amended, 4491, as amended, sec. 14, 29 Stat. 690, as amended, sec. 10, 35 Stat. 428, as amended, 41 Stat. 305, as amended, sec. 5, 49 Stat. 1384, as amended, secs. 1, 2, 49 Stat. 1544, 1545, as amended, sec. 17, 54 Stat. 166, as amended, sec. 3, 54 Stat. 347, as amended, sec. 3, 70 Stat. 152, sec. 3, 68 Stat. 675; 46 U.S.C. 361, 362, 391, 392, 399, 404, 411, 435, 481, 482, 489, 366, 395, 363, 369, 367, 526p, 1333, 390b, 50 U.S.C. 198; E.O. 11239, July 31, 1965, 30 F.R. 9671, 3 CFR, 1965 Supp. Treasury Department Orders 120, July 31, 1950, 15 F.R. 6521; 167-14, Nov. 26, 1954, 19 F.R. 8026; 167-20, June 18, 1956, 21 F.R. 4894; CGFR 56-28, July 24, 1956, 21 F.R. 5659; 167-38, Oct. 26, 1959, 24 F.R. 8857, unless otherwise noted.

Subpart 72.01—Hull Structure

§ 72.01-1 Application.

(a) The provisions of this subpart, with the exception of § 72.01-90, shall apply to all vessels contracted for on or after November 19, 1952, which are not subject to the act of May 10, 1956 (46 U.S.C. 390-390g). Vessels contracted for prior to November 19, 1952, which are not subject to the act of May 10, 1956, shall meet the requirements of § 72.01-90. The application of this subpart to vessels subject to the act of May 10, 1956, shall be in accordance with the policy expressed in § 70.05-15 of this subchapter.

§ 72.01-5 Vessels subject to load line.

(a) For vessels assigned a load line, see Subchapter E (Load Lines) of this chapter, for special requirements as to strength, closure of openings, etc.

(Sec. 2, 45 Stat. 1493, as amended, sec. 2, 49 Stat. 888, as amended; 46 U.S.C. 85a, 88a. Treasury Department Order 167-48, Oct. 19, 1962, 27 F.R. 10504)

§ 72.01-10 Vessels using fuel having a flashpoint of 110 degrees F. or lower.

(a) Where liquid fuel having a flashpoint of 110 degrees F. or lower is carried for main or auxiliary machinery or for starting purposes, such machinery and fuel tanks shall be in separate vapor tight compartments separating each from the other and from the remainder of the vessel.

§ 72.01-15 Structural standards.

(a) In general, compliance with the standards established by the American Bureau of Shipping, see Subpart 70.35 of this subchapter, will be considered satisfactory evidence of the structural efficiency of the vessel. However, in special cases, a detailed analysis of the entire structure or some integral part may be made by the Coast Guard to determine the structural requirements.

§ 72.01-20 Special consideration.

(a) Special consideration will be given to the structural requirements for vessels, such as small vessels or vessels of unusual design not contemplated by the standards established by the American Bureau of Shipping, see Subpart 70.35 of this subchapter.

§ 72.01-25 Structural subdivision requirements.

(a) Vessels required by Part 73 of this subchapter to have subdivision bulkheads, double bottoms, etc., shall comply with the following structural subdivision requirements:

(1) Each watertight subdivision bulkhead, whether transverse or longitudinal, shall be constructed in such a manner that it shall be capable of supporting, with a proper margin of resistance, the pressure due to the maximum head of water which it might have to sustain in the event of damage to the vessel, but at least the pressure due to a head of water up to the margin line. The construction of the bulkheads shall be to the satisfaction of the Commandant.

(2) Steps and recesses in subdivision bulkheads shall be watertight and as strong as the bulkhead at the place where each occurs. Decks, trunks, tunnels, duct keels, ventilators, etc., that are made watertight to maintain the subdivision requirements for a vessel shall be of the same strength as the bulkhead at the corresponding levels. The means used for making them watertight and the arrangements adopted for closing openings in them shall be to the satisfaction of the Commandant. Watertight ventilators and trunks shall be carried at least up to the bulkhead deck.

(3) Where frames or beams pass through a watertight bulkhead or deck, such bulkhead or deck shall be made structurally watertight without the use of wood, cement, or similar materials.

(4) Subdivision bulkheads, including steps, recesses, trunks, tunnels, ventilators, etc., which might form part of such bulkheads, shall be thoroughly examined and hose tested upon completion of construction. The water pressure for such tests shall be at least 30 p. s. i. Testing of main compartments by filling them with water is not compulsory.

(5) The forepeak, double bottoms (including duct keels), and inner skins shall be tested with water to-a-head corresponding to the requirements of subparagraph (1) of this paragraph upon completion of construction.

(6) The watertight space enclosing the stern tube shall be tested by filling with water to-a-head up to the deepest subdivision load line.

(7) Tanks which are intended to hold liquids, and which form part of the subdivision of the vessel, shall be tested for tightness upon completion of construction with water to-a-head up to the deepest subdivision load line or to-a-head corresponding to ⅔ of the depth from the top of the keel to the margin line in way of the tanks, whichever is greater; but in no case shall the test-head be less than 3 feet above the top of the tank.

(8) The tests referred to in the preceding subparagraphs (5), (6), and (7) of this paragraph, are for the purpose of insuring that the subdivision structural arrangements are watertight and are not regarded as a test of the fitness of any compartment for the storage of oil, fuel or for other specific purposes for which a test of a superior character may be required depending upon the height to which the liquid has access in the tank or its connections.

§ 72.01-90 Vessels contracted for prior for November 19, 1952.

(a) Existing structure previously approved will be considered satisfactory so long as it is maintained in good condition to the satisfaction of the Officer in

Charge, Marine Inspection. Minor repairs and alterations may be made to the same standard as the original construction.

Subpart 72.03—General Fire Protection

§ 72.03–1 Application.

(a) The provisions of this subpart shall apply to all vessels.

§ 72.03–5 Fire hazards to be minimized.

(a) The general construction of the vessel shall be such as to minimize fire hazards insofar as is reasonable and practicable.

§ 72.03–10 Woodwork insulated from heated surfaces.

(a) Internal combustion engine exhausts, boiler and galley uptakes and similar sources of ignition shall be kept clear of and suitably insulated from any woodwork or other combustible matter.

§ 72.03–15 Lamp room construction.

(a) Lamp, paint, and oil lockers and similar compartments shall be constructed of steel or shall be wholly lined with metal.

Subpart 72.05—Structural Fire Protection

§ 72.05–1 Application.

(a) The provisions of this subpart shall apply to the following vessels:

(1) All vessels of 100 gross tons and over.

(2) All vessels which carry more than 150 passengers.

(3) All vessels on an international voyage.

(b) The provisions of this subpart, with the exception of § 72.05–90, shall apply to all vessels noted in paragraph (a) of this section contracted for on or after May 26, 1965. Such vessels contracted for prior to May 26, 1965, shall meet the requirements of § 72.05–90.

§ 72.05–5 Definitions.

NOTE: The parenthetical number after each space refers to the applicable column and row number in Tables 72.05–10 (d) through (g).

(a) "Safety areas" will be considered as including the following spaces:

(1) Control stations, i.e., spaces containing the emergency source of power, and those spaces in which a continuous watch is maintained and in which navigating, radio, or fire-control equipment is located. (1)

(2) Passenger and crew stairway and elevator enclosures. (2)

(3) Passenger and crew communicating corridors. (3)

(4) Open decks and enclosed promenades in way of lifeboat embarkation or lowering positions. (4) (See also paragraph (l) of this section.)

(b) "Accommodation spaces" will be considered as including the following spaces:

(1) Public spaces, such as halls, dining rooms, messrooms, lounges, cafes, and other similar spaces normally accessible during the voyage. (5) through (7) (Depending upon size and furnishings.)

(2) Public sales rooms and similar spaces. (6) or (7) (Depending on size.)

(3) Staterooms, including passenger and crew rooms, barber shops, beauty parlors, offices, dispensaries, etc. (5) or (6) (Depending on furnishings.)

(4) Washrooms and toilet spaces, both public and private. (8)

(5) Isolated lockers and small storerooms in accommodation areas. (6)

(6) Isolated serving pantries, etc., in accommodation areas, with incombustible furnishings. (8)

(7) Operating rooms. (8)

(8) Small laundries containing only tubs and washing machines, with no facilities for drying other than small electric driers. (8)

(9) Small cleaning gear lockers containing only slop sinks, and having no room for stowing materials other than a broom, mop, cleaning powder, soap, etc. (8)

(10) Large cleaning gear lockers having considerable stowage space. (6) or (9)

(c) "Service spaces" will be considered as including the following spaces:

(1) Motion picture projection rooms and film stowage rooms. (6) or (9)

(2) Galleys, main pantries, and storerooms, including alleyways and stairs, part of and for the exclusive use of such spaces. (9)

(3) Diet kitchens. (6) or (9) (Depending on furnishing.)

(4) Work shops (not part of machinery spaces, galleys, etc.), large laundries, drying rooms, mail and baggage rooms, etc. (9)

(5) Garbage disposal and stowage rooms, and trash stowage rooms. (9)

(6) Paint and lamp rooms, and similar spaces containing highly combustible materials. (9)

(d) "Machinery spaces" will be considered as including the following spaces:

(1) Main machinery spaces, including trunks and casings, alleyways, gratings, and stairways, part of and for the exclusive use of these spaces, auxiliary machinery spaces containing internal combustion machinery or other oil burning, heating, or pumping units, and fuel oil filling stations. (10)

(2) Auxiliary machinery spaces containing only pumps, tanks, electrical machinery, ventilation or air conditioning equipment, resistors, steering machinery, stabilizer machinery, etc. (12) (Where such spaces contain considerable stowage space for combustibles.) (10)

(e) "Cargo spaces" will be considered as including the following spaces:

(1) Cargo holds, lockers, and trunks, both accessible and inaccessible and including refrigerated cargo spaces and cargo oil tanks intended for the alternate carriage of dry cargo. (11)

(2) Cargo oil tanks if not intended for the alternate carriage of dry cargo. (12)

(f) "Miscellaneous spaces" will be considered as including the following spaces:

(1) Fuel and water tanks and voids. (12)

(2) Open decks and enclosed promenades except in way of lifeboat embarkation and lowering positions. (13) (See also paragraph (l) of this section.)

(3) Shaft alleys when separated from machinery spaces, and containing no space assigned for the stowage of combustibles. (12)

(g) A "standard fire test" is one which develops in the test furnace a series of time-temperature relationships as follows:

5 minutes	1,000° F.
10 minutes	1,300° F.
30 minutes	1,550° F.
60 minutes	1,700° F.

(h) "Main vertical zones" are those sections, the mean length of which does not, in general, exceed 131 feet on any one deck, into which the hull, superstructure, and deckhouses are required to be divided by fire-resisting bulkheads.

(i) Where the term "steel or other equivalent metal" is used in this part, it is intended to require a material which, by itself or due to insulation provided, has structural and integrity qualities equivalent to steel at the end of the applicable fire exposure.

(j) Working spaces will be considered as only those service and machinery spaces where personnel are normally employed as contrasted to those where personnel may occasionally visit or be employed for short periods of time.

(k) Passenger or crew corridors over 8 feet in width will be considered as public spaces for the purpose of this subpart.

(l) Spaces which might be considered as open decks due to the presence of permanent openings to the weather in one or more sides, or where any or all sides may be completely open to the weather, will be considered as interior or enclosed spaces for the purpose of this subpart if any spot on the overhead is more than 15 feet from the nearest opening to the weather. This requirement shall only apply to those portions of the space as are under a deck or canopy, but it shall not be considered as a restriction against permanent opening or a restriction against the materials used for a canopy. This paragraph shall not apply to open or enclosed promenades having a nominal width of 15 feet or less.

(m) Where balconies are installed opening into a space, the following general requirements shall be met:

(1) For the purpose of meeting main vertical zone bulkhead spacing, the length of the space to which the balcony is open will be considered as being increased by an amount equal to the gross area of the balcony divided by the average width of the space.

(2) Where balconies are formed by penetrating one or more decks, the bulkheads in the upper portion of the space are, in effect, part of a stepped or recessed deck and should be treated as such for fire control purposes. In this regard, particular attention should be given to the protection of openings with proper doors of the type indicated in § 72.05–25(b) (9).

(3) Two means of escape shall be provided for each balcony, at least one of which shall be independent of the space to which the balcony is open.

§ 72.05–10 Type, location, and construction of fire control bulkheads and decks.

(a) The hull, structural bulkheads, decks, and deckhouses shall be constructed of steel or other equivalent metal construction of appropriate scantlings.

(b) The hull, superstructure, and deck houses shall be subdivided by suitable structural steel or other equivalent metal bulkheads into main vertical zones, the mean length of which shall not, in general, exceed 131 feet on any one deck. Where practicable, the main vertical zone bulkheads shall be kept in a single vertical plane. However, on vessels designed for special purposes, such as automobile or railroad car ferries, where the installation of such bulkheads would defeat the purpose for which the vessel is intended, equivalent means for controlling and limiting a fire may be substituted if specifically approved by the Commandant.

(c) All bulkheads and decks shall be classed as A–60, A–30, A–15, A–0, B–15, B–0, or C, depending upon the type of space on each side of the bulkhead or above and below the deck.

(1) Bulkheads or decks of the "A" Class shall be composed of steel or equivalent metal construction, suitably stiffened and made intact with the main structure of the vessel, such as shell, structural bulkheads, and decks. They shall be so constructed that, if subjected to the standard fire test, they would be capable of preventing the passage of smoke and flame for 1 hour. In addition, they shall be so insulated with approved structural insulation, bulkhead panels, or deck covering that the average temperatures on the unexposed side would not rise more than 250° F. above the original temperature, nor would the temperature at any one point, including any joint, rise more than 325° F. above the original temperature, within the time listed below:

Class A–60..... 60 minutes.
Class A–30..... 30 minutes.
Class A–15..... 15 minutes.
Class A–0..... 0 minutes (i.e., no insulation requirements).

(2) Bulkheads of the "B" Class shall be constructed with approved incombustible materials and made intact from deck to deck (or to ceiling as provided in paragraph (h) of this section) and to shell or other boundaries. They shall be so constructed that, if subjected to the standard fire test, they would be capable of preventing the passage of flame for ½ hour. In addition, their insulation value shall be such that the average temperature of the unexposed side would not rise more than 250° F. above the original temperature, nor would the temperature at any one point, including any joint, rise more than 405° F. above the original temperature within the time listed below:

Class B–15..... 15 minutes.
Class B–0..... 0 minutes (i.e., no insulation requirements).

(3) Class C bulkheads or decks shall be constructed of approved incombustible materials, but need meet no requirements relative to the passage of flame nor the limiting of temperature rise.

(d) The minimum requirements for the bulkheads between the various spaces, where such bulkheads form the boundaries of main vertical zones, shall be as noted in Table 72.05–10(d).

(e) The minimum requirements for the bulkheads between the various spaces, where such bulkheads do not form the boundaries of main vertical zones, shall be as noted in Table 72.05–10 (e).

(f) The minimum requirements for the decks between the various spaces, where such decks form the boundaries of stepped main vertical zones, shall be as noted in Table 72.05–10(f).

(g) The minimum requirements for the decks between the various spaces, where such decks do not form the boundaries of stepped main vertical zones, shall be as noted in Table 72.05–10(g).

(h) Where ceilings or linings are fitted, "B" Class bulkheads, with the exception of those forming passageways, may stop at the ceiling or lining and need not continue to the deck or shell, provided the ceiling and/or lining is erected as indicated in paragraph (j) of this section. However, draft stops meeting at least Class B–O requirements shall be fitted not more than 45 feet apart between the ceiling or lining and the deck or shell. The space behind the linings of stairways and similar trunks shall have similar draft stops at each deck.

(i) Where Class B–15 bulkhead panels are required to go beyond the ceiling to the deck above, or beyond the lining to the shell, the portion of the bulkhead panel within the void space need only meet B–O requirements.

(j) Where "B" Class panels are used, all four edges of the panel shall be retained by continuous steel or equivalent metal flanges on both sides of the panel offering at least ¾ inch coverage. The top and bottom flanges shall be so attached to the structural decks above and below so as to support and restrain the panels in the event of fire. Other methods of construction may be specifically approved by the Commandant if determined to be equivalent.

(k) Any sheathing, furring, or holding pieces incidental to the securing of structural insulation shall be of approved incombustible materials.

TABLE 72.05–10(d)—BULKHEADS—MAIN VERTICAL ZONE

This space → / Adjacent to this space ↓		Control stations	Stairway and elevator enclosures	Corridors	Lifeboat embarkation or lowering stations	Staterooms and all public spaces with incombustible veneers and trim and fire resistant furnishings	Staterooms and public spaces of 500 square feet or less with combustible furnishings and isolated storerooms	Public spaces over 500 square feet with combustible furnishings	Washrooms, toilet spaces, and isolated pantries with incombustible fittings	Galleys, main pantries, storerooms, and workshops	Machinery spaces	Dry cargo spaces	Fuel and water tanks and voids	Open decks and enclosed promenades (not safety areas)
		1	2	3	4	5	6	7	8	9	10	11	12	13
Control stations	1	A–60	A–15	A–15	A–0	A–30	A–60	A–60	A–0	A–60	A–60	A–60	A–0	A–0
Stairway and elevator enclosures	2		A–0	A–0	A–0	A–0	A–60	A–60	A–0	A–60	A–60	A–60	A–0	A–0
Corridors	3			A–0	A–0	A–0	A–0	A–0	A–0	A–0	A–0	A–0	A–0	A–0
Lifeboat embarkation or lowering stations	4				C	A–0	A–0	A–0	A–0	A–0	A–0	A–0	A–0	C
Staterooms and all public spaces with incombustible veneers and trim and fire resistant furnishings	5					A–15	A–15	A–15	A–0	A–30	A–30	A–30	A–0	A–0
Staterooms and public spaces of 500 square feet or less with combustible furnishings, and isolated storerooms	6						A–60	A–60	A–0	A–60	A–60	A–60	A–0	A–0
Public spaces over 500 square feet with combustible furnishings	7							A–60	A–0	A–60	A–60	A–60	A–0	A–0
Washrooms, toilet spaces, and isolated pantries with incombustible fittings	8								A–0	A–0	A–0	A–0	A–0	A–0
Galleys, main pantries, storerooms, and workshops	9									A–0	A–0	A–0	A–0	A–0
Machinery spaces	10										A–0	A–0	A–0	A–0
Dry cargo spaces	11											A–0	A–0	A–0
Fuel and water tanks and voids	12												A–0	A–0
Open decks and enclosed promenades (not safety areas)	13													C

TABLE 72.05-10(e)—BULKHEADS—NOT MAIN VERTICAL ZONES

This space → / Adjacent to this space ↓		Control stations	Stairway and elevator enclosures	Corridors	Lifeboat embarkation or lowering stations	Staterooms and all public spaces with incombustible veneers and trim and fire-resistant furnishings	Staterooms and public spaces of 500 square feet or less with combustible furnishings and isolated storerooms	Public spaces over 500 square feet with combustible furnishings	Washrooms, toilet spaces, and isolated pantries with incombustible fittings	Galleys, main pantries, storerooms, and workshops	Machinery spaces	Dry cargo spaces	Fuel and water tanks and voids	Open decks and enclosed promenades (not safety areas)
		1	2	3	4	5	6	7	8	9	10	11	12	13
Control stations	1	B-0	A-0	A-0	A-0	A-15	A-60	A-60	A-0	A-60	A-60	A-60	A-0	A-0
Stairway and elevator enclosures	2		C	A-0	A-0	A-0	A-60	A-60	A-0	A-60	A-60	A-60	A-0	A-0
Corridors	3			C	A-0	B-0	B-0	A-0	B-0	A-0	A-0	A-0	A-0	A-0
Lifeboat embarkation or lowering stations	4				C	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	C
Staterooms and all public spaces with incombustible veneers and trim and fire-resistant furnishings	5					B-0	B-15	A-15	B-0	A-15	A-15	A-15	A-0	A-0
Staterooms and public spaces of 500 square feet or less with combustible furnishings, and isolated storerooms	6						B-15	A-30	B-0	A-60	A-60	A-60	A-0	A-0
Public spaces over 500 square feet with combustible furnishings	7							A-60	B-0	A-60	A-60	A-60	A-0	A-0
Washrooms, toilet spaces and isolated pantries with incombustible fittings	8								C	A-0	A-0	A-0	A-0	A-0
Galleys, main pantries, storerooms, and workshops	9									C[1]	A-0	A-0	A-0	A-0
Machinery spaces	10										C	A-0	A-0	A-0
Dry cargo spaces	11											A-0	A-0	A-0
Fuel and water tanks and voids	12												A-0	A-0
Open decks and enclosed promenades (not safety areas)	13													C

[1] Class C bulkheads may be used between two similar spaces, such as between two similar storerooms. However, a Class A-0 bulkhead shall be used between dissimilar spaces, such as a storeroom and a dissimilar workshop.

TABLE 72.05-10(f)—DECKS—MAIN VERTICAL ZONES

This space above → / This space below ↓		Control stations	Stairway and elevator enclosures	Corridors	Lifeboat embarkation or lowering stations	Staterooms and all public spaces with incombustible veneers and trim and fire resistant furnishings	Staterooms and public spaces of 500 square feet or less with combustible furnishings and isolated storerooms	Public spaces over 500 square feet with combustible furnishings	Washrooms, toilet spaces, and isolated pantries with incombustible fittings	Galleys, main pantries, storerooms, and workshops	Machinery spaces	Dry cargo spaces	Fuel and water tanks and voids	Open decks and enclosed promenades (not safety areas)
		1	2	3	4	5	6	7	8	9	10	11	12	13
Control stations	1	A-60	A-60	A-30	A-0	A-15	A-60	A-60	A-0	A-0	A-0	A-0	A-0	A-0
Stairway and elevator enclosures	2	A-15	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0
Corridors	3	A-30	A-0	A-0	A-0	A-0	A-0	A-15	A-0	A-0	A-0	A-0	A-0	A-0
Lifeboat embarkation or lowering stations	4	A-0	A-0	A-0	C	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	C
Staterooms and all public spaces with incombustible veneers and trim and fire resistant furnishings	5	A-30	A-30	A-15	A-0	A-15	A-15	A-30	A-0	A-0	A-0	A-0	A-0	A-0
Staterooms and public spaces of 500 square feet or less with combustible furnishings, and isolated storerooms	6	A-60	A-60	A-30	A-15	A-15	A-60	A-60	A-0	A-0	A-0	A-0	A-0	A-0
Public spaces over 500 square feet with combustible furnishings	7	A-60	A-60	A-60	A-30	A-30	A-60	A-60	A-0	A-0	A-0	A-0	A-0	A-0
Washrooms, toilet spaces, and isolated pantries with incombustible fittings	8	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0
Galleys, main pantries, storerooms, and workshops	9	A-60	A-60	A-60	A-30	A-30	A-60	A-60	A-0	A-0	A-0	A-0	A-0	A-0
Machinery spaces	10	A-60	A-60	A-60	A-30	A-30	A-60	A-60	A-0	A-0	A-0	A-0	A-0	A-0
Dry cargo spaces	11	A-60	A-60	A-60	A-30	A-30	A-60	A-60	A-0	A-0	A-0	A-0	A-0	A-0
Fuel and water tanks and voids	12	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0
Open decks and enclosed promenades (not safety areas)	13	A-0	A-0	A-0	C	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	C

TABLE 72.05-10(g)—DECKS—NOT MAIN VERTICAL ZONES

This space above → / This space below ↓		Control stations	Stairway and elevator enclosures	Corridors	Lifeboat embarkation or lowering stations	Staterooms and all public spaces with incombustible veneers and trim and fire resistant furnishings	Staterooms and public spaces of 500 square feet or less with combustible furnishings and isolated storerooms	Public spaces over 500 square feet with combustible furnishings	Washrooms, toilet spaces, and isolated pantries with incombustible fittings	Galleys, main pantries, storerooms, and workshops	Machinery spaces	Dry cargo spaces	Fuel and water tanks and voids	Open decks and enclosed promenades (not safety areas)
		1	2	3	4	5	6	7	8	9	10	11	12	13
Control stations	1	A-30	A-30	A-15	A-0	A-0	A-15	A-30	A-0	A-0	A-0	A-0	A-0	A-0
Stairway and elevator enclosures	2	A-0	C	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0
Corridors	3	A-15	A-0	A-0	A-0	A-0	A-0	A-15	A-0	A-0	A-0	A-0	A-0	A-0
Lifeboat embarkation or lowering stations	4	A-0	A-0	A-0	C	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	C
Staterooms and all public spaces with incombustible veneers and trim and fire resistant furnishings	5	A-15	A-15	A-0	A-0	A-0	A-0	A-15	A-0	A-0	A-0	A-0	A-0	A-0
Staterooms and public spaces of 500 square feet or less with combustible furnishings and isolated storerooms	6	A-60	A-60	A-30	A-15	A-0	A-30	A-60	A-0	A-0	A-0	A-0	A-0	A-0
Public spaces over 500 square feet with combustible furnishings	7	A-60	A-60	A-60	A-30	A-15	A-60	A-60	A-0	A-0	A-0	A-0	A-0	A-0
Washrooms, toilet spaces, and isolated pantries with incombustible fittings	8	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0
Galleys, main pantries, storerooms, and workshops	9	A-60	A-60	A-60	A-30	A-15	A-60	A-60	A-0	A-0	A-0	A-0	A-0	A-0
Machinery spaces	10	A-60	A-60	A-60	A-30	A-15	A-60	A-60	A-0	A-0	C	A-0	A-0	A-0
Dry cargo spaces	11	A-60	A-60	A-60	A-30	A-15	A-60	A-60	A-0	A-0	A-0	A-0	A-0	A-0
Fuel and water tanks and voids	12	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0
Open decks and enclosed promenades (not safety areas)	13	A-0	A-0	A-0	C	A-0	A-0	A-0	A-0	A-0	A-0	A-0	A-0	C

(l) Where linings or bulkhead panels are framed away from the shell or structural bulkheads, the deck within the void space so formed need only meet Class A-O requirements.

(m) Accommodation spaces, other than washrooms and toilet spaces, separated from corridors or other spaces covered by the supervised patrol by bulkheads of the "B" Class shall have a louver in the door. In lieu of the louver in the door, a screened opening approximately one inch in diameter will be accepted. Such opening to permit smoke to be detected by the patrol, shall be located as high as practicable in the bulkhead. In the event of a double bulkhead or similar construction, a suitable hollow sleeve or tube shall connect the inner and outer surfaces of the bulkhead.

(n) Decks within accommodation spaces and inside safety areas may have an overlay for leveling or finishing purposes which need not meet the requirements for an approved deck covering. Such an overlay will not be considered as giving any insulating value and may not in general exceed 3/8 of an inch in thickness. Greater thicknesses may be specifically approved by the Commandant for specific locations.

(o) Rugs and carpets may be used in addition to any deck covering or overlay installed. Rugs and carpets used in stairways or corridors shall be of wool, or other materials having equivalent fire-resistive qualities.

(p) Decking within surgical operating rooms shall be of a type which is acceptably conductive to prevent accumulation of dangerous electrostatic charges, and shall be in general agreement with "Code for Flammable Anesthetics," of issue in effect at the time the construction or alteration of the vessel is contracted for, published by the National Fire Protection Association, 60 Batterymarch Street, Boston, Mass., 02110.

(q) Decks in washrooms and toilet spaces, service, cargo, and machinery spaces, open decks, exterior safety areas, and enclosed promenades may have an overlay in any thickness. This overlay need not meet the requirements for an approved deck covering.

§ 72.05-15 Ceilings, linings, trim, and decorations in accommodation spaces and safety areas.

(a) Ceilings and linings and any furring incidental to their erection shall be of approved incombustible materials. Where such ceilings or linings are given credit for their insulating value in obtaining a bulkhead or deck classification they shall be of Class B-15 bulkhead panel material, and the construction shall be as required by § 72.05-10(j).

(b) Bulkheads, linings, and ceilings may have a combustible veneer within a room not to exceed 2/28 of an inch in thickness. However, combustible veneers shall not be used in passageways or stairway enclosures, or in spaces specifically restricted by Tables 72.05-10 (d) through (g).

(c) The total volume of combustible face trim, moldings, and decorations, including veneers, in any compartment shall not exceed a volume equivalent to 1/10 inch veneer on the combined area of the walls of the compartment. Such trim, molding, or decorations shall not perform any structural function, and shall not be used in corridors or stairway enclosures.

(d) Combustible veneers, trim, decorations, etc., shall not be used in or extend into hidden spaces such as behind linings or ceilings or in the interior of double bulkheads.

(e) Nothing in this subpart shall be construed as prohibiting the covering of any surface with a reasonable number of coats of paint or with a Marine Finish meeting the requirements of Subpart 164.012 of Subchapter Q (Specifications) of this chapter. This includes corridors, stairway enclosures, and hidden spaces.

(f) Partial bulkheads or decks used to subdivide a space for artistic treatment, privacy, etc., shall meet the requirements of Class C bulkheads.

§ 72.05-20 Stairways, ladders, and elevators.

(a)(1) Except as further noted, the provisions of this section apply to all vessels.

(2) For small vessels, special consideration for relief may be given where it is shown to be unreasonable or impracticable to meet the detailed requirements for stairway size, slope, dimensioning, and landing area.

(3) Stairways, ladders, and elevators within main machinery spaces or cargo holds are not covered by the general provisions of this section, but shall meet the requirements of paragraph (b) of this section.

(b) Stairways, ladders, and elevators within main machinery spaces and cargo holds shall meet the following requirements:

(1) All stairways, ladders, and elevators shall be of steel.

(c) Deck penetrations shall meet the following requirements:

(1) Where a continuous vertical deck penetration for a stairway or elevator exceeds one deck, the integrity of all decks involved shall be assured by enclosure bulkheads and decks meeting the applicable requirements of § 72.05-10 (d) through (g), and by doors at all levels meeting the requirements of § 72.05-25 (b)(9).

(2) Where only two decks are served by a stairway or elevator, the integrity of the deck involved may be assured as noted in the preceding paragraph. Alternately, the integrity may be maintained at one level only by means of bulkheads and by doors meeting the requirements of § 72.05-25(b)(9). If the latter method is used, it should be noted

that the integrity of a deck is involved, and accordingly, the bulkhead classifications should be selected from Tables 72.05–10(f) or 72.05–10(g), the spaces above or below being assumed to extend to the bulkheads and doors.

(3) Stairways or elevators to a balcony within a space need not be enclosed, provided the stairway or elevator serves only the space and the balcony within the space.

(d) For the purpose of this section, stairways are identified as follows:

Type 1—Main Vertical Zone enclosed stair towers.
Type 2—Enclosed stairways other than Type 1.
Type 3—Interior stairway not enclosed.
Type 4—Exterior stairways or exterior inclined ladders.

(e) Each Main Vertical Zone shall be served by at least one Type 1 stairway, so that independent of adjoining Main Vertical Zones, escape may be effected from any accommodation space or any other space where persons may be normally quartered or employed, to ALL other decks having any such spaces within the same Main Vertical Zone without coming out of the stair tower enclosure. Each Type 1 stairway shall give access to the Embarkation Deck or, if the Embarkation Deck does not extend to the portion of the vessel in question, to at least one weather deck from which convenient communication to the Embarkation Deck is provided by means of Type 4 stairways. In cases where a Type 1 stairway is accessible from two Main Vertical Zones, it may be considered as the required Type 1 stairway for both zones provided all boundaries of the stairway meet Main Vertical Zone requirements.

(f) Insofar as is reasonable and practicable, Types 1 and 2 stairways, and all elevator enclosures, should not give direct access to accommodations or other enclosed spaces in which a fire may originate.

(g) The furnishings for Types 1 and 2 stairways, and all elevator enclosures, shall be as set forth in § 72.05–55(c).

(h) In general, curved, spiral, or winding stairways will not be permitted. Relaxation from this requirement may be permitted, provided, in the opinion of the Commandant, the proposed stairway is equivalent with respect to safety and dimensions to the stairways covered by this section.

(i) For all types of stairways, the stairs, platforms, and landings shall be of sufficient strength to sustain a load of 100 pounds per square foot with a factor of safety of 4 based on the ultimate strength.

(j) The stringers, treads, and all platforms and landings of all Types 1, 2, and 3 stairways shall be of solid steel construction. Risers shall be of approved incombustible material.

(k) For all types of stairways, handrails shall be fitted on both sides of the stairs. For stairways in excess of 66 inches in width, additional center handrails shall be provided. All handrails shall be fitted at a vertical height above the tread at its nosing of between 33 and 36 inches.

(l) For all types of stairways, the stair width shall be clear of all obstructions other than the handrails.

(m) Handrails and trim for all Types 1, 2, and 3 stairways shall be of approved "incombustible materials."

(n) For all types of stairways, there shall be no variation in the width of the stairs, the depth of the tread, or the height of the risers in any flight. Where variation in height of riser or depth of tread in different flights is necessary, such variations shall be minimized.

(o) For all types of stairways, the sum of the riser height and tread depth shall be at least 17 inches and not more than 18 inches. Types 1, 2, and 3 stairways having treads less than 10 inches in depth shall have a nosing of one inch or other means to provide additional room on the tread.

(p) All stairways shall be dimensioned in accordance with Table 72.05–20(p), depending upon the type of stairway and the number of persons served.

TABLE 72.05–20(p)

Type of stairway	Primary use	Maximum angle of inclination (degrees)	Minimum stair tread width, in inches, based upon number of persons served by the stairway						
			Number of persons						
			1–10	11–20	21–30	31–40	41–50	51–60	Over 60
1	Passenger or crew	40	28	30	32	34	36	40	44
2 or 3	Passenger	40	28	30	32	34	36	36	36
2 or 3	Crew	50	28	30	30	30	30	30	30
4	Passenger or embarkation route.	45	28	30	30	30	30	30	30
4	Crew	55	24	24	24	24	24	24	24

(1) The maximum angle of inclination from the horizontal for any stairway shall be as given in Table 72.05–20(p).

(2) For all types of stairways, the minimum width shall be determined on a deck-by-deck basis. Except as further noted, on any particular deck, only those persons on that deck using the stairway are involved in the width determination. However, once a minimum required width has been established at any one level, that width may not be reduced at any subsequent deck level in the direction of normal escape. This does not prohibit the use of stair widths exceeding the required minimum for any particular flight or flights.

(3) The various spaces shall be considered to have the number of persons in them as follows:

(i) Passenger staterooms—designed capacity.

(ii) Crew staterooms—two-thirds designed capacity.

(iii) Theaters, dining halls, and similar spaces having fixed seating—maximum seating capacity.

(iv) Lounges, club rooms, etc.—1 person for every 20 square feet of deck area.

(v) Working spaces—normal operating capacity.

(4) Type 1 stairways shall be dimensioned on a deck-by-deck basis as described in the previous subparagraphs. In determining the number of persons using a Type 1 stairway, all persons within the Main Vertical Zone or Zones in question are assumed to be using Type 1 stairways. No consideration is given to any Type 2 or 3 stairways that may be available. If more than one Type 1 stairway serves a particular Main Vertical Zone, the persons shall be distributed between the stairways dependent upon the arrangements, and the stairways shall be dimensioned accordingly. If in the normal operation of the vessel, a Type 1 stairway is intended for a greater number of persons than given by the foregoing, the larger number shall be used.

(5) Types 2, 3, and 4 stairways shall be dimensioned on a deck-by-deck basis as described in this paragraph. In determining the number of persons using the stairways, the normal operation of the vessel shall be the determining factor. In this respect, if any particular stairway forms part of a normal debarkation route, the number of persons using the stairway for that purpose shall be considered.

(q) All types of stairways designed with a broken flight between any two decks shall conform to the additional requirements of this paragraph.

(1) Any interruption of the slope or change of direction of the stairway shall be accomplished by means of an intermediate landing of rectangular or nearly rectangular shape based on the actual dimensions of the stairs landing thereon.

(2) Each set of stairs of a broken flight shall be dimensioned independently, and shall conform to the minimum stair widths given in Table 72.05–20(p).

(r) Landings for stairways shall be provided in accordance with the applicable requirements of this paragraph.

(1) For all types of stairways, at the top and bottom of each flight of stairs, there shall be a clear landing having an area at least equal to the square of the actual stair tread width.

(2) For Type 1 stairways, there shall be provided within the enclosure at each deck level a landing having a minimum clear area in square feet, exclusive of the stairs, equal to 1.2 times the number of persons from that deck using the stairway.

(3) Where an aisle around a stairway is required due to the relationship of the flights, such aisle shall have a clear width at all points at least equal to the actual stair tread width.

(s) The total clear width of doors to stairways shall be as set forth in Table 72.05–20(s), and shall meet all of the other applicable requirements of this paragraph.

TABLE 72.05-20(s)

Type of stairway	Primary use	Minimum clear opening, in inches, of doors to stairways based on number of persons served by doors					
		Number of persons (*N*)					
		1-10	11-20	21-30	31-40	41-50	Over 50
1	Passenger or crew	28	30	32	34	36	[1] 0.75*N*
2 or 3	Passenger	28	30	32	34	36	36
2 or 3	Crew	28	30	30	30	30	30

[1] Obtain clear opening in inches by multiplying the number of persons served (*N*) by 0.75.

(1) The dimensioning of doors shall be based on the same fundamentals as described in subparagraphs (p) (2) through (5) of this section for stairways. However, the number of people involved for a particular door shall be determined from the arrangements, each door being calculated independent of any other doors to the stairway at the same level.

(2) In no case shall a clear door width be less than 28 inches.

(3) On the Embarkation Deck, each Type 1 stairway shall provide at least 44 inches of exit door width to each side of the vessel. Exit may be provided directly to the weather or indirectly by passageways and/or corridors which lead to the weather.

§ 72.05-25 Doors, other than watertight.

(a) The general requirement for doors, other than watertight doors, are as follows:

(1) All doors shall be capable of operation from either side by 1 person.

(2) In public spaces, stairway enclosures, corridors, etc., all doors shall open in the direction of escape where practicable.

(3) If it is desired to use decorative doors in addition to those required, they shall be constructed of approved incombustible materials and shall not interfere with the normal operation of the required doors, and shall open in the same direction if the required doors are in a main avenue of escape.

(4) For the purpose of this subpart, all glass permitted in doors shall be at least ¼-inch thick. However, greater thickness may be required for strength purposes in certain locations. Except for hardwood doors permitted by subparagraph (b) (8) of this section, all glass shall be fitted in steel or equivalent metal frames and shall be retained by steel or equivalent metal glazing beads or angles.

(5) Where wire-inserted glass is required, and the single wire type is employed, the strands shall run horizontally and shall be not more than 2 inches apart.

(6) Where hose ports are fitted, they shall be cut in the lower corner of the door on the side opposite the hinge so that if the hose is passed through the doorway when the door is open, it may be closed over the hose. The cut for the hose port should be approximately 6 inches square. A hinged or pivoted steel or equivalent metal cover shall be fitted in the cut, equipped with a bullet catch or similar method of fastening which will permit easy and automatic operation of the hinged cover.

(7) Combustible veneers may be used in doors where permitted for, and subject to the same conditions as, the bulkheads in which the doors are hung.

(8) The locking of doors may be permitted, except as noted in § 72.10-20.

(b) Doors in "A" Class bulkheads shall meet the following requirements:

(1) Doors in bulkheads required to be Class A-60, A-30, or A-15 shall be of hollow steel or equivalent metal construction solidly filled with approved structural insulation capable of meeting the requirements for a Class A-15 bulkhead.

(2) Doors in bulkheads required to be Class A-0 shall be of solid or hollow steel or equivalent metal construction capable of meeting the requirements of a Class A-0 bulkhead.

(3) Doors shall have a latch with a minimum throw of ¾ inch which can be operated from either side of the door. Double swing doors, where permitted for the proper utility of the space, may have the latch normally inoperative.

(4) Except as noted in subparagraph (8) of this paragraph, doors may be fitted with not more than 100 square inches of glass, which shall be of the wire inserted type.

(5) Vent grilles or louvers shall not be used in doors of this type.

(6) The bottoms of doors may be undercut not to exceed ½ inch above the door sill or top of approved deck covering. Rugs, and carpets, shall not pass through doorways, but linoleum and similar coverings may do so.

(7) Door frames shall be of rigid construction, and shall provide at least a ½ inch door stop at the sides and top, except:

(i) Double doors capable of independent operation and latching may have a clearance between the doors not to exceed ⅛ inch. However, if one door must always be closed first, a doorstop of at least ½ inch shall be provided for the second door.

(ii) Double swing doors, where permitted, may have a maximum clearance of ⅛ inch at the tops and sides.

(8) Doors opening out onto open decks shall either meet the applicable requirements of this paragraph, or they may be of hardwood having a minimum thickness of 1¾ inches. In any case, no restriction as to the area of glass will be made for such doors insofar as this subpart is concerned. Only glass of the wire-inserted type may be fitted in such doors opening onto safety areas from accommodation spaces containing combustible type furniture and service, cargo, and machinery spaces.

(9) Doors in stairway enclosures and Main Vertical Zone bulkheads shall, in addition to meeting the requirements of this paragraph, also meet the following requirements:

(i) Doors, other than those which are normally locked, such as from staterooms, fan rooms, lockers, etc., shall be of the self-closing type capable of closing against a 3½ degree list, and such doors shall be numbered in accordance with § 78.47-35 of this subchapter.

(ii) All doors, except those that are kept normally closed, shall be of a type which are capable of release from the control station and from a position at the door. The release mechanism shall be so designed that the door will automatically close in the event of disruption to the control system; however, approved power operated watertight doors will be considered acceptable for this purpose. Holdback hooks, or other means of permanently holding the door open, not subject to control station release, will not be permitted. When double swing doors are permitted, they shall have a latch arrangement which is automatically engaged by the operation of the door release system.

(iii) Double doors shall be so arranged that either door may be closed and latched independently.

(iv) For additional requirements for stairway doors, see § 72.05-20(s).

(c) Doors in "B" Class bulkheads shall meet the following requirements:

(1) Doors may be of solid or hollow steel or equivalent metal construction or may be of steel or equivalent metal frame with glass panes or may be of approved incombustible materials of such construction as specifically approved by the Commandant.

(2) No restriction as to the area of glass will be made for such doors, but all glass shall be of the wire-inserted type.

(3) The lower half of such doors may contain vent grilles or louvers with a net area not to exceed 2 square feet.

(4) Doors shall have a latch with a minimum throw of ⅜ inch which can be operated from either side of the door. Double swing doors, where permitted for the proper utility of the space, may have the latch normally inoperative.

(5) The bottoms of doors may be undercut not to exceed 1 inch above the door sill or top of approved deck covering. Rugs and carpets shall not pass through doorways but linoleum and similar covering may do so.

(6) Door frames shall be of rigid construction, and shall provide at least a ½ inch doorstop at the sides and top, except:

(i) Double doors capable of independent operation and latching may have a clearance between the doors not to exceed ⅛ inch. However, if one door must

always be closed first, a door stop of at least ½ inch shall be provided for the second door.

(ii) Double swing doors, where permitted, may have a maximum clearance of ⅛ inch at the tops and sides.

(d) Doors in bulkheads required to be Class C shall be of approved incombustible materials.

§ 72.05–30 Windows and airports.

(a) For the purpose of this subpart, all glass in windows or airports shall be at least ¼ inch thick. However, greater thickness may be required for strength purposes in certain locations. All glass shall be fitted in steel or equivalent metal frames and shall be retained by steel or equivalent metal glazing beads or angles.

(b) Where wire-inserted glass is required, and the single wire type is employed, the strands shall run horizontally and shall be not more than 2 inches apart.

(c) Windows in Class B–0 bulkheads shall be fitted with wire inserted glass. Such windows opening onto passageways may not extend below the normal height of the storm rails.

(d) Windows in Class B–15 bulkheads shall be fitted with wire inserted glass. In addition, such windows shall be fitted with a suitable steel or equivalent metal shutter capable of being operated manually as well as automatically by means of a fusible link.

(e) Windows in interior "A" Class bulkheads shall be fitted with suitable steel or equivalent metal shutter capable of being operated manually as well as automatically from the control station by the same system used for the fire doors as noted in § 72.05–25(b)(9)(ii). The metal shutter shall be insulated to meet the applicable bulkhead requirements.

(f) Windows or air ports opening onto lifeboat embarkation or lowering spaces from service, cargo, or machinery spaces, or from control or accommodation spaces other than those containing only incombustible veneers and trim and fire resistant furnishings, shall be fitted with wire inserted glass. Other windows or air ports opening onto open decks or enclosed promenades need not have wire inserted glass.

(g) Skylights to spaces containing auxiliary internal combustion machinery having an aggregate horsepower of 1,000 or more, and to boiler and main enginerooms, shall be capable of being closed from outside the space. If glass is fitted in such skylights, it shall be of the wire inserted type. The glass panels shall be fitted with permanently attached shutters of steel or equivalent metal.

§ 72.05–35 Hatch covers and shifting boards.

(a) Wood hatch covers may be used between cargo spaces. Hatch covers in other locations shall meet the requirements for deck construction noted in Tables 72.05–10 (f) and (g).

(b) Tonnage openings in "A" Class bulkheads shall be closed by means of steel plates.

§ 72.05–40 Insulation, other than for structural fire protection.

(a) Any insulation installed for heat and comfort, refrigeration (including air conditioning), or for any other purpose, and all material incidental to its installation, shall be approved Incombustible Materials. This paragraph shall not apply to such insulation installed in cargo spaces, refrigerated storerooms, individual refrigerator boxes, nor to pipe and machinery coverings or laggings within the machinery spaces.

§ 72.05–45 Paint.

(a) An excessive number of coats of paint will be discouraged unless noncombustible paint is used.

(b) Nitrocellulose or other highly flammable or noxious fume-producing paints or lacquers shall not be used.

§ 72.05–50 Ventilation.

(a) Where the term "duct" is used in this section, it shall include trunks, plenums, and any other type of ventilation piping, chambers, or duct work.

(b) Where automatic fire dampers are required, they shall be designed to operate at approximately 165 degrees F. for normal locations, and approximately 212 degrees F. for locations such as galleys. The dampers shall be so designed as to close against the anticipated draft in the duct. The damper shall be made accessible for periodic inspection by means of a hinged or bolted plate in the duct. The damper and the portion of duct containing the damper shall be constructed of at least ⅛ inch steel plate suitably stiffened. No insulation need be applied to the damper blade.

(c) Where ventilation ducts are required to meet bulkhead requirements, the space within the duct shall be considered to be the same as the space served by the ventilator, and the duct shall be insulated to meet the applicable requirements of Tables 72.05–10 (d) and 72.05–10(e).

(d) All ventilation systems shall be designed, where practicable, so that all ducts leading to the various enclosures are kept within the main vertical zones. No duct may serve spaces in more than one main vertical zone.

(e) Where of necessity, ducts pass through main vertical zone bulkheads, automatic fire dampers shall be fitted adjacent to the bulkhead. The duct between the bulkhead and the damper shall meet the applicable bulkhead requirements. The damper shall be fitted on at least one side of the bulkhead with a visible indicator showing whether the damper is in the open or closed position. The indicator may be connected to the manual operating device rather than the damper blade so that it might show as being open when it had automatically closed, but could never be open if the indicator showed it to be closed. The damper shall be capable of being manually closed from both sides of the bulkhead. The operating positions for the damper shall be marked as required by § 78.47–53 of this subchapter.

(f) Vent ducts serving stairway enclosures shall serve no other spaces.

(g) Ventilation ducts serving cargo or main machinery spaces which pass through accommodation spaces or safety areas shall be fitted with an automatic fire damper adjacent to the point of entry. Between the bulkhead or deck and the damper, and in addition, on vertical ducts for a distance of 6 feet above the damper, the duct shall meet the applicable bulkhead requirements.

(h) Exhausts from galleys shall meet the applicable bulkhead requirements. In addition, an automatic damper shall be installed in exhaust ducts over frying vats, etc.

(i) In all ventilation systems, manually operated dampers or other suitable means shall be provided in accessible locations, outside the spaces served by the system, for shutting off the passage of air in the event of fire; however, no dampers shall be placed in exhaust ducts from film lockers or projection rooms.

(j) For information regarding controls of electrically powered ventilation systems, see Subchapter J (Electrical Engineering) of this chapter.

§ 72.05–55 Furniture and furnishings.

(a) For the purpose of this subpart, rooms containing "fire resistant furnishings" will be considered to be those in which:

(1) All case furniture such as desks, wardrobes, dressing tables, bureaus, dressers, etc., shall be constructed entirely of approved incombustible materials; except that a combustible veneer not exceeding ⅛ inch may be used on the top surface of such articles.

(2) All free standing furniture such as chairs, sofas, tables, etc., shall be constructed with frames of approved incombustible materials.

(3) All draperies shall be of approved fire resistant fabrics.

(4) All rugs and carpets shall be of wool or other material having equivalent fire resistive qualities.

(b) Waste paper baskets shall be constructed of approved incombustible materials with solid sides and bottoms.

(c) Passageways and stairway enclosures shall contain only fire resistant furnishings. In addition, all upholstery and padding of chairs, sofas, etc., in these areas, shall be of approved fire resistant materials.

§ 72.05–60 Motion picture projection and equipment.

(a) Inasmuch as only acetate or slow burning film may be used, projection rooms and special film stowage rooms are not required.

§ 72.05–90 Vessels contracted for prior to May 26, 1965.

(a) Vessels of less than 100 gross tons on an international voyage, contracted for prior to November 19, 1952, shall meet the following requirements:

(1) Existing structure, arrangements, and materials previously approved will be considered satisfactory so long as they meet the minimum requirements of this paragraph and they are maintained in good condition to the satisfaction of the Officer in Charge, Marine Inspection. Minor repairs and alterations may be made to the same standard as the original construction.

(b) Vessels of 100 gross tons and over, contracted for prior to May 28, 1936, shall meet the following requirements:

(1) Existing structure, arrangements, and materials previously approved will be considered satisfactory so long as they meet the minimum requirements of this paragraph and are maintained in good condition to the satisfaction of the Officer in Charge, Marine Inspection. Minor repairs and alterations may be made to the same standards as the original construction.

(2) All vessels in ocean or coastwise service shall be fitted above the bulkhead deck with fire-resisting bulkheads and doors spaced not more than 131 feet apart which are capable of resisting the passage of flame for a period of at least 1 hour.

(3) All vessels with berth or stateroom accommodations for 50 or more passengers shall be fitted with an approved automatic sprinkling system unless deemed unnecessary by the Commandant. This system shall be so installed as to protect all enclosed parts of the vessel accessible to passengers or crew while the vessel is being navigated, except cargo holds, machinery spaces, and when of fire-resisting construction, toilets, bathrooms, and spaces of similar construction. Where, in the case of particular vessel, the Commandant does not consider the installation of an automatic water-sprinkling system necessary, such vessel shall be protected in such enclosed parts of the vessel as the Commandant shall deem necessary, with an automatic electric or pneumatic fire-detecting and alarm system, used singly or in combination, of a type approved by the Commandant.

(c) The provisions of this paragraph shall apply to vessels of 100 gross tons and over contracted for on or after May 28, 1936, but prior to May 26, 1965; and to vessels of less than 100 gross tons which are on international voyages and which were contracted for prior to May 26, 1965.

(1) Existing structure, arrangements, and materials previously approved will be considered satisfactory so long as they meet the minimum requirements of this paragraph and are maintained in good condition to the satisfaction of the Officer in Charge, Marine Inspection. Minor repairs and alterations may be made to the same standards as the original construction.

(2) The details shall be in general agreement with §§ 72.05–5 through 72.05–60 insofar as is reasonable and practicable.

(d) Vessels of less than 100 gross tons and not on an international voyage which carry more than 150 passengers, and which were contracted for prior to May 26, 1965, shall meet the following requirements:

(1) Existing structure, arrangements, and materials previously approved will be considered satisfactory so long as they are maintained in good condition to the satisfaction of the Officer in Charge, Marine Inspection. Minor repairs and alterations may be made to the same standards as the original construction.

Subpart 72.10—Means of Escape

§ 72.10–1 Application.

(a) The provisions of this subpart, with the exception of § 72.10–90, shall apply to all vessels contracted for on or after November 19, 1952. Vessels contracted for prior to November 19, 1952, shall meet the requirements of § 72.10–90.

§ 72.10–5 Two means required.

(a) There shall be at least two means of escape from all general areas accessible to the passengers or where the crew may be quartered or normally employed. At least one of these two means of escape shall be independent of watertight doors. For stairway continuity and general requirements for stairways on any vessel of 100 gross tons and over, or any vessel which carries more than 150 passengers, or any vessel on an international voyage, see § 72.05–20.

(b) Elevators shall not be considered as one of the required means of escape.

(c) Stairways serving only a space and a balcony to a space shall not be considered as one of the required means of escape.

§ 72.10–10 Location.

(a) The two means of escape shall be as remote as practicable so as to minimize the possibility of one incident blocking both escapes.

§ 72.10–15 Vertical ladders not acceptable.

(a) Verticle ladders and deck scuttles shall not in general be considered satisfactory as one of the required means of escape. However, where it is demonstrated that the installation of a stairway would be impracticable, a vertical ladder may be used as the second means of escape.

§ 72.10–20 No means for locking door.

(a) No means shall be provided for locking doors giving access to either of the 2 required means of escape, except that crash doors or locking devices, capable of being easily forced in an emergency, may be employed provided a permanent and conspicuous notice to this effect is attached to both sides of the door. This paragraph shall not apply to outside doors to deckhouses where such doors are locked by key only and such key is under the control of one of the vessel's officers.

§ 72.10–25 Stairway size.

(a) Stairways shall be of sufficient width to satisfactorily accommodate the number of persons having access to such stairs for escape purposes.

§ 72.10–30 Dead end corridors.

(a) Dead end corridors, or the equivalent, more than 40 feet in length shall not be permitted.

§ 72.10–35 Public spaces.

(a) In all cases, public spaces having a deck area of over 300 square feet shall have at least two exits. Where practicable, these exits shall give egress to different corridors, rooms, or spaces to minimize the possibility of one incident blocking both exits.

§ 72.10–40 Access to lifeboats.

(a) The stairways, corridors, and doors shall be so arranged as to permit a ready and direct access to the various lifeboat embarkation areas.

§ 72.10–45 Weather deck communications.

(a) Vertical communication shall be provided between the various weather decks by means of permanent inclined ladders. Where ladders are for the exclusive use of the crew for rapid communication, and do not form part of a normal escape route, vertical ladders may be employed.

§ 72.10–90 Vessels contracted for prior to November 19, 1952.

(a) Existing arrangements previously approved will be considered satisfactory so long as they are maintained in good condition to the satisfaction of the Officer in Charge, Marine Inspection. Minor repairs and alterations may be made to the same standards as the original design provided that in no case will a greater departure from the standards of §§ 72.10–5 through 72.10–45 be permitted than presently exists. Nothing in this paragraph shall be construed as exempting any vessel from having 2 suitable means of escape from all main compartments which are accessible to the passengers or where the crew are normally quartered or employed.

Subpart 72.15—Ventilation

§ 72.15–1 Application.

(a) The provisions of this subpart with the exception of § 72.15–90, shall apply to all vessels contracted for on or after November 19, 1952. Vessels contracted for prior to November 19, 1952, shall meet the requirements of § 72.15–90.

§ 72.15–5 Structural fire protection.

(a) See § 72.05–50 for ventilation requirements on vessels of 100 gross tons and over or vessels of any tonnage on an international voyage, pertaining to structural fire protection.

§ 72.15–10 Vessels using fuel having a flashpoint of 110 degrees F. or lower.

(a) Where liquid fuel having a flashpoint of 110 degrees F. or lower is used for main or auxiliary machinery or for starting purposes, the spaces containing such machinery or fuel tanks shall have natural supply and mechanical ventilation as required by this section.

(b) The requirements for the mechanical exhaust system shall be such as to assure the air changes as noted in Table

72.15-10 (b), depending upon the size of the space.

TABLE 72.15-10 (b)

Size of space, cubic feet		Minutes per air change
Over	Not over	
---	500	2
500	1,000	3
1,000	1,500	4
1,500	---	5

(c) Exhaust blower motors shall be outside of the ducts, and if mounted in any compartment required to be ventilated by this section, shall be of the explosion proof type. Blower blades shall be non-sparking with reference to their housings.

(d) Exhaust blower switches shall be located outside of any space required to be ventilated by this section, and shall be of the type interlocked with the ignition switch so that the blowers are started before the engine ignition is switched on. A red warning sign at the switch shall state that the blowers shall be operated prior to starting the engines for a sufficient time to insure at least one complete change of air in the compartments.

(e) The area of the ducts shall be such as to limit the air velocity to a maximum of 2,000 feet per minute. Ducts may be of any shape, provided that in no case shall 1 dimension exceed twice the other.

(f) At least 2 inlet ducts shall be located at 1 end of the compartment and they shall extend to the lowest part of the compartment or bilge on each side. Similar exhaust ducts shall be led to the mechanical exhaust system from the lowest part of the compartment or bilge on each side of the compartment at the end opposite from that at which the inlet ducts are fitted.

(g) All ducts shall be constructed of non-ferrous metal or galvanized ferrous metal not less than No. 22 USSG, intact and gastight from end to end and shall be of substantial construction. The ducts shall lead as direct as possible and be properly fastened and supported.

(h) All supply ducts shall be provided with cowls or scoops having a free area not less than twice the required duct area. When the cowls or scoops are screened, the mouth area shall be increased to compensate for the area of the screen wire. Dampers shall not be fitted in the supply ducts. Cowls or scoops shall be kept open at all times except when the stress of weather is such as to endanger the vessel if the openings are not temporarily closed. Supply and exhaust openings shall not be located where the natural flow of air is unduly obstructed, or adjacent to possible sources of vapor ignition, nor shall they be so located that exhaust air may be taken into the supply vents.

§ 72.15-15 Ventilation for closed spaces.

(a) All enclosed spaces within the vessel shall be properly vented or ventilated. Means shall be provided to close off all vents and ventilators.

(b) Means shall be provided for stopping all fans in ventilation systems serving machinery and cargo spaces and for closing all doorways, ventilators and annular spaces around funnels and other openings to such spaces, from outside these spaces, in case of fire.

§ 72.15-20 Ventilation for crew quarters and passenger spaces.

(a) All crew and passenger spaces shall be adequately ventilated in a manner suitable to the purpose of the space.

(b) On vessels of 100 gross tons and over, except for such spaces as are so located that under all ordinary conditions of weather, windows, ports, skylights, etc., and doors to passageways can be kept open, all crew spaces shall be ventilated by a mechanical system, unless it can be shown that a natural system will provide adequate ventilation. However, vessels which trade regularly in the tropics shall, in general, be fitted with a mechanical ventilation system.

§ 72.15-90 Vessels contracted for prior to November 19, 1952.

(a) Existing arrangements previously approved will be considered satisfactory so long as they are maintained in good condition to the satisfaction of the Officer in Charge, Marine Inspection. Minor repairs and alterations may be made to the same standards as the original design provided that in no case will a greater departure from the standards of §§ 72.15-5 through 72.15-20 be permitted than presently exists.

Subpart 72.20—Accommodations for Officers and Crew

§ 72.20-1 Application.

(a) The provisions of this subpart, with the exception of § 72.20-90, shall apply to all vessels of 100 gross tons and over contracted for on or after November 19, 1952. Vessels of 100 gross tons and over contracted for prior to November 19, 1952, shall meet the requirements of § 72.20-90.

(b) Vessels of less than 100 gross tons shall meet the applicable requirements of this subpart insofar as is reasonable and practicable.

§ 72.20-5 Intent.

(a) It is the intent of this subpart that the accommodations provided for officers and crew on all vessels shall be securely constructed, properly lighted, heated, drained, ventilated, equipped, located, arranged, and where practicable, shall be insulated from undue noise and effluvia.

(b) The crew referred to in this subpart includes all persons, except the licensed officers, regularly employed on board any vessel. Where the requirements for the accommodations of licensed officers are not otherwise specified, they shall be at least equivalent to that indicated for the crew.

(c) For the purpose of this subpart, the term "crew spaces" shall include sleeping rooms, messrooms, recreational rooms, toilet and shower spaces, etc., which are intended for the exclusive use of the crew.

72.20-10 Location of crew spaces.

(a) Crew spaces shall be located, where practicable, so that the maximum amount of fresh air and light are obtainable, having due regard to the service of the vessel and the requirements of other space users.

(b) Crew quarters shall not be located farther forward in a vessel than a vertical plane located at 5 percent of the vessel's length abaft the forward side of the stem at the designed summer load water line. However, for vessels in other than ocean or coastwise service, this distance need not exceed 28 feet. For the purpose of this paragraph, the length shall be as defined in § 43.15-1 of Subchapter E (Load Lines) of this chapter. No section of the deck of the crew spaces shall be below the deepest load line, except that in special cases, the Commandant may approve such an arrangement: *Provided*, That in no case shall the deck head of the crew space be below the deepest load line.

(c) Hawse pipes or chain pipes shall not pass through crew spaces.

(d) There shall be no direct communication, except through solid, close fitted doors or hatches between crew spaces and chain lockers, cargo or machinery spaces.

(e) There shall be no access, vents, or sounding tubes from fuel or cargo oil tanks opening into crew spaces, except that sounding tubes and access openings may be located in corridors.

(f) Where practicable, crew spaces shall be located entirely separate and independent of spaces allotted to passengers or licensed officers.

§ 72.20-15 Construction.

(a) See subpart 72.05 for requirements on vessels of 100 gross tons and over or vessels of any tonnage on an international voyage pertaining to structural fire protection.

(b) All crew spaces are to be constructed in a manner suitable for the purpose for which they are intended. The bulkheads separating the crew space from cargo and machinery spaces, lamp and paint rooms, storerooms, drying rooms, washrooms, and toilet spaces shall be made odorproof where deemed necessary by the Commandant.

(c) Toilet spaces, except when provided as private or semiprivate facilities, shall be so built, fitted, and situated, that no odor from them will readily enter other crew spaces.

(d) Where shell or unsheathed weather decks form boundaries of crew spaces, suitable protective coverings shall be applied to prevent formation or accumulation of moisture.

(e) Where crew spaces adjoin or are immediately above spaces such as galleys, machinery spaces or casings, donkey boilerrooms, etc., they shall be suitably protected from the heat by approved insulation.

(f) The interior sides and deck heads of crew spaces shall be covered with enamel, paint, or other material light in color.

(g) Crew spaces shall be properly drained where considered necessary.

(h) All washrooms and toilet rooms shall be properly drained and so constructed and arranged that they can be kept in a clean, workable, and sanitary condition. The scuppers shall be located in the lowest part of the spaces, due consideration being given to the average trim of the vessel.

§ 72.20–20 Sleeping accommodations.

(a) *Arrangements.* (1) Separate sleeping accommodations are to be provided for the deck, engine, and steward groups of the crew.

(2) Each watch of seamen, firemen, or similar ratings on duty in watches is to be provided with separate sleeping room or rooms unless the total space for accommodations makes this impracticable.

(3) Where practicable, each licensed officer shall be provided with a separate stateroom.

(b) *Size.* (1) Sleeping accommodations for the crew shall be divided into rooms, no one of which shall berth more than 4 persons, except that on passenger ships requiring a large personnel in the steward's department, rooms may be arranged to accommodate not more than 10 such persons.

(2) Each room shall be of such size that there are at least 30 square feet of deck area and a volume of at least 210 cubic feet for each person accommodated, except where more than four persons are berthed in one room, in which case the minimum may be 24 square feet of deck area and a volume of 168 cubic feet for each person. The clear head room shall be not less than 6 feet 3 inches. In measuring sleeping quarters allocated to crews of vessels, any equipment contained therein for the use of the occupants is not to be deducted from the total volume or from the deck area.

(c) *Equipment.* (1) Each person shall have a separate berth and not more than 1 berth shall be placed above another. The berths shall have a framework of metal or other hard, smooth material not likely to corrode or harbor vermin, and shall be so arranged that they provide ample room for easy occupancy. The overall size of a berth shall not be less than 30 inches wide by 76 inches long, except by special permission of the Commandant. Where berths adjoin, they shall be divided by a partition not less than 18 inches in height. Where 2 tiers of berths are fitted, the bottom of the lower must not be less than 12 inches above the deck, and the bottom of the upper must not be less than 2 feet 6 inches both from the bottom of the lower and from the deck overhead. The berths shall not be obstructed by pipes, ventilating ducts, or other installations.

(2) A locker of metal or other hard, smooth material shall be provided for each person accommodated in a room. Each locker shall be not less than 300 square inches in cross section area and 60 inches high. It shall be so placed as to be readily accessible. The interior of the locker shall be so arranged as to facilitate the proper stowage of clothes.

§ 72.20–25 Washrooms and toilet rooms.

(a) There shall be provided at least 1 toilet, 1 washbasin, and 1 shower or bathtub for each 8 members or portion thereof in the crew to be accommodated. The crew to be accommodated shall include all members who do not occupy rooms to which private or semiprivate facilities are attached.

(b) Under the following conditions, the toilet and washing facilities for the specific groups of the crew indicated shall be located in spaces separate from the facilities for other crewmembers; and shall be provided for that group in the ratios required by paragraph (a) of this section.

(1) The members of the engine department, where their number, exclusive of licensed officers, and others separately provided for, exceeds eight.

(2) The members of the steward's department, exclusive of those separately provided for, where their number exceeds eight.

(3) All female members of the crew.

(c) The toilet rooms and washrooms shall be located convenient to the sleeping quarters of the crew to which they are allotted but shall not open directly into such quarters except when they are provided as private or semiprivate facilities.

(d) All washbasins, showers, and bathtubs shall be equipped with proper plumbing, including hot and cold running water. Washbasins may be located in the crew sleeping quarters.

(e) The toilet rooms shall be separate from the washrooms and at least 1 washbasin shall be fitted in each toilet room, except where private or semiprivate facilities are provided and washbasins are installed in sleeping rooms.

(1) All toilets shall be installed with proper plumbing for flushing. Toilets shall be provided with seats of the open front type. Urinals may be fitted in toilet rooms, if desired, but no reduction in the required number of toilets will be made therefor.

(2) Where more than one toilet is located in a space or compartment, each toilet shall be separated by partitions, which shall be open at the top and bottom for ventilation and cleaning purposes.

§ 72.20–30 Messrooms.

(a) Messrooms shall be located as near to the galley or suitably equipped serving pantries as is practicable except where messroom is equipped with a steam table. The messrooms shall be of such size as to seat the number of persons normally scheduled to be eating at one time.

(b) Messrooms shall be properly equipped with tables, seats, and other necessary equipment and shall be so arranged as to permit easy access to each seat.

§ 72.20–35 Hospital space.

(a) Each vessel, which in the ordinary course of its trade makes voyages of more than 3 days duration between ports and which carries a crew of 12 or more, shall be provided with a hospital space. This space shall be situated with due regard to the comfort of the sick so that they may receive proper attention in all weathers.

(b) The hospital shall be suitably separated from other spaces and shall be used for the care of the sick and for no other purpose.

(c) The entrance shall be of such width and in such a position as to admit a stretcher case readily. Berths shall be of metal and may be in double tier, provided the upper berth is hinged and arranged to be secured clear of the lower berth when not in use. At least one berth shall be so arranged that it can be made accessible from both sides when necessary.

(d) The hospital shall be fitted with berths in the ratio of 1 berth to every 12 members of the crew or portion thereof who are not berthed in single occupancy rooms, but the number of berths need not exceed 6.

(e) The hospital shall have a toilet, washbasin, and bathtub or shower conveniently situated. Other necessary suitable equipment of such character as clothes locker, table, seat, etc., shall be provided.

§ 72.20–40 Other spaces.

(a) Sufficient facilities, depending upon the number of the crew, shall be provided where the crew may wash their own clothes. There shall be at least 1 tub or sink, fitted with the necessary plumbing, including hot and cold running water.

(b) Clothes drying facilities or space shall be provided for the needs of the crew.

(c) A space or spaces of adequate size shall be available on an open deck to which the crew has access when off duty.

(d) Recreation accommodations shall be provided. Where messrooms are used for this purpose, they shall be suitably planned.

§ 72.20–45 Lighting.

(a) All crew spaces shall be adequately lighted in accordance with the requirements of Subchapter J (Electrical Engineering) of this chapter.

(b) Berth lights shall be provided for each member of the crew.

§ 72.20–50 Heating.

(a) All crew spaces shall be adequately heated in a manner suitable to the purpose of the space.

(b) The heating system will be considered satisfactory if it is capable of maintaining a minimum temperature of 70 degrees F. under normal operating conditions without undue curtailment of the ventilation.

(c) Radiators and other heating apparatus shall be so placed, and where necessary shielded, as to avoid risk of fire or danger or discomfort to the occu-

pants. Pipes leading to radiators or heating apparatus shall be lagged where the pipes create a hazard to persons occupying the space.

§ 72.20–55 Insect screens.

(a) Except in such areas as are considered to be insect free, provisions shall be made to protect the crew quarters against the admission of insects. This may be accomplished by the fitting of suitable screens to ventilating skylights, air ports, ventilators, and doors to unscreened spaces and the open deck, or by other methods.

§ 72.20–90 Vessels contracted for prior to November 19, 1952.

(a) Vessels of less than 100 gross tons, contracted for prior to November 19, 1952, shall meet the general intent of § 72.20–5 and in addition shall meet the following requirements:

(1) Existing structure, arrangements, materials, and facilities, previously accepted or approved will be considered satisfactory so long as they are maintained in a suitable condition to the satisfaction of the Officer in Charge, Marine Inspection. Minor repairs and alterations may be made to the same standard as the original construction.

(b) Vessels of 100 gross tons and over, contracted for prior to March 4, 1915, shall meet the requirements of this paragraph.

(1) Existing structure, arrangements, materials, and facilities, previously approved will be considered satisfactory so long as they are maintained in a suitable condition to the satisfaction of the Officer in Charge, Marine Inspection. Minor repairs and alterations may be made to the same standard as the original construction provided that in no case will a greater departure from the standards of §§ 72.20–5 through 72.20–55 be permitted than presently exists.

(c) Vessels of 100 gross tons and over, contracted for on or after March 4, 1915, but prior to January 1, 1941, shall meet the requirements of this paragraph.

(1) Existing structure, arrangements, materials, and facilities, previously accepted or approved will be considered satisfactory so long as they are maintained in a suitable condition to the satisfaction of the Officer in Charge, Marine Inspection. Minor repairs and alterations may be made to the same standard as the original construction.

(2) Where reasonable and practicable, a minimum of 1 toilet, shower, and washbasin shall be provided for each 10 members of the crew or fraction thereof.

(3) Crew spaces shall have a volume of at least 120 cubic feet and a deck area of at least 16 square feet for each person accommodated.

(4) Each crewmember shall have a separate berth, and berths may not be placed more than two high.

(5) Each vessel, which in the ordinary course of its trade makes a voyage of more than 3 days' duration between ports and which carries a crew of 12 or more persons, shall be provided with a suitable hospital space for the exclusive use of the sick or injured. Berths shall be provided in the ratio of 1 berth for each 12 members of the crew or fraction thereof, but the number of berths need not exceed 6.

(6) The crew spaces shall be securely constructed, properly lighted, heated, drained, ventilated, equipped, located, and arranged, and where practicable shall be insulated from undue noise and effluvia.

(d) Vessels of 100 gross tons and over, contracted for on or after January 1, 1941, but prior to November 19, 1952, shall meet the requirements of this paragraph.

(1) Existing structure, arrangements, materials, and facilities, previously accepted or approved will be considered satisfactory so long as they are maintained in a suitable condition to the satisfaction of the Officer in Charge, Marine Inspection. Minor repairs and alterations may be made to the same standard as the original construction.

(2) Washrooms and toilet rooms:

(i) There shall be a minimum of one toilet, shower, and washbasin for each eight members of the crew or fraction thereof who are not accommodated in rooms having attached private or semiprivate facilities.

(ii) Separate facilities shall be provided for the engineroom, deck, or stewards' department when the number of crew in that department, exclusive of officers, exceeds eight.

(iii) Toilet rooms shall be separate from the washrooms. At least one washbasin shall be installed in each toilet room.

(iv) Toilets shall be provided with seats of the open front type. Urinals may be fitted in toilet rooms, if desired, but no reduction will be made in the required number of toilets.

(v) Washbasins, showers, and bathtubs if substituted for showers, shall be equipped with proper plumbing, including hot and cold running water.

(3) Crew spaces shall have a volume of at least 120 cubic feet and a deck area of at least 16 square feet for each person accommodated.

(4) Each crewmember shall have a separate berth, and berths may not be placed more than two high.

(5) Each vessel, which in the ordinary course of its trade makes a voyage of more than 3 days' duration between ports and which carries a crew of 12 or more persons, shall be provided with a suitable hospital space for the exclusive use of the sick or injured. Berths shall be provided in the ratio of 1 berth for each 12 members of the crew or fraction thereof, but the number of berths need not exceed 6.

(6) The crew spaces shall be securely constructed, properly lighted, heated, drained, ventilated, equipped, located, and arranged, and where practicable shall be insulated from undue noise and effluvia.

Subpart 72.25—Passenger Accommodations

§ 72.25–1 Application.

(a) The provisions of this subpart shall apply to all vessels.

§ 72.25–5 Steerage passengers.

(a) Where the total area provided for the exclusive use of a class of passengers is less than 36 square feet per passenger, the provisions of the Steerage Passenger Act of August 2, 1882, as amended, 46 U. S. C. 151, which is administered and enforced by the Bureau of Customs, shall be complied with, for any vessel engaged in a voyage from any port or place in the United States to any port or place in a foreign country or dominion (ports and places in foreign territory contiguous to the United States excepted) or conversely. For the purpose of computing the number of passengers, children under 1 year of age shall not be counted, and two children between the ages of one and eight shall be counted as one passenger.

§ 72.25–10 Location of passenger quarters.

(a) The deck forming the deckhead of passenger quarters between adjacent watertight bulkheads shall not be below the deepest load line at any point within the watertight compartment in question.

§ 72.25–15 Passenger accommodations for excursion boats, ferryboats, and passenger barges.

(a) Except as specifically excluded by this section, separate public toilet spaces shall be provided for male and female passengers with at least the minimum equipment in each based upon the number of passengers permitted to be carried as set forth in Table 72.25–15(a).

TABLE 72.25–15 (a)

Number of passengers		Toilets	Washbasins
Over	Not over		
-------	100	1	1
100	300	2	1
300	500	3	2
500	1,000	4	2
1,000	1,500	5	3
1,500	2,000	6	3
2,000	2,500	7	4
2,500	3,000	8	4
3,000	3,500	9	5
3,500	4,000	10	5
4,000	---------	(1)	(1)

1 Additional facilities by extrapolation.

(b) In the men's spaces, urinals may be substituted for toilets, provided at least one-half the required toilets are fitted.

(c) On ferry boats and barges having a short run, passenger toilet facilities need not be fitted.

Subpart 72.40—Rails and Guards

§ 72.40–1 Application.

(a) The provisions of this subpart, with the exception of § 72.40–90, shall apply to all vessels contracted for on or

after November 19, 1952. Vessels contracted for prior to November 19, 1952, shall meet the requirements of § 72.40–90.

§ 72.40–5 Where rails required.

(a) Rails or equivalent protection shall be installed near the periphery of all weather decks accessible to passengers or crew. The height and construction of such rails shall be as required by this section. The courses of the rails shall be approximately evenly spaced, and on vessels contracted for on or after January 1, 1955, the space between rail courses shall not exceed 18 inches.

(b) Such rails on decks accessible to passengers shall be in at least three courses and shall be at least 42 inches high, except:

(1) Where the height of the rails interferes with the business of the vessel, as in the case of a sport fishing vessel, other arrangements may be specifically approved by the Commandant: *Provided*, That in general the effective rail or bulwark height above the deck on which the passengers stand shall be at least 30 inches.

(c) On the passenger decks of ferry boats, excursion vessels, and vessels of a similar type, the space below the top of the rail shall be fitted with suitable wire mesh or the equivalent. Depending upon the type of construction, the lower rail courses may not be required.

(d) All other such rails shall be at least 36 inches high and shall be in at least three courses, approximately evenly spaced, except that on vessels contracted for prior to January 1, 1957, the rails may be in two courses.

§ 72.40–10 Storm rails.

(a) Suitable storm rails shall be installed in all passageways and at the deckhouse sides where passengers or crew might have normal access. Storm rails shall be installed on both sides of passageways which are 6 feet or more in width.

§ 72.40–15 Vehicular ferries.

(a) On vehicular ferries, suitable chains, cables, or other barriers shall be installed at the ends of the vehicle runways. In addition, suitable gates, rails, or other devices shall be installed as a continuation of the regularly required rails.

§ 72.40–20 Guards in dangerous places.

(a) Suitable covers, guards, or rails shall be installed in way of all exposed and dangerous places such as gears, machinery, etc.

§ 72.40–90 Vessels contracted for prior to November 19, 1952.

(a) Existing structure, arrangements, materials, and facilities previously approved will be considered satisfactory so long as they are maintained in good condition to the satisfaction of the Officer in Charge, Marine Inspection. Minor repairs and alterations may be made to the same standards as the original construction provided that in no case will greater departure from the standards of §§ 72.40–5 through 72.40–20 be permitted than presently exists.

PART 73—WATERTIGHT SUBDIVISION

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73.45–1 General.
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Subpart 73.90—Vessels Contracted for Prior to May 26, 1965

73.90–1 Requirements.

AUTHORITY: The provisions of this Part 73 issued under R.S. 4405, as amended, 4462, as amended; 46 U.S.C. 375, 416. Interpret or apply R.S. 4417, as amended, 4418, as amended, 4426, as amended, 4488, as amended, 4490, as amended, sec. 3, 24 Stat. 129, as amended, sec. 10, 35 Stat. 428, as amended, 41 Stat. 305, as amended, sec. 2, 45 Stat. 1493, as amended, sec. 2, 49 Stat. 888, as amended, sec. 5, 49 Stat. 1384, as amended, secs. 1, 2, 49 Stat. 1544, 1545, as amended, sec. 3, 54 Stat. 347, as amended, sec. 3, 70 Stat. 152, sec. 3, 68 Stat. 675; 46 U.S.C. 391, 392, 404, 481, 482, 483, 395, 363, 85a, 88a, 369, 367, 1333, 390b, 50 U.S.C. 198; E.O. 11239, July 31, 1965, 30 F.R. 9671, 3 CFR, 1965 Supp. Treasury Department Orders 120, July 31, 1950, 15 F.R. 6521; 167–14, Nov. 26, 1954, 19 F.R. 8026; 167–20, June 18, 1956, 21 F.R. 4894; CGFR 56–28, July 24, 1956, 21 F.R. 5659; 167–38, Oct. 26, 1959, 24 F.R. 8857; 167–48, Oct. 19, 1962, 27 F.R. 10504.

Subpart 73.01—Application

§ 73.01–1 General.

(a) The provisions of this part, with the exception of Subpart 73.90, shall apply to all vessels contracted for on or after May 26, 1965. Vessels contracted for prior to May 26, 1965, shall meet the requirements of Subpart 73.90.

(b) The provisions of this part shall apply to vessels subject to the act of May 10, 1956 (46 U. S. C. 390–390g), in accordance with the policies stated in § 70.05–15 of this subchapter.

Subpart 73.05—Definitions

§ 73.05–1 Subdivision load line.

(a) A subdivision load line is a waterline used in determining the subdivision of the ship.

§ 73.05–2 Deepest subdivision load line.

(a) The deepest subdivision load line is the waterline which corresponds to the greatest draft permitted by the subdivision requirements which are applicable.

§ 73.05–3 Length of the vessel.

The length of the vessel is the length measured between perpendiculars taken at the extremities of the deepest subdivision load line.

§ 73.05–4 Breadth of the vessel.

The breadth of the vessel is the extreme width from outside of frame to outside of frame at or below the deepest subdivision load line. On wood vessels, measurements should be taken to outside of planking.

§ 73.05–5 Bulkhead deck.

The bulkhead deck is the uppermost deck up to which the transverse watertight bulkheads are carried.

§ 73.05–6 Margin line.

(a) The margin line is a line drawn at least 3 inches below the upper surface of the bulkhead deck at side where the bulkhead deck is continuous; where the bulkhead deck is not continuous, an assumed continuous margin line shall be used which at no point is less than 3 inches below the top of the deck at side to which the bulkheads concerned and the shell are carried watertight.

(b) In the case of vessels with continuous bulkhead decks, where the average value of the sheer at bow and stern is less than 12 inches, a modified margin line 3 inches below the top of deck at the ends but lowered amidships to the position indicated in Table 73.05–6(b) is to be used.

TABLE 73.05–6(b)

Average value of sheer at bow and stern (inches)	Required position of margin line below top of deck, at side, amidships (inches)
12	3
6	6
0	9

(1) Interpolation is required for intermediate values not shown in Table 73.05–6(b).

(2) The modified margin line shall be parabolic through the midship and end points indicated in this paragraph. Margin lines so determined are based upon the assumption that the bulkhead deck is continuous and has existing parabolic sheer. Where this is not the case, the margin line shall be such as to give at least a standard of safety equivalent to the standard described in this paragraph.

§ 73.05–7 Draft.

The draft is the vertical distance from the molded base line amidships to the subdivision load line in question.

§ 73.05–8 Permeability.

The permeability of a space is the percentage of that space which can be occupied by water.

§ 73.05–9 Volume.

The volume of a space which extends above the margin line shall be measured only to the height of that line. In all cases, volumes shall be calculated to molded lines; linear dimensions are to be taken in feet and volumes in cubic feet.

§ 73.05–10 Machinery space.

(a) The machinery space is to be taken as extending from the molded base line to the margin line and between the extreme main transverse watertight bulkheads bounding the spaces containing the main and auxiliary propelling machinery, boilers serving the needs of propulsion, and all permanent coal bunkers. In the case of unusual arrangements the Commandant may define the limits of the machinery space.

§ 73.05–11 Passenger spaces.

(a) Passenger spaces are those which are provided for the accommodation and use of passengers, excluding baggage, store, provision and mailrooms. However, for the purpose of § 73.10–5, crew spaces and all other spaces which, in the full load condition, normally contain no substantial quantity of cargo, coal, oil fuel, baggage, stores, provisions, or mail are to be treated as passenger spaces.

§ 73.05–12 Floodable length.

The floodable length at a given point in the length of the vessel is the maximum portion of the length of the vessel, having its center at the point in question, which can be flooded without the vessel being submerged beyond the margin line. The floodable length at any point in the length of the vessel shall be determined by a method of calculation which takes into consideration the form, draft and other characteristics of the vessel, and based on the definite assumptions of permeability as set forth in §§ 73.10–5 or 73.15–1.

Subpart 73.10—Rules for Subdivision—Vessels on International Voyages and Vessels of 150 Gross Tons and Over in Ocean or Coastwise Service

§ 73.10–1 Application.

(a) The provisions of §§ 73.10–3 through 73.10–60 apply to all vessels on international voyages and vessels of 150 gross tons and over in ocean or coastwise service with certain exceptions with respect to vessels on short international voyages and permitted under § 75.10–10 of this subchapter to carry a number of persons on board in excess of the lifeboat capacity provided.

(b) Section 73.10–65 gives the provisions applicable to these latter vessels, which carry a number of persons on board in excess of the lifeboat capacity provided.

§ 73.10–3 General.

(a) Vessels shall be as efficiently subdivided as is possible having regard to the nature of the service for which they are intended. The degree of subdivision shall vary with the length of the vessel and with the service, in such manner that the highest degree of subdivision corresponds with the ships of greatest length, primarily engaged in the carriage of passengers.

§ 73.10–5 Permeability.

(a) *General.* In determining the floodable length, a uniform average permeability shall be used throughout the whole length of each of the following portions of the vessel below the margin line:

(1) The machinery space.

(2) The portion forward of the machinery space.

(3) The portion aft of the machinery space.

(b) *Machinery space.* (1) The uniform average permeability throughout the machinery space shall be determined from the formula:

$$85+10\frac{(a-c)}{v} \qquad (1)$$

where:

a = volume of the passenger spaces, as defined in § 73.05–11, which are situated below the margin line within the limits of the machinery space.

c = volume of between deck spaces below the margin line within the limits of the machinery space which are appropriated to cargo, coal, or stores, except as provided by § 73.05–11.

v = whole volume of the machinery space below the margin line.

(2) Where it is shown to the satisfaction of the Commandant, U.S. Coast Guard, that the average permeability, as determined by detailed calculation, is less than that given by the formula, the calculated value may be substituted. For the purposes of such calculation, the permeabilities of passenger spaces, as defined in § 73.05–11 shall be taken as 95, that of all cargo, coal, and store spaces as 60, and that of double-bottom, oil-fuel, and other tanks at such values as may be approved in each case by the Commandant.

(c) *Portion forward and aft of machinery space.* (1) The uniform average permeability throughout the portion of the vessel before or abaft the machinery space shall be determined from the formula:

$$63 \text{ plus } 35\frac{a}{v} \qquad (2)$$

where:

a = volume of the passenger spaces, as defined in § 73.05–11, which are situated below the margin line before or abaft the machinery space.

v = whole volume of the portion of the vessel below the margin line before or abaft the machinery space.

(d) *Other arrangements.* (1) In the case of unusual arrangements, the Commandant may allow, or require, a detailed calculation of average permeability for the portions before or abaft the machinery spaces. For the purpose of such calculations, the permeability of passenger spaces as defined in § 73.05–11, shall be taken as 95, that of spaces containing machinery as 85, that of all cargo, coal, and store spaces as 60, and that of double bottoms, oil fuel, and other tanks at such values as may be approved in each case by the Commandant.

(e) *'Tween deck compartment.* (1) If a 'tween deck compartment between two watertight transverse bulkheads contains any passenger or crew space, the whole of that compartment, less any

space completely enclosed within permanent steel bulkheads and appropriated to other purposes, shall be regarded as passenger space. If, however, the passenger or crew space in question is completely enclosed with permanent steel bulkheads, only the space so enclosed need be considered as passenger space.

§ 73.10–10 Factor of subdivision.

(a) The maximum permissible length of a compartment having its center at any point in the vessel's length is obtained from the floodable length by multiplying the latter by an appropriate factor called the factor of subdivision. Where the required factor of subdivision is .50 or less, the combined length of any two adjacent main compartments shall not exceed the floodable length.

(b) The factor of subdivision shall depend on the length of the vessel, and for a given length shall vary according to the nature of the service for which the vessel is intended. It shall decrease in a regular and continuous manner as the length of the vessel increases, and from a factor A, applicable to vessels primarily engaged in the carriage of cargo, to a factor B applicable to vessels primarily engaged in the carriage of passengers.

(1) The variations of the factors A and B shall be expressed by the following formulas where L is the length of the vessel in feet as defined in § 73.05–3:

$$A=\frac{190}{L-160}\text{ plus }0.18\ (L=392\text{ and upward}) \quad (1)$$

$$B=\frac{94}{L-85}\text{ plus }0.18\ (L=200\text{ and upward}) \quad (2)$$

§ 73.10–15 Criterion of service.

(a) For a vessel of given length the appropriate factor of subdivision shall be determined by the Criterion of Service Numeral (hereinafter called the "Criterion Numeral") as given by the following formula:

$$C_s=60\frac{M+2P}{V}+30{,}000\frac{N}{L^2} \quad (1)$$

where:

C_s = the Criterion Numeral.
L = length of the vessel in feet, as defined in § 73.05–3.
M = the volume of the machinery space, as defined in § 73.05–10, with the addition thereto of the volume of any permanent oil fuel bunkers which may be situated above the inner bottom and before or abaft the machinery space.
P = the whole volume of the passenger spaces below the margin line, as defined in § 73.05–11.
V = the whole volume of the vessel below the margin line.
N = number of passengers for which the vessel is to be certificated.

§ 73.10–20 Formulas for factor of subdivision.

(a) The subdivision abaft the fore peak of vessels 392 feet or more in length having a Criterion Numeral of 23 or less shall be governed by the factor A given by § 73.10–10(b)(1), of those having a Criterion Numeral of 123 or more by the factor B given by § 73.10–10(b)(1); and of those having a Criterion Numeral between 23 and 123 by the factor F obtained by linear interpolation between the factors A and B, using the formula:

$$F=A-\frac{(A-B)\times(C_s-23)}{100} \quad (1)$$

(b) The subdivision abaft the fore peak of vessels less than 392 feet, but not less than 200 feet in length, and having a Criterion Numeral equal to S, where

$$S=\frac{10904-25L}{48} \quad (2)$$

shall be governed by the factor unity; of those having a Criterion Numeral of 123 or more by the factor B given by § 73.10–10(b)(1); and of those having a Criterion Numeral between S and 123 by the factor obtained by linear interpolation between unity and the factor B, using the formula:

$$F=1-\frac{(1-B)\ (C_s-S)}{123-S} \quad (3)$$

(c) The subdivision abaft the fore peak of vessels less than 392 feet, but not less than 200 feet, in length and having a Criterion Numeral less than S, and of all ships less than 200 feet in length shall be governed by the factor unity, unless it is shown to the satisfaction of the Commandant to be impracticable to comply with this factor in any part of the vessel, in which case the Commandant may allow such relaxation as may appear to be justified having regard to all the circumstances.

§ 73.10–23 Vessels especially required to have a factor of subdivision not more than 0.5.

(a) Irrespective of the results of application of § 73.10–20, any vessel 430 feet in length or longer shall have a factor of subdivision of not more than 0.5 if the value of "X" as given by either of the following formulae is equal to or exceeds the values given in Table 73.10–23(a), whichever is the greater:

$$X=\frac{(M+2P)}{V}\text{ or }\frac{(M+2P_1)}{V+P_1-P}$$

where:

M = the volume of the machinery space, as defined in § 73.05–10, with the addition thereto of the volume of any permanent oil fuel bunkers which may be situated above the inner bottom and before or abaft the machinery space.
P = the whole volume of the passenger spaces below the margin line, as defined in § 73.05–11.
V = the whole volume of the vessel below the margin line.
P_1 = $0.6LN$, but not more than the sum of P and the whole volume of the actual passenger spaces above the margin line or $0.4LN$, whichever is less.
L = length of the vessel in feet, as defined in § 73.05–3.
N = number of passengers for which the vessel is to be certificated.

TABLE 73.10-23(a)

L[1]	"X"
430	1.336
440	1.283
450	1.230
460	1.174
470	1.117
480	1.060
490	1.002
500	.944
510	.885
520	.826
530	.766
540	.706
550	.645
554 and up	.625

[1] Interpolate for intermediate values.

§ 73.10–25 Stepped bulkhead decks.

(a) Where in a portion or portions of a vessel the watertight bulkheads are carried to a higher deck than in the remainder of the vessel, and it is desired to take advantage of this higher extension of the bulkheads in calculating the floodable length, separate margin lines may be used for each such portion of the ship provided:

(1) The sides of the vessel extend throughout the vessel's length to the deck corresponding to the upper margin line and all openings in the shell plating below this deck throughout the length of the vessel meet the conditions for side openings below the margin line.

(2) The two compartments adjacent to the "step" in the bulkhead deck shall each be within the permissible length corresponding to their respective margin lines and, in addition, their combined length, shall not exceed twice the permissible length based on the lower margin line.

§ 73.10–30 Compartment exceeding permissible length.

(a) A compartment may exceed the permissible length determined by this subpart provided the combined length of each pair of adjacent compartments to which the compartment in question is common does not exceed either the floodable length or twice the permissible length, whichever is the less.

(b) If one of the two adjacent compartments is situated inside the machinery space, and the second is situated outside the machinery space, and the average permeability of the portion of the vessel in which the second is situated differs from that of the machinery space, the combined length of the two compartments shall be adjusted to the mean average permeability of the two portions of the vessel in which the compartments are situated.

§ 73.10–35 Additional subdivision at forward end.

(a) In vessels 330 feet in length and upward, one of the main transverse bulkheads abaft the forepeak shall be fitted at a distance from the forward perpendicular which is not greater than the permissible length.

§ 73.10–40 Stepped bulkheads.

(a) A main transverse bulkhead may be stepped provided that it meets one of the following conditions:

(1) The combined length of the two compartments, separated by the bulkhead in question, does not exceed either 90 percent of the floodable length or twice the permissible length, except that in ships having a factor of subdivision greater than .9, the combined length of the two compartments in question shall not exceed the permissible length.

(2) Additional subdivision is provided in way of the step to maintain the same measure of safety as that secured by a plane bulkhead.

(3) The compartment over which the step extends does not exceed the permissible length corresponding to a margin line taken 3 inches below the step.

§ 73.10–45 Recessed bulkheads.

(a) A main transverse bulkhead may be recessed provided that all parts of the recess lie inboard of vertical surfaces on both sides of the vessel, situated at a distance from the shell plating equal to one-fifth the breadth of the vessel, as defined in § 73.05–4, and at right angles to the centerline at the level of the deepest subdivision load line. Any part of a recess which lies outside these limits shall be dealt with as a step in accordance with § 73.10–40.

§ 73.10–50 Equivalent plane bulkheads.

(a) Where a main transverse bulkhead is recessed or stepped, an equivalent plane bulkhead shall be used in determining the subdivision.

§ 73.10–55 Minimum spacing of bulkheads.

(a) If the distance between two adjacent main transverse bulkheads, or their equivalent plane bulkheads, or the distance between the transverse planes passing through the nearest stepped portions of the bulkheads, is less than 10 feet plus 3 percent of the length of the vessel, or 35 feet whichever is less, only one of these bulkheads shall be regarded as forming a part of the subdivision of the vessel in accordance with the provisions of this subpart and for the application of damaged stability requirements contained in § 74.10–15 of this subchapter.

§ 73.10–60 Allowances for local subdivision.

(a) Where a main transverse watertight compartment contains local subdivision, and it can be shown to the satisfaction of the Commandant that, after any assumed side damage extending over a length equal to the minimum spacing of bulkheads set forth in § 73.10–55, the whole volume of the main compartment will not be flooded, a proportionate allowance may be made in the permissible length otherwise required for such compartment. In such a case the volume of effective buoyancy assumed on the undamaged side shall not be greater than that assumed on the damaged side.

§ 73.10–65 Special standards of subdivision for certain vessels on short international voyages.

(a) Special standards of subdivision apply to certain vessels on short international voyages, which are permitted under § 75.10–10 of this subchapter to carry a number of persons on board in excess of the lifeboat capacity provided. Such vessels shall be subject to the provisions of § 73.10–5 (a), (b), (d), and (e) and §§ 73.10–10 through 73.10–60, inclusive.

(b) Such vessels shall additionally comply with the following provisions:

(1) *Permeability.* (i) The uniform average permeability throughout the portion of the ship before (or abaft) the machinery space shall be determined from the formula:

$$95-35\frac{b}{v} \qquad (1)$$

where:

b = volume of the spaces below the margin line and above the tops of floors, inner bottoms, or peak tanks, as the case may be, which are appropriated to and used as cargo spaces, coal or oil fuel bunkers, storerooms, baggage and mailrooms, chain lockers and fresh water tanks, before (or abaft) the machinery space.

v = whole volume of the portion of the ship below the margin line before (or abaft) the machinery space.

(ii) In the case of ships engaged on services where the cargo holds are not generally occupied by any substantial quantities of cargo, no part of the cargo space is to be included in calculating "b".

(2) *Required factor of subdivision.* (i) Subject to the conditions stated in this subparagraph, the subdivision shall be governed by a factor of .50 unless the factor determined by § 73.10–20 is less than .50. In such case the lesser value shall be used.

(ii) In the case of ships less than 300 feet in length, the Commandant, if satisfied that compliance with a factor of .5 or less would be impracticable in a compartment, may allow the length of such compartment to be governed by a higher factor: *Provided,* That the factor used is the lowest that is practicable and reasonable in the circumstances.

(iii) In the case of ships less than 180 feet in length, the Commandant, where considered necessary for practicability, may permit a further relaxation in the standard of subdivision subject to the requirement that the subdivision shall in no case be less than that provided by § 73.15–5.

Subpart 73.15—Rules for Subdivision—Vessels in Services Other Than Ocean or Coastwise and Vessels Under 150 Gross Tons in Ocean or Coastwise Service and Not on an International Voyage

§ 73.15–1 Permeability.

(a) In making subdivision calculations, volumes shall be calculated to the margin line, and the permeability of spaces shall be taken as follows:

(1) Machinery spaces at 85 percent.

(2) Tanks, chain lockers, and spaces normally filled with cargo, stores, mail, or baggage in the full load condition at 60 percent.

(3) All other spaces at 95 percent.

§ 73.15–5 Compartmentation of all vessels other than ferry vessels.

(a) Every mechanically propelled vessel whether or not specifically required by this section to meet at least a one-compartment standard of subdivision shall be fitted as follows:

(1) With not less than three transverse watertight bulkheads, or

(2) If in Great Lakes or limited coastwise service not more than 15 miles from the mouth of bays or harbors, with a collision bulkhead and with sufficient air tankage or other internal buoyancy to float the vessel when completely flooded, or

(3) If in lakes, bays and sounds or river service, with sufficient air tankage or other internal buoyancy to float the vessel when completely flooded.

(4) The use of internal buoyancy shall not permit omission of bulkheads required by other parts of the regulations in this chapter dealing with machinery installations, etc.

(b) Every mechanically propelled vessel of more than 75 gross tons, or carrying more than 49 passengers shall be subdivided so as not to submerge the margin line with any one main compartment flooded.

(c) Every vessel carrying more than 400 passengers shall, in addition to the requirements of paragraph (b) of this section, be subdivided so as not to submerge the margin line with the fore peak and the adjacent main compartment both flooded.

(d) Every vessel carrying more than 600 passengers shall, in addition to the requirements of paragraph (b) of this section, be subdivided so as not to submerge the margin line with any two adjacent main compartments flooded within at least the forward 40 percent of the vessel's length from the forward perpendicular.

(e) Every vessel carrying more than 800 passengers shall, in addition to the requirements of paragraph (b) of this section, be subdivided so as not to submerge the margin line with any two adjacent main compartments flooded within at least 60 percent of the vessel's length from the forward perpendicular.

(f) Every vessel carrying more than 1,000 passengers shall be subdivided by main transverse watertight bulkheads so as not to submerge the margin line with any two adjacent main compartments flooded.

§ 73.15–10 Compartmentation of ferry vessels.

(a) Every ferry vessel 150 feet or less in waterline length shall be subdivided by main transverse watertight bulkheads so as not to submerge the margin line with any one main compartment flooded. However, if sufficient air tankage or

other internal buoyancy is provided to float the vessel when completely flooded, the bulkheads may be dispensed with unless the vessel is in Great Lakes service, in which case the peak collision bulkhead must be retained.

(b) Every ferry vessel over 150 feet in waterline length shall, in addition to one-compartment subdivision, be subdivided so as not to submerge the margin line with either of the peak compartments and its adjacent main compartment both flooded.

(c) Every ferry vessel over 200 feet in waterline length shall be subdivided by main transverse watertight bulkheads so as not to submerge the margin line with any two adjacent main compartments flooded.

§ 73.15–15 Minimum spacing of bulkheads.

(a) To be considered effective, watertight bulkheads abaft the collision bulkhead shall be spaced not less than 10 feet plus 3 percent of the load waterline length. For ferry vessels, this minimum spacing shall be applicable between peak bulkheads.

§ 73.15–20 Stepped bulkheads.

(a) Watertight bulkheads shall not be stepped unless additional subdivision is provided in way of the step to maintain the same measure of safety as that secured by a plane bulkhead. Where a vessel can withstand flooding of the two adjacent compartments separated by a stepped bulkhead and no part of such bulkhead is nearer to either of the other bulkheads bounding the adjacent compartments than is permitted by § 73.15–15, the step will be acceptable.

§ 73.15–25 Recessed bulkheads.

(a) If watertight bulkheads are recessed, the recess shall be inboard from the vessel's side by at least one-fifth the beam amidship measured at right angles to the centerline at the level of the load waterline, otherwise, the bulkhead shall meet the requirements for a stepped bulkhead.

(b) For vessels in other than ocean or coastwise service, where the maximum molded beam at the deck and at the load waterline differ appreciably, the inboard damage penetration may be assumed at a mean position between that corresponding to one-fifth the maximum molded beam at the deck measured inboard at the deck and that corresponding to one-fifth the maximum molded beam at the load waterline measured inboard at the load waterline.

§ 73.15–30 Equivalent plane bulkheads.

(a) Where a main transverse bulkhead is recessed or stepped, an equivalent plane bulkhead shall be used in determining the subdivision.

Subpart 73.20—Peak and Machinery Space Bulkheads, Shaft Tunnels

§ 73.20–1 Collision bulkhead.

(a) Every vessel except as noted herein shall have a fore peak or collision bulkhead, which shall be watertight up to the bulkhead deck. This bulkhead shall be fitted not less than 5 percent of the length of the vessel (5 feet minimum for steam vessels), and not more than 10 feet plus 5 percent of the length of the vessel from the forward perpendicular. For ferry vessels, this is applicable to both peak bulkheads. However, for ferry and other vessels in lakes, bays, and sounds or river service, where internal buoyancy is permitted in lieu of bulkheads, collision bulkheads are not required.

(b) If a vessel in ocean or coastwise service has a long forward superstructure, the fore peak bulkhead shall be extended weathertight to the deck next above the bulkhead deck. The extension need not be fitted directly over the bulkhead below, provided it is at least 5 percent of the length of the vessel from the forward perpendicular and the part of the bulkhead deck which forms the step is made effectively weathertight.

(c) Notwithstanding any other provisions regarding permissible location of openings in bulkheads, watertight doors, portable plates, and similar openings will not be permitted in the collision bulkhead. This will not apply to doors fitted in weathertight bulkheads above the bulkhead deck.

§ 73.20–5 Machinery space bulkheads.

(a) In vessels other than vessels where internal buoyancy is provided to replace subdivision bulkheads, the machinery space as defined in § 73.05–10 shall be divided from the cargo and passenger spaces forward and aft by bulkheads that are fitted watertight up to the bulkhead deck.

§ 73.20–10 After peak bulkhead.

(a) On vessels over 150 gross tons, and all vessels on an international voyage regardless of tonnage, an after peak bulkhead shall be fitted and made watertight up to the bulkhead deck. However, this bulkhead may be stopped below the bulkhead deck provided the degree of safety of the vessel as regards subdivision is not thereby diminished.

§ 73.20–15 Shaft tunnels.

(a) On all vessels over 150 gross tons in ocean, coastwise, or Great Lakes service, and all vessels on an international voyage regardless of tonnage, stern tubes shall be enclosed in watertight spaces of moderate volume. The stern gland shall be situated in a watertight shaft tunnel or other watertight space separate from the stern tube compartment and of such volume that, if flooded by leakage through the stern gland, the margin line will not be submerged.

Subpart 73.25—Double Bottoms

§ 73.25–1 Application.

(a) The provisions of this subpart shall be applicable to all vessels on international voyages and in ocean, coastwise, or Great Lakes service.

§ 73.25–5 Extent of double bottoms.

(a) A double bottom should be fitted extending from the fore peak bulkhead to the after peak bulkhead as far as is practicable and compatible with the design and proper working of the vessel.

(b) In vessels 165 feet and under 200 feet in length a double bottom shall be fitted at least from the machinery space to the forepeak bulkhead, or as near thereto as practicable.

(c) In vessels 200 feet and under 249 feet in length a double bottom shall be fitted at least outside the machinery space, and shall extend to the fore and afterpeak bulkheads, or as near thereto as practicable.

(d) In vessels 249 feet in length and upwards a double bottom shall be fitted amidships and shall extend to the fore and afterpeak bulkheads or as near thereto as practicable.

(e) Where a double bottom is required to be fitted its depth shall be sufficient to provide acceptable protection against grounding. A depth in inches at the centerline of $18+\frac{L}{20}$, where L is the vessel's length in feet will ordinarily be considered acceptable. The inner bottom shall be continued out to the ship's side in such a manner as to protect the bottom to the turn of the bilge. Such protection will be deemed satisfactory if the line of intersection of the outer edge of the margin plate with the bilge plating is not lower at any part than a horizontal plane passing through the point of intersection with the frame line amidships of a transverse diagonal line inclined at 25 degrees to the base line and cutting it at a point one-half the ship's molded breadth from the middle line.

(f) A double bottom need not be fitted in way of watertight compartments of moderate size used exclusively for the carriage of liquids, provided the safety of the ship, in the event of bottom or side damage, is not, in the opinion of the Commandant, thereby impaired.

(g) In the case of vessels to which the provisions of § 73.10–65 apply and which are engaged in regular service within the limits of a short international voyage as defined in § 70.10–43 of this subchapter, the Commandant may permit a double bottom to be dispensed with in any part of the vessel which is subdivided by a factor not exceeding .50, if satisfied that the fitting of a double bottom in that part would not be compatible with the design and proper working of the vessel.

§ 73.25–10 Wells in double bottoms.

(a) Small wells constructed in the double bottom in connection with drainage arrangements of holds, etc., shall not extend downward more than necessary. The depth of the well shall in no case be more than the depth less 18 inches of the double bottom at the center line, nor shall the well extend below the horizontal plane referred to in § 73.25–5 (e). A well extending to the outer bottom is, however, permitted at the after end of the shaft tunnel of screw vessels. Other wells, such as for lubricating oil under main engines, may be permitted by the Commandant, if satisfied that the arrangements give protection equivalent

to that afforded by a double bottom complying with this section.

§ 73.25–15 Manholes in double bottoms.

(a) The number of manholes in the inner bottom shall be reduced to the minimum compatible with the design and necessity for access to the double bottom. Efficient covers, capable of being made thoroughly watertight and effectively protected from damage by cargo, or coal, shall be fitted to the manholes.

§ 73.25–20 Watertight floors in double bottoms.

(a) Watertight transverse divisions should be fitted in the double bottom under each main watertight subdivision bulkhead or as near thereto as practicable. Where duct keels are fitted, the transverse divisions need not extend across the duct keel.

Subpart 73.30—Penetrations and Openings in Watertight Bulkheads

§ 73.30–1 General.

(a) The number of openings in watertight bulkheads shall be reduced to the minimum compatible with the design and proper working of the vessel; satisfactory means shall be provided for closing these openings. Lead or other heat sensitive materials shall not be used in systems which penetrate watertight subdivision bulkheads, where deterioration of such systems in the event of fire would impair the watertight integrity of the bulkheads.

§ 73.30–5 Pipes, cables, etc.

(a) Where pipes, scuppers, electric-light cables, etc., are carried through watertight subdivision bulkheads, arrangements shall be made to insure the integrity of the watertightness of the bulkheads.

§ 73.30–10 Valves and cocks.

(a) Valves and cocks not forming part of a piping system shall not be permitted in watertight subdivision bulkheads.

§ 73.30–15 Prohibited locations for access openings.

(a) No doors, manholes, or access openings are permitted in the following locations:

(1) Collision bulkhead below the margin line.

(2) Watertight transverse bulkheads dividing a cargo space from an adjoining cargo space or from a permanent or reserve bunker.

§ 73.30–20 Pipes through collision bulkhead.

(a) For details of piping through collision bulkheads, see Subchapter F (Marine Engineering) of this chapter.

§ 73.30–25 Watertight door limitations.

(a) *General.* (1) Watertight door openings shall be located as high in the bulkhead and as far inboard as practicable. The number of watertight doors shall be reduced to the minimum consistent with the design and proper working of the vessel.

(b) *Machinery space doors.* (1) Within spaces containing the main and auxiliary propelling machinery including boilers serving the needs of propulsion and all permanent bunkers, not more than one door apart from the doors to bunkers and shaft tunnels may be fitted in each main transverse bulkhead. Where two or more shafts are fitted, the tunnels shall be connected by an intercommunicating passage. There shall be only one door between the machinery space and the tunnel spaces where not more than two shafts are fitted and only two doors where there are more than two shafts. Except as provided in § 73.35–5(b), all these doors shall be of the sliding type and shall be located so as to have their sills as high as practicable. The hand gear for operating these doors from above the bulkhead deck shall be situated outside the spaces containing the machinery if this is consistent with a satisfactory arrangement of the necessary gearing.

(c) *Bunker doors.* (1) Watertight doors fitted in bulkheads between permanent and reserve bunkers shall be always accessible except as provided in § 73.35–15 (b) for between deck bunker doors. Satisfactory arrangements shall be made by means of screens or otherwise, to prevent the coal from interfering with the closing of watertight bunker doors.

§ 73.30–30 Trunkways or tunnels.

(a) Where trunkways or tunnels for access from crew's accommodations to the stokehold, for piping, or for any other purpose are carried through main transverse watertight bulkheads, they shall be watertight and in accordance with structural requirements for watertight bulkheads. The access to at least one end of each such tunnel or trunkway, if used as a passage at sea, shall be through a trunk extending watertight to a height sufficient to permit access above the margin line. The access to the other end of the trunkway or tunnel may be through a watertight door of the type required by its location in the ship. Such trunkways or tunnels shall not extend through the first subdivision bulkhead abaft the collision bulkhead.

(b) A short tunnel extending through not more than one main subdivision compartment and which is closed at one end need not be fitted with a door at the other end, provided its sides are not nearer to the shell than is permitted for the sides of a recess in a bulkhead as stated in § 73.15–25 and the volume of the tunnel, if included with the volume of the compartment to which it opens, does not result in the equivalent length of such compartment being in excess of the permissible length.

(c) Where it is proposed to fit tunnels or trunkways for forced draft, piercing main transverse watertight bulkheads, these shall receive the special consideration of the Commandant.

§ 73.30–35 Portable plates.

(a) Openings closed only by portable bolted plates are not permitted in watertight subdivision bulkheads except in machinery spaces. Such plates shall always be in place and made watertight before the vessel leaves port and shall not be removed at sea except in case of urgent necessity.

§ 73.30–40 Openings above margin line.

(a) Where a portion of an assumed margin line is appreciably below the deck to which bulkheads are carried, and it can be shown that the maintenance of complete watertightness will result in undue hardship in the arrangement of the vessel, a limited amount of nontight bulkhead penetrations may be permitted as high as possible immediately under the bulkhead deck. Such penetrations shall be subject to specific approval in each instance and will generally be limited as follows:

(1) Not more than 2 feet below the molded line of the bulkhead deck.

(2) Not less than 9 inches above the margin line.

(3) Not outboard of vertical lines located off the centerline at a distance of ¼ the full breadth of the ship measured on the bulkhead deck at the point in question.

(b) Approved nontight bulkhead penetrations shall be indicated on a suitable plan carried aboard the vessel.

Subpart 73.35—Watertight Bulkhead Doors

§ 73.35–1 Types and classes.

(a) The only types of watertight doors permissible are hinged doors, sliding doors, and doors of other equivalent patterns, excluding plate doors secured only by bolts and doors required to be closed by dropping or by the action of a dropping weight. Sliding doors may have horizontal or vertical motion. The permissible classes of doors are:

Class 1—Hinged doors.
Class 2—Sliding doors, operated by hand gear only.
Class 3—Sliding doors, operated by power and by hand gear.

(b) Where a door of a particular class is specified, a door of a class bearing a lower number may not be fitted, but a door of a class bearing a higher number may be fitted unless otherwise noted.

§ 73.35–5 Class 1 doors, permissible locations.

(a) Class 1 doors within passenger, crew, and working spaces are only permitted above a deck, the molded line of which, at its lowest point at side, is at least 7 feet above the deepest subdivision load line, and they are not permitted in such spaces below such a deck except as permitted in paragraph (b) of this section.

(b) On vessels under 150 gross tons in coastwise or Great Lakes service not proceeding more than 20 miles from shore and on all vessels on other inland waters, Class 1 doors may be permitted within any accommodation and working spaces provided it is practical to keep such doors closed at all times except when actually being used for transit.

§ 73.35–10 Class 2 doors, permissible locations.

(a) Watertight doors, the sills of which are above the deepest loadline and below the line specified in § 73.35–5(a) shall be sliding doors and may be hand operated (Class 2), except as provided in § 73.35–15(d).

(b) When the number of watertight doors which may be sometimes opened at sea, and whose sills are below the deepest subdivision loadline (excluding doors at entrance to shaft tunnels) does not exceed five and the ship has no passenger spaces below the bulkhead deck, these watertight doors and the shaft tunnel doors shall be of sliding type but may be hand operated (Class 2).

(c) When the total number of watertight doors which may be sometimes opened at sea, and whose sills are below the deepest subdivision loadline, does not exceed two and they are into or within the space containing machinery, these two doors shall be of sliding type but may be hand operated (Class 2).

§ 73.35–15 Class 3 doors, required locations.

(a) When the number of watertight doors which may be sometimes opened at sea, and whose sills are below the deepest subdivision loadline (excluding doors at entrance to shaft tunnels) exceeds five, or where the vessel has passenger spaces below the bulkhead deck, all of these doors and those at the entrance to shaft tunnels or ventilation or forced draft ducts shall be power operated (Class 3), and shall be capable of being simultaneously closed from a central station situated on the bridge.

(b) If watertight doors are fitted between bunkers in the 'tween decks below the bulkhead deck and have to be opened at sea for the purpose of trimming coal, these doors shall be of Class 3.

(c) When trunkways, in connection with refrigerated cargo, are carried through more than one main transverse watertight bulkhead and the sills of the trunkway doors are less than 7 feet above the deepest subdivision load line, these doors shall be of Class 3.

(d) In the case of vessels engaged on short international voyages, subject to the provisions of § 73.10–65, and required to have a factor of subdivision of .50 or less, all watertight doors below a deck, the molded line of which, at its lowest point at side, is at least 7 feet above the deepest subdivision loadline shall be power-operated (Class 3).

§ 73.35–17 Cargo space doors.

(a) Where it is proposed to fit doors between cargo tween deck spaces the number and arrangement will be subject to special consideration. Where the Commandant is satisfied that such doors are essential, watertight doors of satisfactory construction may be fitted in bulkheads dividing cargo between-deck spaces. Such doors may be hinged, rolling or sliding doors but shall not be remotely controlled. They shall be fitted at the highest level and as far from the shell plating as practicable but in no case shall the outboard vertical edges be situated at a distance from the shell plating which is less than one-fifth of the breadth of the ship, as defined in § 73.05–4, such distance being measured at right angles to the centerline of the vessel at the level of the deepest subdivision loadline.

(b) Such doors shall be closed before the voyage commences and shall be kept closed during navigation; and the time of opening such doors in port and of closing them before the vessel leaves port shall be entered in the log book. Should any of the doors be accessible during the voyage, they shall be fitted with a device which prevents unauthorized opening.

§ 73.35–20 Door operating requirements.

(a) Hinged watertight doors (Class 1) shall be fitted with quick action closing devices, such as catches workable from either side of the bulkhead so spaced that the door can be made effectively watertight. In the case of a door which is required to be closed before the voyage commences and kept closed all during the voyage, the catches may be fitted to operate from one side only, provided it be shown that under all operating conditions the door shall be always closed from the one side.

(b) Both Class 2 and Class 3 sliding watertight doors shall be provided with hand operating gear, capable of being operated from positions on each side of the door itself and also of closing (but not opening) the door from an accessible position above the bulkhead deck. Hand operating gear shall have an all around crank motion, or some other movement, approved by the Commandant as providing equivalent safety. The time for closing a Class 2 door, with the vessel upright, shall not exceed 90 seconds.

(c) Class 3 sliding watertight doors:

(1) Class 3 sliding watertight doors which are required to be operated from a central control on the bridge shall also be operated by power at the door itself from both sides. The arrangement shall be such that the door will close automatically if opened by local control after being closed from the central control, and also such that any door can be kept closed by local arrangements which will prevent that door from being opened from the central control. Local power control handles shall be provided on each side of the bulkhead and shall be so arranged as to enable persons passing through the doorway to hold both handles in the open position without being able to set the closing mechanism in operation accidentally. The door shall take sufficient time to close to ensure safety.

(2) There shall be at least two independent power sources capable of opening and closing all the doors under control, each of them capable of operating all the doors simultaneously. Operations will be regarded as simultaneous if all doors can be closed in not more than 60 seconds after actuation of a single master control. The power source shall have indicating lights at the central control station to indicate which power source is available for use. The power supply sources for the operation of electric power-operated watertight doors shall meet the requirements of § 111.65–30(c) in Subchapter J (Electrical Engineering) of this chapter. In the case of hydraulic operation, each power source shall consist of a pump capable of closing all doors within the foregoing time limit. In addition, there shall be, for the whole installation, hydraulic accumulators of sufficient capacity to operate all the doors at least three times, i.e., closed-open-closed. In the case of combination electric hydraulic systems utilizing individual electrically-driven hydraulic actuators on each door, a duplication of these actuators and drives is not required. The fluid used in hydraulic systems shall be one which retains adequate operational fluidity at any temperature liable to be encountered by the vessel during its service.

(3) The requirement for operation of Class 3 doors from the central control station on the bridge refers to closing of the doors. Remote opening is not required but, if provided, shall comply with the applicable provision of subparagraph (1) of this paragraph.

(d) The means of operation of any watertight door whether power-operated or not shall be capable of closing the door with the ship listed to 15 degrees either way.

§ 73.35–25 Door indicators and warning signals.

(a) In all classes of watertight doors, indicators shall be fitted, which show, at all operating stations from which the doors are not visible, whether the doors are opened or closed. If any of the watertight doors, of whatever class, is not fitted so as to enable it to be closed from a central control station, it shall be provided with a mechanical, electrical, telephonic, or any other suitable direct means of communication, enabling the officer of the watch promptly to contact the person who is responsible for closing the door in question, under previous orders. Watertight doors and controls shall be marked as provided by § 78.47–37 of this subchapter.

(b) For Class 3 watertight doors, provision shall be made to give warning signal by electric horn or howler when the door is about to be closed; the signal shall precede the movement of the door by a safe interval and shall continue until the door is completely closed.

§ 73.35–30 Doors, design, installation, and tests.

(a) The design of all watertight doors shall be subject to approval by the Commandant.

(b) Each Class 1 door installed on a vessel in ocean or coastwise service shall be tested by water pressure to a head up to the margin line, but in no case less than 10 feet. Such doors on vessels in other services shall be tested in the same manner as the bulkhead in which they are fitted.

(c) Each Class 2 and Class 3 door shall be designed, tested, and installed in accordance with Subpart 163.001 of Sub-

chapter Q (Specifications) of this chapter.

Subpart 73.40—Openings in Vessel's Sides Below the Bulkhead Deck

§ 73.40–1 General.

(a) The requirements of this section apply to all openings in the sides of vessels below the bulkhead deck whether or not such openings give direct access to spaces above or below the bulkhead deck, except as otherwise specified in this subchapter.

(b) In the case of a vessel not having a continuous bulkhead deck it is necessary that special consideration should be given to the application of this section, particularly with regard to openings through the sides of the vessel in way of or leading from spaces below the highest of the trim lines used in the development of the floodable length curves.

(c) The number of openings in vessel's sides below the bulkhead deck shall be reduced to the minimum compatible with the proper design and working of the vessel.

(d) The arrangement and efficiency of the means for closing each opening shall be consistent with its intended purpose and the position in which it is fitted, and shall be to the satisfaction of the Commandant.

§ 73.40–5 Port lights.

(a) Port lights on vessels under 150 gross tons in ocean or coastwise service, and on all vessels in Great Lakes, lakes, bays, and sounds, or river service as follows:

(1) No port lights are permitted in the vessel's side below the bulkhead deck.

(b) Port lights on vessels of 150 gross tons and over in ocean or coastwise service as follows:

(1) If, in a 'tween deck, the sills of any port lights are below a line drawn parallel to the molded line of the bulkhead deck at side and having its lowest point 2½ percent of the breadth of the vessel above the deepest subdivision load line, all port lights in that 'tween deck shall be of a nonopening type.

(2) All port lights, the sills of which are below the bulkhead deck, other than those required to be of a nonopening type shall be of such construction as will effectively prevent any person opening them without the consent of the master of the vessel.

(3) No port lights shall be fitted in spaces which are appropriated exclusively to the carriage of cargo, stores, or coal.

(4) Port lights may be fitted in spaces appropriated alternately to the carriage of cargo or passengers and they shall be of the type required by their location in the vessel, provided dead covers are always fitted when cargo is carried.

(5) Design of port lights below the bulkhead deck as follows:

(i) All port lights are to be of substantial construction subject to approval of the Commandant.

(ii) Nonopening port lights are to be thoroughly watertight and port lights which are capable of being opened shall be so constructed that they can be easily and effectively closed and secured watertight. Port lights capable of being opened shall have fitted to one or more of the bolts a special round slotted or recessed nut requiring a special wrench. The special nuts are to be protected by sleeves or guards so as to render them incapable of being released by the use of ordinary tools, such as pipe wrenches, etc.

(c) *Dead covers.* (1) Hinged inside dead covers shall be fitted to all port lights below the margin line except that dead covers may be portable in passenger accommodations other than for steerage passengers provided they are stowed adjacent to their respective port lights and that all the following conditions are complied with.

(i) Such port lights are above the deck to which the minimum freeboard for the vessel can be obtained.

(ii) Such port lights are abaft one-eighth of the vessel's length from the forward perpendicular.

(iii) Such port lights are above a line drawn parallel to the bulkhead deck at side and having its lowest points at a height of 12 feet plus 2½ percent of the breadth of the vessel above the deepest subdivision load line.

(2) Dead covers shall be of efficient design and arranged so that they can be easily and effectively secured watertight. Where fitted to opening-type port lights, they shall be of such design that it will not be necessary to release the special or locked nut in order to secure the dead cover.

§ 73.40–10 Automatic ventilators.

(a) Automatic ventilators shall not be fitted in vessel's sides below the bulkhead deck without the special sanction of the Commandant.

§ 73.40–15 Side ports.

(a) Gangway, cargo, and coaling ports, and similar openings in the vessel's sides shall be designed and constructed to the approval of the Commandant. Such ports or openings shall be in no case fitted so as to have their lowest point below the deepest subdivision load line.

§ 73.40–20 Piping openings in vessel's sides.

(a) Requirements for inlets and discharges of scuppers, sanitary piping, main and auxiliary machinery piping, and ash and rubbish-chutes, etc., are in § 55.10–70 of Subchapter F (Marine Engineering) of this chapter.

Subpart 73.45—Watertight Integrity Above the Margin Line

§ 73.45–1 General.

(a) All reasonable and practicable measures shall be taken to limit the entry and spread of water above the bulkhead deck. Such measures may include partial bulkheads or webs.

(b) When partial watertight bulkheads and webs are fitted on the bulkhead deck, above or in the immediate vicinity of main subdivision bulkheads, they shall have watertight shell and bulkhead deck connections so as to restrict the flow of water along the deck when the vessel is in a heeled-damaged condition. Where the partial watertight bulkhead does not line up with the bulkhead below, the bulkhead deck between shall be made effectively watertight.

§ 73.45–5 Decks.

(a) The bulkhead deck or a deck above it shall be weathertight in the sense that in ordinary sea conditions water will not penetrate in a downward direction.

(b) All openings in the exposed weather deck shall have coamings of ample height and strength and shall be provided with efficient means for expeditiously closing them weathertight.

(c) Freeing ports, open rails and/or scuppers shall be fitted as necessary for rapidly clearing the weather deck of water under all weather conditions.

§ 73.45–10 Side openings.

(a) All side openings in the vessel's shell above the bulkhead deck and all deck openings in or above the bulkhead deck shall comply with the applicable requirements of Subchapters E (Load Lines) and F (Marine Engineering) of this chapter for type closures and fittings. Port lights, gangway, cargo and coaling ports and other means for closing openings in the shell plating above the margin line shall be of efficient design and construction and of sufficient strength having regard to the spaces in which they are fitted and their positions relative to the deepest subdivision loadline.

(b) Efficient inside dead covers, arranged so that they can be easily and effectively closed and secured watertight, shall be provided for all port lights to spaces below the first deck above the bulkhead deck.

Subpart 73.90—Vessels Contracted for Prior to May 26, 1965

§ 73.90–1 Requirements.

(a) Vessels contracted for prior to May 26, 1965, shall meet the following requirements:

(1) Existing arangements, materials, and facilities previously approved will be considered satisfactory so long as they meet the minimum requirements of this section, and they are maintained in good condition to the satisfaction of the Officer in Charge, Marine Inspection. Minor repairs and alterations may be made to the same standards as the original installation.

(2) The details and arrangements shall be in general agreement with the applicable provisions of Subparts 73.05 through 73.45 insofar as is reasonable and practicable.

PART 74—STABILITY

Subpart 74.01—Application

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Subpart 74.90—Vessels Contracted for Prior to May 26, 1965

74.90-1 Requirements.

AUTHORITY: The provisions of this Part 74 issued under R.S. 4405, as amended, 4462, as amended; 46 U.S.C. 375, 416. Interpret or apply R.S. 4417, as amended, 4418, as amended, 4426, as amended, 4488, as amended, 4490, as amended, sec. 3, 24 Stat. 129, as amended, sec. 10, 35 Stat. 428, as amended, 41 Stat. 305, as amended, sec. 2, 45 Stat. 1493, as amended, sec. 2, 49 Stat. 888, as amended, sec. 5, 49 Stat. 1384, as amended, secs. 1, 2, 49 Stat. 1544, 1545, as amended, sec. 3, 54 Stat. 347, as amended, sec. 3, 70 Stat. 152, sec. 3, 68 Stat. 675; 46 U.S.C. 391, 392, 404, 481, 482, 483, 395, 363, 85a, 88a, 369, 367, 1333, 390b, 50 U.S.C. 198; E.O. 11239, July 31, 1965, 30 F.R. 9671, 3 CFR, 1965 Supp. Treasury Department Orders 120, July 31, 1950, 15 F.R. 6521; 167-14, Nov. 26, 1954, 19 F.R. 8026; 167-20, June 18, 1956, 21 F.R. 4894; CGFR 56-28, July 24, 1956, 21 F.R. 5659; 167-38, Oct. 26, 1959, 24 F.R. 8857; 167-48, Oct. 19, 1962, 27 F.R. 10504.

Subpart 74.01—Application

§ 74.01-1 General.

(a) The provisions of this part shall apply to the following vessels:

(1) All vessels on an international voyage.

(2) All vessels carrying more than 49 passengers or of more than 100 gross tons.

(3) All ferry vessels.

(4) Any other vessel whose stability is questioned by the Officer in Charge, Marine Inspection, including any vessel subject to the act of May 10, 1956 (46 U. S. C. 390-390g).

(b) The provisions of this part, with the exception of Subpart 74.90, shall apply to all the vessels noted in paragraph (a) of this section, which are contracted for on or after May 26, 1965. Such vessels contracted for prior to May 26, 1965, shall meet the requirements of Subpart 74.90.

Subpart 74.05—Stability Test

§ 74.05-1 When required.

(a) Except as otherwise provided in this section, each vessel to which this part applies, shall be subjected to a stability test conducted under the supervision of the Coast Guard and the results of the test shall be approved before the vessel is placed in service. Whenever alterations to a vessel are sufficiently extensive to make use of the data obtained from the original stability test questionable in the circumstances, it shall be re-inclined.

(b) The Commandant may allow the stability test of a vessel to be dispensed with provided basic stability data are available from the stability test of a sister vessel and it is shown to the satisfaction of the Commandant that reliable stability information for the exempted vessel can be obtained from such basic data.

(c) Except for vessels on an international voyage, the Commandant may allow the stability test of a vessel to be dispensed with in exceptional cases where it can be shown to his satisfaction that due to the form, construction, and arrangement of the vessel stability calculations can be safely made without a stability test being performed.

§ 74.05-5 Procedure.

(a) Stability tests shall meet the requirements of this section.

(b) Plans required: (1) The following plans are essential for use in conducting the stability test and determining the results, and if these plans have not been previously submitted, they shall be made available at the time of the test:

Lines plan.
Curves of form or hydrostatic curves.
General arrangement plans of decks, holds, inner bottoms, etc.
Outboard profile.
Inboard profile.
Midship section.
Capacity plan showing capacities and vertical and longitudinal centers of gravity of cargo spaces, tanks, etc.
Tank sounding tables.
Draft mark locations.

(c) Stability test preparations: (1) Preparations as noted in this paragraph shall be made to place a vessel in suitable condition for a stability test. The Coast Guard representative supervising the stability test may relax from these standards in a particular instance if, in his opinion, such relaxation is warranted and will not materially affect the reliability of the results of the test.

(2) To obtain dependable stability results, all tanks on the vessel, as far as practicable, shall be either completely empty and dry or fully pressed up and without air pockets. Where this is impracticable, slack tanks may be accepted provided their free surface can be readily and accurately determined for the angles of heel to be obtained during the stability test.

(3) The vessel shall be as nearly complete as practicable when the test is conducted. If additional material or equipment is to be installed after the test, a complete list of such items by weight and location shall be prepared.

(4) All dunnage, tools, and other items extraneous to the completed vessel shall be removed before the test.

(5) The vessel shall be moored in a location reasonably protected from broadside wind, waves and tide. The depth of water shall be sufficient to provide ample clearance under the vessel against grounding. Mooring lines shall be arranged so that they will not interfere with the free rolling or listing of the vessel.

Subpart 74.10—Stability Standards

§ 74.10-1 General.

(a) With the vessel in the intact condition, the net metacentric height at any operating draft, including allowance for normally slack tanks, shall not be less than the standards outlined in this subpart, taken singly, and the most severe requirement shall govern at any particular draft.

§ 74.10-5 Weather criteria.

(a) The required minimum metacentric height (GM) in feet at any particular draft is obtained from the following formula:

$$GM=\frac{PAh}{\Delta \tan \theta} \qquad (1)$$

where:

$P=.005+\left(\frac{L}{14{,}200}\right)^2$ tons/ft² for ocean and coastwise service.

$P=.0033+\left(\frac{L}{14{,}200}\right)^2$ tons/ft² for partially protected waters such as lakes, bays, and sounds, and Great Lakes (summer service).

$P=.0025+\left(\frac{L}{14{,}200}\right)^2$ tons/ft² for protected waters such as rivers, harbors, etc.

L = Length between perpendiculars in feet.

A = Projected lateral area in square feet of portion of vessel above waterline.

h = Vertical distance in feet from center of A to center of underwater lateral area or approximately one-half draft point.

Δ = Displacement in long tons.

θ = Angle of heel to one-half the freeboard to the deck edge or 14 degrees whichever is less. (For vessels having a discontinuous weather deck or abnormal sheer, the angle to one-half the freeboard may be suitably modified.)

§ 74.10-10 Passenger criteria.

(a) The required minimum metacentric height (GM) in feet is obtained from the following formula:

$$GM=\frac{N\times b}{24\Delta \tan \theta} \qquad (1)$$

where:

N = Number of passengers.

b = Distance in feet from the vessel's centerline to the geometrical center of the passenger deck area on one side of centerline.

Δ = Displacement in long tons.

θ = Angle of heel to deck edge or 14 degrees, whichever is less.

§ 74.10–11 Special cases.

(a) The criteria of §§ 74.10–5 and 74.10–10 are generally limited in application to flush deck powered vessels of ordinary proportions and form. In the case of vessels not considered to come within this category, the Commandant may require or accept a modification of these criteria or such additional calculations as may be necessary to demonstrate the limits of safe operation.

§ 74.10–15 Damaged stability standards.

(a) *Application.* (1) The provisions of this section shall apply to all vessels that are required by Subparts 73.10 and 73.15 of this subchapter to have at least a one-compartment standard of subdivision.

(b) *General requirements.* (1) Sufficient intact stability shall be provided in all service conditions so as to enable the vessel to withstand flooding at any place throughout its length due to the assumed side damage as outlined in paragraph (c)(4) of this section.

(2) Where two adjacent main subdivision compartments are separated by a bulkhead which is stepped under the conditions of § 73.10–40 or 73.15–20, the intact stability shall be adequate to withstand the flooding assumed under § 73.10–40 or 73.15–20 of this subchapter, as applicable.

(c) *Damaged stability calculations.* (1) The requirements of paragraph (b) of this section shall be determined by calculations which take into consideration the proportions and design characteristics of the vessel and the arrangement and configuration of the damaged compartments. Where decks, inner skins, or longitudinal bulkheads are to be fitted of sufficient tightness to seriously restrict the flow of water, the Commandant shall be satisfied that proper consideration is given to such restrictions in the calculations. Where it is considered that the range of stability in the damaged condition is doubtful, the Commandant will require the investigation thereof.

(2) In making these calculations the vessel is to be assumed in the worst anticipated service condition as regards stability.

(3) For damaged stability calculations the volume and surface permeabilities shall be in general as indicated in Table 74.10–15(c)(3). Higher surface permeabilities are to be assumed in respect of spaces which, in the vicinity of the damage waterplane, contain no substantial quantity of accommodation or machinery and spaces which are not generally occupied by any substantial quantity of cargo or stores. The maximum surface permeability which must be assumed need not exceed 95.

TABLE 74.10–15(c)(3)

Spaces	Permeability
Appropriated to cargo, coal or stores	60
Appropriated to accommodations	95
Appropriated to machinery	85
Intended for liquids (use value resulting in more severe requirement)	0 or 95

(4) The minimum assumed extent of side damage shall be taken in accordance with Table 74.10–15(c)(4). Where any damage of a lesser extent than provided in the table would result in a more severe condition regarding heel or loss of metacentric height, such damage shall also be considered in the calculations.

TABLE 74.10–15(c)(4)

Vessel category	Longitudinal extent [1]	Transverse extent [2] [3]	Vertical extent
All vessels	10 feet+0.03L or 35 feet (whichever is less) no main bulkhead involved.	¼B	From base line upward without limit.
Vessels required by Subpart 73.15 to have a two compartment standard of subdivision.	35 feet or 10 feet+0.03L (whichever is less) involving not more than one main bulkhead.	¼B	From base line upward without limit.
Vessels required by Subpart 73.10 to have a factor of subdivision of 0.50 or less.	10 feet+0.03L or 35 feet (whichever is less) involving not more than one main bulkhead.	¼B	From base line upward without limit.
	20 feet+0.04L, involving not more than one main bulkhead.	¼B	Top of double bottom upward without limit.
Vessels required by Subpart 73.10 to have a factor of subdivision of 0.33 or less.	20 feet+0.04L, but in any case long enough to involve two main bulkheads	¼B	From base line upward without limit.

[1] L equals the length of the vessel as defined in § 73.05–3.
[2] B equals the breadth of the vessel as defined in § 73.05–4.
[3] The transverse extent of damage is measured inboard from the vessel's side and at right angles to the centerline at the level of the deepest subdivision load line. For vessels on inland waters and for ferry vessels, where the maximum molded beam at the deck and at the load water line differ appreciably, the transverse extent of damage may be taken as the mean between the inboard penetration at the deck using the maximum beam at the deck and the inboard penetration at the deepest subdivision load line using the maximum beam at that load line.

(5) Unsymmetrical flooding is to be kept to a minimum consistent with efficient arrangements. Where it is necessary to correct large angles of heel, the means adopted shall, where practicable, be self-acting, but in any case where controls to cross-flooding fittings are provided they shall be operable from above the bulkhead deck. The construction and arrangement of such fittings and of their controls, together with the estimated maximum heel before equalization, is subject to approval by the Commandant. The time for equalization to acceptable heel limits, as provided in subparagraphs (7) and (8) of this paragraph, shall in no case be more than 15 minutes. On vessels under 150 gross tons in ocean or coastwise service and on all vessels in lake, bay, and sound or river service, the equalizing arrangements, where required, shall not be dependent either upon manual or automatic operation of valves or similar appliances.

(6) For symmetrical flooding, or in the case of unsymmetrical flooding, after equalization measures have been taken, there shall be a positive residual metacentric height of at least 2 inches (calculated on the basis of the initial undamaged displacement).

(7) For unsymmetrical flooding with assumed side damage not more than 10 feet plus .03L, the remaining heel due to unsymmetrical moment, after equalization, as provided by subparagraph (5) of this paragraph, shall not exceed 7 degrees. However, where equalization is fully automatic and by open cross connections of large area, or where no equalization is involved, and in any case, the range of stability in the damaged condition is considered adequate, the Commandant may allow a greater heel up to but not in excess of 15 degrees.

(8) For unsymmetrical flooding with assumed side damage in excess of 10 feet plus 0.03*L*, the remaining heel due to unsymmetrical moment, after equalization as provided by subparagraph (5) of this paragraph shall not exceed 15 degrees.

(9) In no case shall the margin line be submerged in the final stage of flooding. If it is considered that the margin line may become submerged during an intermediate stage of flooding, the Commandant may require such investigations and arrangements as shall be considered necessary for the safety of the vessel.

(d) *Relaxation of requirements.* (1) No relaxation from the requirements for damaged stability may be considered by the Commandant unless it is shown that the intact metacentric height in any service condition necessary to meet these requirements is excessive for the service intended.

(2) Relaxations from the requirements for damaged stability shall be permitted only in exceptional cases and subject to the conditions that the Commandant is to be satisfied that the proportions, arrangements and other characteristics of the vessel are the most favorable to stability after damage which can practically and reasonably be adopted in the particular circumstances.

§ 74.10–20 Special operating conditions.

(a) Where a vessel may be operated under conditions where its stability will be affected by factors not covered by §§ 74.10–5 through 74.10–15 such factors shall be investigated to determine if the vessel has sufficient stability to meet such conditions.

Subpart 74.15—Ballast

§ 74.15–1 When required.

(a) Where it is determined that a vessel does not have sufficient stability to meet the requirements of the stability standard and the characteristics of the vessel cannot be altered to provide the required stability, ballast may be required. This ballast may be solid fixed ballast, liquid ballast, or both.

§ 74.15–5 How installed.

(a) Solid ballast, when required, shall be installed in the vessel under the supervision of the Officer in Charge, Marine Inspection. The amount of installed ballast shall be weighed or otherwise accurately determined and located in a vertical and longitudinal position to meet the stability requirements. This ballast shall be stowed in a satisfactory manner to prevent shifting of position in a seaway. Such ballast required for stability shall not be removed from the vessel or relocated unless approved by the Commandant, except that such ballast may be temporarily moved for examination or repair of the vessel, when done under the supervision of an inspector.

§ 74.15–10 Liquid ballast.

(a) When ballasting with water is necessary the water ballast should not, in general, be carried in tanks intended for oil fuel.

(b) In ships in which it is not practicable to avoid putting water ballast in oil fuel tanks, it will be required that all such ballast necessary to compliance with the stability requirements of this part be carried into port. Discharge of such ballast may then be effected either into sludge barges or shore facilities, or through oily ballast separators. In this latter case the separators shall meet the requirements prescribed in Subchapter F (Marine Engineering) of this chapter.

Subpart 74.20—Stability Instructions for Operating Personnel

§ 74.20–1 Data supplied master.

(a) The master shall be supplied with such reliable information as is necessary to enable him by rapid and simple processes to obtain accurate guidance as to the stability of the ship under varying conditions of service, so as to permit compliance with stability requirements.

(b) This information and necessary related plans and data shall be submitted to the Commandant for approval.

§ 74.20–5 Conditions under which calculations made.

(a) The master of the vessel shall be informed of the conditions under which the damaged stability calculations have been made and advised to what extent the vessels can safely withstand damage under these assumed conditions.

§ 74.20–10 Cross-flooding.

(a) In the case of a vessel requiring cross-flooding, the master shall be provided with the conditions of stability on which the calculations of heel are based and be warned that excessive heel might result should the vessel sustain damage when in a less favorable condition. Suitable information shall be supplied concerning the use of any special cross-flooding fittings.

§ 74.20–15 Type of instructions.

(a) In all ships on international voyages the information called for by this subpart shall be provided in booklet form; at least two copies, one for the master and one for the chief engineer, being supplied each ship. Included as part of these booklets, at suitably reduced scale, shall be plans showing clearly for each deck and hold the boundaries of the watertight compartments, the openings therein with the means of closure and position of any controls thereof, and the arrangements for the correction of any list due to flooding.

(b) Depending upon the extent of necessary information, such booklets may also be required for vessels not on international voyages. In any case, it will be required that any information necessary to compliance with stability and watertight integrity requirements be supplied.

(c) Whenever alterations are made to the vessel so as to materially affect the stability information, amended stability information shall be provided.

Subpart 74.25—Stability Letter

§ 74.25–1 Posting.

(a) Each vessel subject to the requirements of this part shall have posted under glass in the pilothouse a stability letter issued by U.S. Coast Guard before the vessel is placed in service operation. This letter shall indicate, either by specific instructions embodied in the letter or by reference to separate instructions available to the master, the conditions of operation under which the vessel will have satisfactory stability.

Subpart 74.90—Vessels Contracted for Prior to May 26, 1965

§ 74.90–1 Requirements.

(a) Vessels contracted for prior to May 26, 1965, shall meet the requirements specified in this section.

(b) Except as otherwise provided in this section, existing arrangements, materials, and facilities previously approved will be considered satisfactory so long as they meet the minimum requirements of this section and they are maintained in a suitable condition to the satisfaction of the Officer in Charge, Marine Inspection. Minor repairs and alterations may be made to the original standards.

(c) In general, the standards of stability previously attained should be maintained. In this regard, and particularly with respect to § 74.10–15, no change or modification should result in a lowering of stability farther below that required for a new vessel than existed before the change or modification. This is intended to include the normal additions and subtractions which occur over the life of the vessel.

PART 75—LIFESAVING EQUIPMENT

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Subpart 75.90—Ship's Distress Signals

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75.90-10 Vessels in Great Lakes service.

AUTHORITY: The provisions of this Part 75 issued under R.S. 4405, as amended, 4462, as amended; 46 U.S.C. 375, 416. Interpret or apply R.S. 4417, as amended, 4418, as amended, 4426, as amended, 4488, as amended, 4491, as amended, sec. 10, 35 Stat. 428, as amended, 41 Stat. 305, as amended, secs. 1, 2, 49 Stat. 1544, 1545, as amended, sec. 17, 54 Stat. 166, as amended, sec. 3, 54 Stat. 347, as amended, sec. 3, 70 Stat. 152, sec. 3, 68 Stat. 675; 46 U.S.C. 391, 392, 404, 481, 489, 395, 363, 367, 526p, 1333, 390b, 50 U.S.C. 198; E.O. 11239, July 31, 1965, 30 F.R. 9671, 3 CFR, 1965 Supp. Treasury Department Orders 120, July 31, 1950, 15 F.R. 6521; 167-14, Nov. 26, 1954, 19 F.R. 6521; 167-20, June 18, 1956, 21 F.R. 4894; CGFR 56-28, July 24, 1956, 21 F.R. 5659; 167-38, Oct. 26, 1959, 24 F.R. 8857.

Subpart 75.01—Application

§ 75.01-1 Details of application.

Except as specifically noted, the provisions of this part shall apply to all vessels.

Subpart 75.05—General Provisions Pertaining to Lifesaving Equipment

§ 75.05-1 Equipment of an approved type.

(a) Where equipment in this part is required to be of an approved type, such equipment requires the specific approval of the Commandant. Such approvals are published in the FEDERAL REGISTER, and in addition, are contained in Coast Guard publication CG-190, "Equipment Lists."

(b) Specifications for many of the items required to be of an approved type have been promulgated and are contained in Subchapter Q (Specifications) of this chapter. In general, such specifications are of interest only to the manufacturer of specific items of equipment.

§ 75.05-5 Equipment installed but not required.

Where items of lifesaving equipment are not required, but are installed, such equipment and its installation shall meet the requirements of this part.

§ 75.05-10 Primary lifesaving equipment.

(a) The term "primary lifesaving equipment" means a lifeboat or an acceptable substitute. Life preservers and ring life buoys are not included in this definition of "primary lifesaving equipment."

Subpart 75.10—Lifeboats, Liferafts, Lifefloats, and Buoyant Apparatus

§ 75.10-1 Application.

(a) Except as otherwise provided in this section, the provisions of this subpart shall apply to all vessels contracted for on or after May 26, 1965.

(b) Vessels contracted for prior to May 26, 1965, shall meet the requirements of § 75.10-90.

§ 75.10-5 Type of lifeboats, liferafts, lifefloats, and buoyant apparatus required.

(a) *Lifeboats.* (1) All lifeboats shall be of an approved type, constructed in accordance with Subpart 160.035 of Subchapter Q (Specifications) of this chapter.

(2) All lifeboats certified to carry 60 or more, but not over 100, persons shall be either motor lifeboats or shall be fitted with an approved type of hand-propelling gear. Lifeboats carrying more than 100 persons shall be motor lifeboats.

(3) A Class 1 motor lifeboat is one that is fitted with a compression ignition engine, is capable of being readily started in all conditions, and has sufficient fuel for 24 hours continuous operation. The speed ahead in smooth water when loaded with its full complement of persons and equipment shall be at least 6 knots.

(4) A Class 2 motor lifeboat shall meet the Class 1 requirements, and in addition, shall be fitted with a search light constructed in accordance with Subpart 161.006 of Subchapter Q (Specifications) of this chapter.

(5) A Class 3 motor lifeboat shall meet the Class 2 requirements, and in addition, shall be fitted with a radio cabin and a radio installation complying with requirements of the Federal Communications Commission.

(6) All lifeboats, except those installed on vessels in river service, shall be fitted with suitable disengaging apparatus consisting of fixed hooks in the lifeboat or mechanical disengaging apparatus. Mechanical disengaging apparatus, if fitted, shall be of an approved type, constructed in accordance with Subpart 160.033 of Subchapter Q (Specications) of this chapter.

(i) All lifeboats installed on ocean, coastwise, or Great Lakes vessels of over 3,000 gross tons shall be fitted with mechanical disengaging apparatus so arranged as to make it possible for the lifeboats to be launched with their full complement of persons and equipment while such vessels are underway or stopped, and for both ends of the lifeboat to be released simultaneously, under tension or not, by one person. Simultaneous release shall be effected by partially rotating a shaft which shall be continuous and extend from points of contact with the hooks.

(ii) All lifeboats installed on any particular vessel shall be fitted with the same type of releasing gear.

(b) *Liferafts.* (1) All rigid type liferafts shall be of an approved type, constructed in accordance with Subpart 160.018 of Subchapter Q (Specifications) of this chapter. Rigid type liferafts shall not be used as required equipment on vessels on an international voyage.

(2) Type A liferafts shall be stowed on the standard liferaft skids required by § 75.15-10(c)(1) unless specifically noted otherwise.

(3) All inflatable liferafts shall be of an approved type constructed and serviced in accordance with Subpart 160.051 of Subchapter Q (Specifications) of this chapter.

(4) On vessels on an international voyage, each inflatable liferaft shall have a carrying capacity of not less than 6 nor more than 25 persons.

(c) *Lifefloats.* (1) All lifefloats shall be of an approved type, constructed in accordance with Subpart 160.027 of Subchapter Q (Specifications) of this chapter.

(d) *Buoyant apparatus.* (1) All buoyant apparatus shall be of an approved type, constructed in accordance with Subpart 160.010 of Subchapter Q (Specifications) of this chapter.

(e) *Rescue boat.* (1) In general, a suitable rescue boat shall be a small light weight boat of rigid construction, with built-in buoyancy and capable of being readily launched and easily maneuvered. Also it shall be of adequate proportion to permit taking an unconscious person on board without capsizing. A rescue boat and its installation shall be acceptable to the Officer in Charge, Marine Inspection, as suitable for the rescue of persons accidentally falling over the side, or for similar emergency purposes. The size,

shape, installation, and other factors of suitability will be determined with due consideration of the size, arrangement, intended service and crew requirements of the vessel on which it is to be installed.

§ 75.10–10 Requirements for vessels in ocean service.

(a) *Lifeboats.* (1) Except as further noted in this paragraph, all vessels shall be provided with sufficient lifeboats on each side of such aggregate capacity as will accommodate half the total number of persons on board.

(2) Lifeboats shall be not less than 24 feet in length, except where owing to size of the vessel, or for other reasons, the Commandant considers the carriage of such lifeboats to be unreasonable or impracticable. However, in no case shall lifeboats be less than 16 feet in length.

(3) Emergency lifeboats: One of the lifeboats on each side of the vessel shall be of suitable size and design for performing emergency work at sea. Such lifeboats shall be not more than 28 feet in length and the ratio of length to beam shall be not less than 3.3. They shall be kept ready for immediate use while the vessel is at sea.

(4) All vessels shall be provided with the minimum number of motor lifeboats as shown in Table 75.10–10(a)(4). In those cases where at least two motor lifeboats are required, these shall be one on each side. On vessels of over 2,500 gross tons which in the normal course of their voyage are at any point 200 miles offshore, if a Class 3 motor lifeboat is not installed, an approved portable radio unit shall be carried by the vessel in addition to the one required by § 75.55–1.

TABLE 75.10-10(a)(4)

Total number of persons carried		Minimum number Class 2 motor lifeboats	Minimum number Class 3 motor lifeboats
Over	Not over		
----	30	1	----
30	199	2	----
199	1,500	1	1
1,500	----	----	2

(5) On vessels on an international voyage other than a short international voyage, the Commandant may permit liferafts to be substituted for lifeboats required by subparagraph (1) of this paragraph to the extent that there shall never be less than sufficient lifeboats on each side of the vessel to accommodate 37½ percent of the total number of persons on board. In such cases, there shall be provided approved launching devices for these liferafts in accordance with Subpart 75.27.

(6) Where, in the case of vessels on short international voyages it is shown that the carriage of sufficient lifeboat capacity to accommodate all persons on board, as called for by subparagraph (1) of this paragraph, is impracticable, the Commandant may permit a relaxation from this requirement to the extent permitted by Regulations 27 and 28 of Chapter III of the International Convention for the Safety of Life at Sea, 1960, provided the vessel complies fully with the special watertight subdivision requirements of § 73.10–65 of this subchapter.

(7) Vessels not exceeding 150 feet in length which are under 300 gross tons engaged exclusively in the business of transporting passengers to or from operational sites of exploration, development, removal or storage of resources, or related activities thereof, on the continental shelf of the United States in the Gulf of Mexico, in the Atlantic Ocean south of the thirty-third parallel of north latitude, and in the Pacific Ocean, may use approved lifefloats in lieu of lifeboats if a suitable emergency boat is carried and is adequately installed. For the purpose of this subparagraph the word "passengers" is defined as meaning industry personnel engaged exclusively in the exploration, development, removal and storage of resources, or related activities thereof, on the continental shelf of the United States who are required by the nature of their work to ride such vessels. Vessels subject to this subparagraph may also carry supplies, equipment, and cargo.

(8) For vessels not on an international voyage, inflatable liferafts may be substituted for lifeboats on certain vessels in accordance with § 75.10–25.

(b) *Liferafts, lifefloats, and buoyant apparatus.* (1) Vessels on an international voyage other than a short international voyage shall carry, in addition to any other required equipment, approved liferafts with an aggregate capacity of at least 25 percent of the persons on board together with approved buoyant apparatus with an aggregate capacity of at least 3 percent of the persons on board. However, if the factor of subdivision of the vessel is 0.33 or less, liferafts are not required, but approved buoyant apparatus shall be provided with an aggregate capacity of at least 25 percent of the persons on board.

(2) Vessels on a short international voyage shall carry, in addition to any other required equipment, approved liferafts with an aggregate capacity at least equal to 10 percent of the capacity of the lifeboats. In addition, there shall be carried sufficient approved buoyant apparatus so that the aggregate capacity of the buoyant apparatus and liferafts is at least equal to 25 percent of the persons on board.

(3) All vessels not on an international voyage shall be provided with buoyant apparatus sufficient to accommodate 25 percent of all persons on board. Lifefloats not weighing more than 400 pounds or Type A liferafts may be substituted for the buoyant apparatus required.

(4) Inflatable liferafts may be substituted for liferafts, lifefloats and buoyant apparatus on certain vessels not on an international voyage in accordance with § 75.10–25.

§ 75.10–15 Requirements for vessels in coastwise service.

(a) Except as further modified by paragraphs (b) and (d) of this section, all other vessels to which this section pertains shall be provided with sufficient lifeboats and Type A liferafts to accommodate all persons on board. Not less than 75 percent of the total capacity shall be in lifeboats and the remainder may be in liferafts. Such lifeboats shall have a length of at least 16 feet unless otherwise specifically permitted by the Officer in Charge, Marine Inspection, in cases where the crew is insufficient to properly handle lifeboats of such size or where there is insufficient space to properly stow such lifeboats.

(b) In the case of motor vessels of less than 300 gross tons and, if in the opinion of the Commandant it is unreasonable or impracticable to meet the requirements of paragraph (a) of this section, due to the size and arrangement of the vessel and its intended service, the Commandant may prescribe the size, capacity, and number of lifeboats, or other boats of suitable design and construction, liferafts, lifefloats, and/or buoyant apparatus to be carried as in his opinion is reasonable and practicable. In any case, there shall be sufficient total capacity for all persons on board.

(c) Inflatable liferafts may be substituted for lifeboats, liferafts, lifefloats and buoyant apparatus on certain vessels in accordance with § 75.10–25.

(d) Vessels engaged on international voyages shall meet the applicable requirements of § 75.10–10.

§ 75.10–20 Requirements for vessels in Great Lakes; lakes, bays and sounds; or river service.

(a) *General.* All vessels other than ferryboats and passenger barges shall be provided with lifeboats, liferafts, and lifefloats as required by Table 75.10–20(a), except as specifically noted in this paragraph.

(1) Motor vessels of less than 50 gross tons, navigating in daylight only, need not be fitted with lifeboats, liferafts, or lifefloats, provided:

(i) Such vessels are fitted with sufficient air tanks under the decks that the vessel, in its loaded condition, will remain afloat when full of water; or

(ii) Such vessels are fitted with sufficient bulkheads that the vessel, in its loaded condition, will remain afloat with any two compartments damaged.

(2) In the case of a motor vessel in Great Lakes service of less than 300 gross tons, if in the opinion of the Commandant it is unreasonable or impracticable to install the lifeboats, liferafts, or other equipment required by Table 75.10–20(a) due to the size and arrangement of the vessel and its intended service, the Commandant may prescribe the size, capacity, and number of lifeboats or other boats of suitable design and construction, life rafts, and/or life floats to be carried as in his opinion is reasonable and practicable. In any case, there shall be at least one lifeboat or other suitable boat, and there shall be sufficient total capacity for the percentage of all persons on board required to be accommodated by Table 75.10–20(a).

TABLE 75.10-20(a)

	Vessels operating on the Great Lakes				Vessels operating on lakes, bays, and sounds									Vessels operating on rivers	
	Vessels navigating more than 3 miles off shore and where the depth of water on any part of the route is sufficient to submerge the upper deck of the vessel		1. Vessels navigating not more than 3 miles offshore; or 2. Vessels navigating routes where the water is not of a depth on any part of the route to submerge the upper deck of the vessel		Vessels navigating waters other than those tributary to the Pacific Coast of the continental United States, the Atlantic Coast south of the thirty-third parallel of north latitude, and the Gulf of Mexico						Vessels navigating waters tributary to the Pacific Coast of the continental United States, the Atlantic Coast south of the thirty-third parallel of north latitude, and the Gulf of Mexico			Vessels navigating where the average depth of the channel exceeds 3 feet	Vessels navigating where the average depth of the channel does not exceed 3 feet
					Vessels navigating routes, any point of which is more than 3 miles from land, and—				Vessels navigating routes lying at all points within a distance of 3 miles miles from land		Vessels navigating routes, any point of which is more than 3 miles from land, and—		Vessels navigating routes lying at all points within a distance of 3 miles from land		
					1. Depth of water is sufficient to entirely submerge the vessel in case of disaster		2. Depth of water is not sufficient to entirely submerge the vessel in case of disaster				1. Depth of water is sufficient to entirely submerge the vessel in case of disaster	2. Depth of water is not sufficient to entirely submerge the vessel in case of disaster			
Dates (Inclusive)	Winter Sept. 16 to May 14	Summer May 15 to Sept. 15	Winter Sept. 16 to May 14	Summer May 15 to Sept. 15	Winter Oct. 16 to May 14	Summer May 15 to Oct. 15	Winter Nov. 16 to Apr. 14	Summer Apr. 15 to Nov. 15	Winter Nov. 16 to Apr. 14	Summer Apr. 15 to Nov. 15	All year	All year	All year	All year	All year
Percentage of persons (passengers and crew) to be accommodated	Percent 100	Percent 50	Percent 100	Percent 10	Percent [1] 100	Percent [2] 30	Percent 100	Percent 10	Percent 100	Percent 10	Percent [3] 30	Percent 10	Percent 10	Percent 10	Percent None
Percentage of required equipment in lifeboats (minimum)	[3] 75	[4] 40	[3] 25	[3] 25	[3] 25	[3] 25	[3] 25	[3] 25	[3] 25	[3] 25	[3] 25	[3] 25	[3] 25	[4] 25	[4] None
Percentage of required equipment which may be in Type A or Type B liferafts	[5] [6] 25	[5] [7] 60	[5] [6] 75	[5] [7] 75	[5] [6] 75	[5] [6] 75	[5] [6] 75	[5] [6] 75	[5] [6] 75	[5] [6] 75	[5] [6] 75	[5] [6] 75	[5] [6] 75	[5] [6] 75	None

[1] Vessels equipped with radiotelegraph or radiotelephone operating in daylight only and when routes are at all times within a distance of 10 miles from land may, during the interval between the 16th day of October to the 31st day of October, both dates inclusive, carry primary lifesaving equipment to accommodate not less than 30 percent of all persons on board.

[2] Vessels equipped with radiotelegraph or radiotelephone operating in daylight only and whose routes are at all times within a distance of 10 miles from land may, during the interval between the 15th day of May to the 15th day of October, both dates inclusive, carry primary lifesaving equipment to accommodate not less than 15 percent of all persons on board.

[3] Vessels of 200 gross tons and upward shall have 1 working boat with lifeline attached, properly supplied with oars and painter, and kept in good condition at all times and ready for immediate use, in addition to the lifeboats required.

[4] Vessels of 50 gross tons and upward in river service shall have 1 working boat with lifeline attached, properly supplied with oars and painter, and kept in good condition at all times and ready for immediate use, in addition to any lifeboats required.

[5] At least 50 percent of the liferafts shall have a capacity of more than 15 persons each.

[6] Vessels shall have, in addition to all other lifeboats and liferafts required; 1 additional fully equipped Type A or Type B liferaft which shall be stowed (not necessarily on skids) in such a manner that it will float clear in the event of sinking of the vessel. On all vessels of 300 gross tons and over the liferaft shall be not less than 15-person capacity.

[7] Approved lifefloats may be substituted for liferafts on vessels during the interval between May 15 and September 15 in any 1 year, both dates inclusive.

[8] Approved lifefloats may be substituted for liferafts on vessels operated south of the thirty-third parallel of north latitude, and on vessels operated north of the thirty-third parallel of north latitude during the interval between the 15th day of May to the 15th day of October, in any 1 year, both dates inclusive.

[9] Approved lifefloats may be substituted for liferafts.

(3) In the case of vessels of less than 300 gross tons in lakes, bays, sounds, or river service, if in the opinion of the Commandant it is unreasonable or impracticable to install the lifeboats, liferafts, or other equipment required by Table 75.10-20(a) due to the size and arrangement of the vessel and its intended service, the Commandant may prescribe the size, capacity, and number of lifeboats or other boats of suitable design and construction, liferafts, and/or lifefloats to be carried as in his opinion is reasonable and practicable. In any case there shall be at least one lifeboat or other suitable boat, and there shall be sufficient total capacity for the percentage of all persons on board required to be accommodated by Table 75.10-20(a).

(4) Inflatable liferafts may be substituted for lifeboats, liferafts, lifefloats and buoyant apparatus on certain vessels in accordance with § 75.10-25.

(5) Vessels engaged on short international voyages shall meet applicable requirements of § 75.10-10.

(b) *Ferryboats.* (1) Except as otherwise provided in this paragraph, all ferryboats of 50 gross tons and over shall be equipped with lifeboats and liferafts in accordance with Table 75.10-20(b)(1).

TABLE 75.10-20(b)(1)

Size of ferryboat in gross tons		Cubic feet of lifeboatage required [1]
Over	Not over	
----------	150	60
150	300	120
300	600	[2] 240
600	----------	[2] 360

[1] For purposes of determining lifeboat capacity in persons for use in substituting inflatable liferafts in accordance with substitutions permitted by § 75.10-25, allow 10 cubic feet of lifeboatage per person.

[2] One-half of the required lifeboatage may be supplied by liferafts of Type A or B.

(2) Except as otherwise provided in this paragraph, ferryboats of less than 50 gross tons shall be equipped with lifeboats or Type A or B liferafts as in the opinion of the Officer in Charge, Marine Inspection, having jurisdiction may be necessary in case of disaster to secure the safety of all persons on board.

(3) Inflatable liferafts may be substituted for lifeboats, liferafts, lifefloats and buoyant apparatus on certain vessels in accordance with § 75.10-25.

(4) Ferryboats engaged on short international voyages shall meet the applicable requirements of § 75.10-10.

(c) *Passenger barges.* (1) Passenger barges shall be provided with lifeboats or other boats of suitable design and construction of a capacity in the same proportion to the number of persons carried as is required by Table 75.10-20(a).

(2) Passenger barges engaged in excursions shall be provided with 2 lifeboats or other boats of suitable design and construction of not less than 60 cubic feet capacity each.

(3) Inflatable liferafts may be substituted for lifeboats, liferafts, lifefloats and buoyant apparatus on certain vessels in accordance with § 75.10-25.

§ 75.10–25 Inflatable liferafts as an alternate for lifeboats, other liferafts, lifefloats, and buoyant apparatus on certain vessels not on international voyage.

(a) (1) On all vessels inflatable liferafts may be permitted as substitutes for other types of liferafts, lifefloats and buoyant apparatus wherever they may be required.

(2) The capacity of inflatable liferafts carried in place of other liferafts, lifefloats, and buoyant apparatus shall be at least equivalent to that required of the equipment for which substitution is made.

(3) The substitution of inflatable liferafts shall not be made without prior approval of the Officer in Charge, Marine Inspection.

(b) On all vessels less than 3,000 gross tons the substitution of inflatable liferafts for lifeboats may be permitted as follows:

(1) (i) On all vessels under 500 gross tons, inflatable liferafts may be substituted for all required lifeboats.

(ii) The total capacity of the inflatable liferafts shall be at least equal to the total number of persons that the lifeboats would have been required to accommodate. Partial substitution is permissible provided the aggregate lifeboat and inflatable liferaft capacity is sufficient to accommodate the required number of persons, as indicated above.

(iii) Where substitution of inflatable liferafts is made, a suitable rescue boat shall be provided. In the case of partial substitution, a lifeboat may serve as the rescue boat.

(2) (i) On all vessels of 500 gross tons and upwards to 1,600 gross tons, inflatable liferafts may be substituted for all required lifeboats provided two approved lifeboats of a size acceptable to the Officer in Charge, Marine Inspection, suitable for rescue purposes, one on each side, are installed.

(ii) The aggregate lifeboats and inflatable liferaft capacity shall be at least equal to the total number of persons that the lifeboats would have been required to accommodate.

(iii) The launching arrangement and location of the two lifeboats to be used as rescue boats shall be such that they can be readily launched and shall be to the satisfaction of the Officer in Charge, Marine Inspection.

(3) (i) On all vessels of 1,600 gross tons and upwards to 3,000 gross tons, inflatable liferafts may be substituted for all except two of the required lifeboats. These lifeboats shall be of a size acceptable to the Officer in Charge, Marine Inspection, and shall be suitable for rescue purposes. In all cases, two approved lifeboats, one on each side, shall be provided.

(ii) The aggregate lifeboat and inflatable liferaft capacity shall be at least equal to the total number of persons that the lifeboats, for which substitutions are made plus those remaining on board, would have been required to accommodate.

(4) The substitution of inflatable liferafts for lifeboats shall not be made without prior approval of the Officer in Charge, Marine Inspection.

(c) The Commandant may give special consideration to the substitution of approved inflatable liferafts for required lifeboats on vessels of 3,000 gross tons and over.

§ 75.10–90 Vessels contracted for prior to May 26, 1965.

(a) Vessels contracted for prior to May 26, 1965, shall meet the following requirements:

(1) Except as specifically modified by this paragraph, the requirements of §§ 75.10–5 through 75.10–25 shall be complied with insofar as the number and general type of lifesaving equipment is concerned. Existing items of lifesaving equipment previously approved, but not meeting the applicable specifications or requirements set forth in §§ 75.10–5 through 75.10–25 may be continued in service so long as they are maintained in good condition to the satisfaction of the Officer in Charge, Marine Inspection. Minor repairs, alterations, and replacements may be permitted to the same standards as the original installation. However, all new installations or major replacements shall meet the applicable specifications or requirements in this part.

(2) Vessels certificated for ocean service may comply with this subparagraph in lieu of subparagraph (4) of this paragraph. In this respect, vessels with 13 or less lifeboats shall have at least one motor lifeboat; vessels with over 13 but not over 19 lifeboats shall have 2 motor lifeboats, one of which shall have a searchlight and radio cabin; vessels with over 19 lifeboats shall have 2 motor lifeboats, both of which shall have a searchlight and radio cabin. If a vessel with 13 or less lifeboats is of over 2,500 gross tons and in the normal course of its voyage is at any point 200 miles offshore, the motor lifeboat shall be fitted with a radio cabin, or alternately, an approved portable radio unit shall be carried by the vessel in addition to that required by § 75.55–1. Existing motor lifeboat installations with spark ignition engines may be retained, but replacements shall meet current specifications.

(3) The substitution of liferafts for lifeboats permitted by § 75.10–10(a) (5) and (6) shall not apply.

(4) On vessels of over 3,000 gross tons certificated for ocean, coastwise, or Great Lakes service, all replacements of disengaging apparatus shall meet the requirements of § 75.10–5(a)(6)(i). On all other vessels in any service, all of the lifeboats on a particular vessel shall be fitted with the same type of disengaging apparatus.

(5) Vessels certificated for coastwise service the keels of which were laid prior to July 2, 1915, during the interval between May 15 and September 15 in any one year, both dates inclusive, shall have sufficient lifeboats, liferafts, or buoyant apparatus to accommodate all persons on board, not more than 30 percent of which may be in buoyant apparatus and not more than a total of 65 percent may be in liferafts and buoyant apparatus.

Subpart 75.15—Stowage and Marking of Lifeboats, Liferafts, Lifefloats, and Buoyant Apparatus

§ 75.15–1 Application.

(a) The provisions of this subpart, with the exception of § 75.15–90, shall apply to all vessels contracted for on or after May 26, 1965. Vessels contracted for prior to May 26, 1965, shall meet the requirements of § 75.15–90.

§ 75.15–5 General.

(a) The lifeboats, liferafts, lifefloats, and buoyant apparatus shall be readily available in case of emergency, and shall be kept in good working order and available for immediate use at all times when the vessel is being navigated and, insofar as reasonable and practicable, while the vessel is not being navigated. The emergency lifeboats required by § 75.10–10 (a) (3) shall have their sea painters passed along forward on the vessel when at sea.

(b) The decks on which lifeboats, liferafts, lifefloats, and buoyant apparatus are carried shall be kept clear of freight or any other obstructions which would interfere with the immediate launching of the lifesaving appliance.

§ 75.15–10 Stowage.

(a) Lifeboats, liferafts, lifefloats, and buoyant apparatus shall be stowed in such a manner that:

(1) They are capable of being launched in the shortest possible time.

(2) They shall not impede the launching or handling of other lifesaving appliances.

(3) They shall not impede the marshalling of persons at the embarkation stations, or their embarkation.

(4) They shall be capable of being put in the water safely and rapidly even under unfavorable conditions of list and trim.

(b) Lifeboat stowage shall be as follows:

(1) Every lifeboat shall be attached to a separate set of davits.

(2) Suitable access to the lifeboats shall be provided to enable the crew to prepare the lifeboats for launching.

(3) Lifeboats shall be so stowed that embarkation into them may be made rapidly and in good order.

(4) Lifeboats shall not be stowed in the bows of the vessel nor as far aft as to be endangered by the propellers or overhang of the stern.

(5) Lifeboats shall be so stowed that it shall not be necessary to lift them in order to swing out the davits.

(6) Lifeboats may be stowed on more than one deck, provided proper measures are taken to prevent lifeboats on a lower deck being fouled by those stowed on a deck above.

(7) Means shall be provided for bringing the lifeboats against the ship's side and holding them there so that persons may be safely embarked.

(8) Vessels in ocean or coastwise service shall be fitted with skates or other suitable means to facilitate launching against an adverse list of up to 15 degrees. However, skates may be dispensed with if, in the opinion of the

Commandant, the arrangements are such as to insure that the lifeboats can be satisfactorily launched without such skates.

(9) Ocean and coastwise vessels fitted with radial davits shall, when the weather permits, have one of the lifeboats on each side swung out while at sea, griped in to a boom or rail, and ready for immediate use.

(10) On vessels in ocean and coastwise service, where applicable, means shall be provided outside the machinery space to prevent the discharge of water into the lifeboats while they are being lowered. This shall consist of baffles to deflect the water down the vessel's side, or reach rods, or other means to close the discharge openings.

(c) Liferaft stowage shall be as follows:

(1) Liferafts for which approved launching devices are required shall be distributed equally on each side of the ship and shall be stowed so as to be readily accessible to the launching device which serves them. They shall not be stowed in the bows of the vessel nor as far aft as to be endangered by the propellers or overhang of the stern. Such liferafts shall be capable of being put into the water loaded with their full complement of persons and equipment even with unfavorable conditions of trim and a list of 15 degrees either way.

(2) Means shall be provided outside the machinery space to prevent discharge of water into liferafts launched at fixed positions or from approved launching devices.

(3) The liferafts for which approved launching devices are not required shall be capable of being launched even with unfavorable conditions of trim and a list of 15 degrees either way.

(4) On vessels fitted with approved devices for launching liferafts, all liferafts shall be of a size and type which is capable of being launched from such devices.

(5) Type A liferafts shall be stowed on standard skids constructed in accordance with Subpart 160.042 of Subchapter Q (Specifications) of this chapter.

(6) Type B liferafts shall be stowed in such a manner that they may be readily launched.

(7) The additional liferaft required on Great Lakes vessels by Table 75.10–20(a) shall be stowed in such a manner that it will float clear in the event of sinking of the vessel. The requirements of the other subparagraphs in this paragraph need not be complied with for such liferaft.

(8) Inflatable liferafts shall be stowed in such a manner that they will float free in the event of the vessel sinking. Stowage and launching arrangements will be to the satisfaction of the Officer in Charge, Marine Inspection.

(d) Lifefloat and buoyant apparatus stowage shall be as follows:

(1) Lifefloats and buoyant apparatus shall be stowed in such a manner as to be readily launched. Lifefloats and buoyant apparatus exceeding 400 pounds in weight shall be stowed in such a manner as not to require lifting before launching.

(2) Lifefloats and buoyant apparatus shall not be secured to the vessel except by lashings which can be easily slipped. They may be stowed in tiers one above the other, but not more than four high. When stowed in tiers, the separate units shall be kept apart by suitable distance pieces.

(3) Means shall be provided to prevent shifting.

§ 75.15–15 Marking.

(a) Lifeboats, liferafts, lifefloats, and buoyant apparatus shall be marked as required by §§ 78.47–60 and 78.47–63 of this subchapter.

§ 75.15–90 Vessels contracted for prior to May 26, 1965.

(a) Vessels contracted for prior to May 26, 1965, shall meet the following requirements:

(1) The provisions of §§ 75.15–5 through 75.15–15 shall be met except as further set forth in this paragraph.

(2) The requirements of § 75.15–10(b)(8) shall apply unless, in the opinion of the Officer in Charge, Marine Inspection, it is unreasonable or impracticable or the arrangements or construction of the vessel make the use of skates or similar appliances unnecessary.

(3) The requirements of § 75.15–10(b)(10) need only apply if it is deemed reasonable and practicable by the Officer in Charge, Marine Inspection.

(4) Existing vessels having nested lifeboats may continue such arrangements. However, no subsequent modification, replacement, or rearrangement may result in a greater capacity in the nested lifeboats nor a greater number of persons being permitted aboard the vessel.

Subpart 75.20—Equipment for Lifeboats, Liferafts, Lifefloats, and Buoyant Apparatus

§ 75.20–1 Application.

(a) The provisions of this subpart, with the exception of § 75.20–90, shall apply to all vessels contracted for on or after May 26, 1965. Vessels contracted for prior to May 26, 1965, shall meet the requirements of § 75.20–90.

§ 75.20–5 General.

(a) Equipment for lifeboats, liferafts, lifefloats, and buoyant apparatus shall be of good quality, efficient for the purpose they are intended to serve, and kept in good condition.

(b) Lifeboats, liferafts, lifefloats, and buoyant apparatus shall be fully equipped before the vessel is navigated and the equipment shall remain in such lifesaving appliances throughout the voyage. In any case, such lifesaving appliances shall be fully equipped at all times when passengers are on board.

(c) It shall be unlawful to stow in any lifeboat, liferaft, lifefloat or buoyant apparatus, any article not required by this subpart unless such article can be properly stowed so as not to reduce the seating capacity or space available to the occupants and so as not to adversely affect the seaworthiness of such appliances or, in the case of lifeboats, overload the davits or winches.

(d) Loose equipment, except boat hooks in lifeboats, shall be securely attached to the lifesaving appliance to which it belongs.

§ 75.20–10 Required equipment for lifeboats.

(a) The lifeboats for all vessels shall be equipped in accordance with Table 75.20–10(a). For a description of the items contained in this table, and the units comprising the items, see the applicable paragraphs of § 75.20–15. The letter identification prefixing the item in the table corresponds to the paragraph designations in § 75.20–15.

TABLE 75.20–10(a)

Letter identification	Item	Ocean and coastwise	Great Lakes	Lakes, bays and sounds, and rivers
a	Bailer	1	1	None
b	Bilge pump	[1] 1	None	None
c	Boathooks	2	1	1
d	Bucket	2	1	1
e	Compass and mounting	1	None	None
f	Ditty bag	1	None	None
g	Drinking cups	1	None	None
h	Fire extinguishers (motor-propelled lifeboats only).	2	2	2
i	First aid kit	1	None	None
j	Flashlight	1	1	None
k	Hatchets	2	2	1
l	Heaving line	2	None	None
m	Jackknife	1	None	None
n	Ladder, lifeboat gunwale	1	None	None
o	Lantern	1	1	1
p	Lifeline	1	1	1
q	Life preservers	2	2	2
r	Locker	1	1	None
s	Mast and sail (oar-propelled lifeboats only)	1	None	None
t	Matches (boxes)	2	1	1
u	Milk, condensed (pounds per person)	1	None	None
v	Mirrors, signaling	2	None	None
w	Oars	[1] 1 unit	[1] 1 unit	[1] 1 unit
x	Oil, illuminating (quarts)	1	1	None
y	Oil, storm (gallons)	1	1	None
z	Painter	2	2	1
aa	Plugs	1	1	1
bb	Provisions (pounds per person)	2	None	None
cc	Radio installation	[1] 1	None	None
dd	Rowlocks	[1] 1 unit	[1] 1 unit	[1] 1 unit

See footnotes at end of table.

TABLE 75.20-10(a)—Continued

Letter identification	Item	Ocean and coastwise	Great Lakes	Lakes, bays and sounds, and rivers
ee	Rudder and tiller	1	1	None
ff	Sea anchor	1	1	None
gg	Searchlight	[3] 1	None	None
hh	Signals, distress, floating orange smoke	2	None	None
ii	Signals, distress, red hand flare	[2] 1 unit	[2] 1 unit	None
jj	Signals, distress, red parachute flare	[2] [4] 1 unit	[2] 1 unit	None
kk	Tool kit (motor-propelled lifeboats only)	[2] 1 unit	[2] 1 unit	[2] 1 unit
ll	Water (quarts per person)	3	None	None
mm	Whistle, signaling	1	None	None
nn	Fishing kit	1	None	None
oo	Cover, protecting	1	None	None
pp	Signals, lifesaving	1	None	None
qq	Desalting kit	[3] 1	None	None

[1] Motor-propelled lifeboats, certified for 100 or more persons, shall be fitted with an additional hand bilge pump of an approved type or a power bilge pump.
[2] For description of units, see § 75.20-15.
[3] Required only on motor-propelled lifeboats fitted with radio cabin, see § 75.10-5(a)(5).
[4] Vessels in coastwise service need only carry 1 unit for each 5 lifeboats or fraction thereof.
[5] Optional equipment. See § 75.20-15(11), water.

§ 75.20-15 Description of equipment for lifeboats.

(a) *Bailer.* The bailer shall have a lanyard attached and shall be of sufficient size and suitable for bailing.

(b) *Bilge pump.* Bilge pumps shall be of an approved type, constructed in accordance with Subpart 160.044 of Subchapter Q (Specifications) of this Chapter. They shall be of the size given in Table 75.20-15 (b) depending upon the capacity of the lifeboat as determined by the six-tenths rule as described in § 160.035-8 (b) of Subchapter Q (Specifications) of this chapter.

TABLE 75.20-15 (b)

Capacity of lifeboat cubic feet		Bilge pump size
Over	Not over	
----	330	1
330	700	2
700	----	3

(c) *Boathooks.* Boathooks shall be of the single hook ball point type. Boathook handles shall be of clear grained white ash, or equivalent, and of a length and diameter as given in Table 75.20-15(c).

TABLE 75.20-15 (c)

Length of lifeboat, feet		Boathook handles	
Over	Not over	Diameter, inches	Length, feet
----	23	1¼	8
23	29	1¾	10
29	----	2	12

(d) *Bucket.* The bucket shall be of heavy gage galvanized iron, or other suitable corrosion resistant metal, of not less than 2 gallons capacity, and shall have a 6-foot lanyard of 12 thread manila attached.

(e) *Compass and mounting.* The compass and mounting shall be of an approved type constructed in accordance with United States Coast Guard specification dated December 14, 1944.

(f) *Ditty bag.* The ditty bag shall consist of a canvas bag and shall contain a sailmaker's palm, needles, sail twine, marline, and marline spike.

(g) *Drinking cups.* Drinking cups shall be enamel coated or plastic, graduated in ounces, and be provided with lanyards 3 feet in length.

(h) *Fire extinguisher.* Fire extinguishers shall be of approved Type B-C, Size I (see § 76.50-5 of this subchapter). One shall be attached to each end of the lifeboat.

(i) *First aid kit.* The first aid kit shall be of an approved type, constructed and fitted in accordance with Subpart 160.041 of Subchapter Q (Specifications) of this chapter.

(j) *Flashlight.* The flashlight shall be of an approved Type I, Size No. 3, constructed in accordance with Subpart 161.008 of Subchapter Q (Specifications) of this chapter. Three spare cells (or one 3-cell battery) and two spare bulbs, stowed in a watertight container, shall be provided with each flashlight. Batteries shall be replaced yearly during the annual stripping, cleaning, and overhaul of the lifeboat.

(k) *Hatchet.* Hatchets shall be of an approved type, constructed in accordance with Subpart 160.013 of Subchapter Q (Specifications) of this chapter. They shall be attached to the lifeboat by individual lanyards and be readily available for use, one at each end of the lifeboat.

(l) *Heaving line.* The heaving line shall be of adequate strength, 10 fathoms in length, and 1 inch in circumference. It shall be of such quality as to be buoyant after 24 hours submergence.

(m) *Jackknife.* The jackknife (with can opener) shall be of an approved type, constructed in accordance with Subpart 160.043 of Subchapter Q (Specifications) of this chapter.

(n) *Ladder, lifeboat gunwale.* The lifeboat gunwale ladder shall consist of 3 flat wood steps cut out for hand holds. The steps shall be spaced 12 inches apart and fastened with ⅝ inch-diameter manila rope. Each rope end shall be tied inside the lifeboat at about amidships with the ladder stowed on top of the side benches and ready for immediate use. Other suitable devices may be specifically approved.

(o) *Lantern.* The lantern shall contain sufficient oil to burn for at least 9 hours, and shall be ready for immediate use.

(p) *Lifeline.* The lifeline shall be properly secured to both sides of the lifeboat along its entire length, festooned in bights not longer than 3 feet, with a seine float in each bight, which float may be omitted if the line is of an inherently buoyant material and absorbs little or no water. The lifeline shall be of a size and strength not less than ⅜-inch diameter manila. The bights shall hang to within 12 inches of the water when the lifeboat is light.

(q) *Life preservers.* Life preservers shall be of an approved type, constructed in accordance with the applicable subparts of Subchapter Q (Specifications) of this chapter.

(r) *Locker.* The locker shall be suitable for the storage and preservation of the small items of equipment.

(s) *Mast and sail.* A unit, consisting of a standing lug sail together with the necessary spars and rigging, shall be provided in general agreement with Table 75.20-15 (s). The sails shall be of good quality canvas, colored Indian Orange (Cable No. 70072, Standard Color Card of America). Rigging shall consist of galvanized wire rope not less than 3/16 inch in diameter. The sail and gear shall be protected by a suitable canvas cover.

TABLE 75.20-15 (s)

Length of lifeboat, feet		Standing lug sail							Mast [1]		Yard [1]	
Over	Not over	Area square feet	Luff and head length	Leach length	Foot length	Clew to throat	Ounces per square yard	Commercial designation number	Length	Diameter	Length	Diameter
			ft. in.	ft. in.	ft. in.	ft. in.			ft. in.	in.	ft. in.	in.
----	17	58	5 11	12 1	8 10	10 10	14.35	10	11 2	3	6 11	2
17	19	74	6 8	13 8	10 0	12 2	14.35	10	12 6	3	7 8	2
19	21	93	7 5	15 1	11 2	13 8	14.35	10	13 10	3⅛	8 5	2⅛
21	23	113	8 3	16 11	12 4	15 1	14.35	10	15 2	3⅛	9 3	2⅛
23	25	135	9 0	18 6	13 6	16 6	14.35	10	16 6	4	10 0	3
25	27	158	9 9	20 0	14 7	17 10	17.50	8	17 10	4	10 9	3
27	29	181	10 5	21 5	15 7	19 1	17.50	8	19 2	4⅛	11 5	3¼
29	31	203	11 0	22 8	16 6	20 3	20.74	6	20 6	4⅛	12 0	3¼
31	[2]	[2]	[2]	[2]	[2]	[2]	[2]	[2]	[2]	[2]	[2]	[2]

[1] Mast lengths measured from heel to center of upper halyard sheave. Mast diameters measured at thwart. Mast and yard shall be of clear grained spruce, fir, or equivalent.
[2] Subject to special consideration.

(t) *Matches.* A box of friction matches in a watertight container stowed in an equipment locker or secured to the underside of the stern thwart if no locker is fitted.

(u) *Milk, condensed.* One pound of condensed milk shall be provided for each person the lifeboat is certified to carry, to be stowed in lockers or other compartments providing suitable protection.

(v) *Mirrors, signaling.* Signaling mirrors shall be of an approved type.

(w) *Oars.* A unit, consisting of a complement of rowing oars and a steering oar, shall be provided for each lifeboat in accordance with Table 75.20–15 (w), except that motor-propelled and hand-propelled lifeboats need only be equipped with 4 rowing oars and 1 steering oar. In any case, the emergency lifeboats shall be provided with the full complement of oars prescribed by the table. All oars shall be buoyant.

TABLE 75.20–15 (w)

Length of lifeboat, feet		Number of oars		Length of oars, feet	
Over	Not over	Rowing	Steering	Rowing	Steering
----	15	4	1	8	9
15	19	6	1	10	11
19	21	6	1	11	12
21	23	6	1	12	13
23	25	8	1	13	14
25	27	8	1	14	15
27	----	8	1	15	16

(x) *Oil, illuminating.* One quart of illuminating oil shall be provided in a metal container.

(y) *Oil, storm.* One gallon of vegetable, fish, or animal oil shall be provided in a suitable metal container so constructed as to permit a controlled distribution of oil on the water, and so arranged that it can be attached to the sea anchor.

(z) *Painter.* Painters shall be of manila rope not less than 2¾ inches in circumference, or equivalent, and of a length not less than 3 times the distance between the deck on which the lifeboat is stowed and the light draft of the vessel. For lifeboats on vessels in ocean, coastwise, or Great Lakes service one of the painters shall have a long eye splice and shall be attached to the thwart with a toggle. The other painter shall be attached to the stem.

(aa) *Plug.* The automatic drain plug required in the lifeboat shall be provided with a cap or plug attached to the lifeboat by a suitable chain.

(bb) *Provisions.* Two pounds of hard bread or its approved equivalent shall be provided for each person the lifeboat is certified to carry. The provisions shall be packaged in hermetically sealed cans of an approved type. The cans shall be stowed in lockers or other compartments providing suitable protection.

(cc) *Radio installation.* The radio installation shall comply with the requirements of the Federal Communications Commission.

(dd) *Rowlocks.* A unit, consisting of sufficient rowlocks and rowlock sockets for each oar required by Table 75.20–15 (w) plus two additional rowlocks. The rowlocks shall be attached to the lifeboat by separate chains so as to be available for immediate use, except that the two additional spare rowlocks shall be carried in the equipment locker or stowed near the stern if no locker is fitted. The rowlocks and rowlock sockets shall be distributed so as to provide the maximum amount of single banked oars practicable.

(ee) *Rudder and tiller.* The rudder and tiller shall be constructed in accordance with § 160.035–3 (t) in Subpart 160.035 of Subchapter Q (Specifications) of this chapter.

(ff) *Sea anchor.* The sea anchor shall be of an approved type.

(gg) *Searchlight.* The searchlight shall be of an approved type, constructed in accordance with Subpart 161.006 of Subchapter Q (Specifications) of this chapter. If installed on a lifeboat equipped with a radio cabin, it shall be securely mounted to the top of the radio cabin and its source of power shall be capable of operating the light intermittently (10 minutes of continuous operation per hour) for a period of at least 3 hours. Where the power for the radio equipment and the searchlight are derived from the same source, it shall be sufficient to provide for adequate operation of both appliances. On lifeboats without a radio cabin, means shall be provided to mount it readily. The mounting may be of a portable type (stanchion type or collapsible type). The source of power shall be connected with watertight electrical fittings as required in Subpart 111.60 of Subchapter J (Electrical Engineering) of this chapter. When not in use, it shall be securely stowed safely, free from any possible damage. Two spare bulbs shall be provided with each installation.

(hh) *Signals, distress, floating orange smoke.* Two approved floating orange smoke distress signals, constructed in accordance with Subpart 160.022 of Subchapter Q (Specifications) of this chapter. The service use of this equipment shall be limited to three years from date of manufacture, and replacement shall be made no later than the first annual inspection of the vessel after the date of expiration.

(ii) *Signals, distress, red hand flare.* A unit, consisting of twelve approved hand red flare distress signals in a watertight container, constructed in accordance with Subpart 160.021 or Subpart 160.023 of Subchapter Q (Specifications) of this chapter. The service use of this equipment shall be limited to three years from date of manufacture, and replacement shall be made no later than the first annual inspection of the vessel after the date of expiration.

(jj) *Signals, distress, red parachute flare.* A unit, consisting of twelve approved parachute red flare distress signals, with an approved means of projecting them, all contained in a portable watertight container; or twelve approved hand-held rocket-propelled parachute red flare distress signals contained in a portable watertight container. Construction shall be in accordance with Subparts 160.024 and 160.028 or Subpart 160.036 of Subchapter Q (Specifications) of this chapter. The service use of this equipment shall be limited to three years from date of manufacture, and replacement shall be made no later than the first annual inspection of the vessel after the date of expiration.

(kk) *Tool kit.* The tool kit shall consist of at least the following tools contained in a suitable container:

(1) One 12-ounce ball peen hammer.

(2) One screwdriver with 6-inch blade.

(3) One pair 8-inch slip joint pliers.

(4) One 8-inch adjustable end wrench.

(ll) *Water.* (1) For each person the lifeboat is certified to carry, there shall be provided 3 quarts of drinking water consisting of nine approved hermetically sealed containers per person constructed and filled in accordance with Subpart 160.026 of Subchapter Q (Specifications) of this chapter. The service life of this equipment shall be limited to 5 years from date of packing, and replacement of outdated containers shall be made at the first annual inspection of the vessel after the date of expiration. Approved desalting kits capable of producing an equal amount of drinking water may be substituted for not more than one-third of the drinking water required to be carried in the lifeboat.

(2) The drinking water containers shall be stowed in drinking water tanks, lockers, or other compartments providing suitable protection.

(mm) *Whistle, signaling.* The whistle shall be of the ball-type, of corrosion-resistant construction, with a 3-foot lanyard attached, and in good working order.

(nn) *Fishing kit.* The fishing kit shall be of approved type constructed in accordance with Subpart 160.061 of Subchapter Q (Specifications) of this chapter.

(oo) *Cover, protecting.* The protecting cover shall be of a highly visible color, and capable of protecting the occupants against injury by exposure.

(pp) *Table of lifesaving signals.* The table shall be in accordance with the provisions of Chapter V, Regulation 16, of the International Convention for Safety of Life at Sea, 1960, and shall be printed on water resistant paper.

(qq) *Desalting kit.* One or more approved desalting kits may be used as a substitute for one-third of the required amount of drinking water per person, and shall be in accordance with Subpart 160.058 of Subchapter Q (Specifications) of this chapter.

§ 75.20–20 Required equipment for liferafts.

(a) The liferafts for all vessels shall be equipped in accordance with Table 75.20–20(a). For a description of the items contained in this table and the units comprising the items, see the applicable paragraphs of § 75.20–25. The letter identification prefixing the item in the table corresponds to the paragraph designation in § 75.20–25.

TABLE 75.20-20(a)

Letter identification	Item	Ocean and coastwise	Great Lakes	Lakes, bays, sounds, and rivers
a	Boathook	1	1	1
b	Drinking cups	1	None	None
c	Jackknife	1	None	None
d	Lifeline	[1] 1	[1] 1	[1] 1
e	Matches (boxes)	1	1	None
f	Mirrors, signaling	2	None	None
g	Oars	[2] 1 unit	[2] 1 unit	[2] 1 unit
h	Oil, storm (gallons)	1	1	None
i	Painter	1	1	1
j	Provisions (pounds per person)	2	None	None
k	Rowlocks	[2] 1 unit	[2] 1 unit	[2] 1 unit
l	Sea anchor	1	1	None
m	Signals, distress	[2] 1 unit	[2] 1 unit	None
n	Water (quarts per person)	1	None	None
o	Water light	1	1	None

[1] Not required on Type A liferafts.
[2] For description of units see § 75.20-25.
[3] 1 unit here means 6 hand red flare distress signals and 6 parachute red flare distress signals with an approved means of projecting them.

(b) Inflatable liferafts shall be equipped with ocean service equipment for vessels on ocean and coastwise routes and with limited service equipment for vessels on Great Lakes, lakes, bays, sounds, and river routes in accordance with Subpart 160.051 of Subchapter Q (Specifications) of this chapter.

NOTE: Subpart 160.051 of Subchapter Q (Specifications) of this chapter requires the servicing of inflatable liferafts at approved servicing facilities. Included in the servicing at an approved servicing facility is a complete inspection of the required equipment by a marine inspector.

§ 75.20-25 Description of equipment for liferafts.

(a) *Boathook.* Boathooks shall be of the single hook ball point type. Boathook handles shall be of clear grained white ash, or equivalent, not less than 8 feet long and 1½ inches in diameter.

(b) *Drinking cups.* Drinking cups shall be enameled and shall be provided with ⅛ inch cotton lanyard, 3 feet in length.

(c) *Jackknife.* The jackknife (with can opener) shall be of an approved type, constructed in accordance with Subpart 160.043 of Subchapter Q (Specifications) of this chapter.

(d) *Lifeline.* The lifeline shall be properly secured around the sides and ends of the liferaft, festooned in bights not longer than 3 feet, with a seine float in each bight, which float may be omitted if the line is of an inherently buoyant material and aborbs little or no water. The lifeline shall be of a size and strength not less than ⅜-inch diameter manila.

(e) *Matches.* A box of friction matches in a watertight container.

(f) *Mirrors, signaling.* Signaling mirrors shall be of an approved type.

(g) *Oars.* A unit, consisting of 4 rowing oars and one steering oar not less than 8 feet in length shall be provided for liferafts for 7 persons or more. For liferafts for 6 persons or less, a unit shall consist of 2 paddles not less than 5 feet in length.

(h) *Oil, storm.* One gallon of vegetable, fish, or animal oil shall be provided in a suitable metal container so constructed as to permit a controlled distribution of oil on the water, and so arranged that it can be attached to the sea anchor.

(i) *Painter.* Painters shall be of manila rope not less than 2¾ inches in circumference and of a length not less than 3 times the distance between the deck on which the liferafts are stowed and the light draft of the vessel.

(j) *Provisions.* Two pounds of hard bread or its approved equivalent shall be provided for each person the liferaft is certified to carry. The provisions shall be packaged in hermetically sealed cans of an approved type. The cans shall be stowed in compartments providing suitable protection.

(k) *Rowlocks.* A unit consisting of 5 rowlocks attached to the liferaft by separate chains and ready for immediate use, together with proper rowlock sockets so arranged as to provide 4 rowing positions and one steering position with the liferaft floating either side up. Rowlocks and rowlock sockets are not required on liferafts for 6 persons or less.

(l) *Sea anchor.* The sea anchor shall be constructed of good quality canvas or other satisfactory material, and shall be not less than 2 feet in diameter.

(m) *Signals, distress.* A unit, consisting of equipment as specified in subparagraphs (1) to (3) of this paragraph. The service use of this equipment shall be limited to three years from date of manufacture, and replacement shall be made no later than the first annual inspection of the vessel after the date of expiration.

(1) Twelve approved hand red flare distress signals in a watertight container and two approved floating orange smoke distress signals, constructed in accordance with Subparts 160.021 and 160.022 of Subchapter Q (Specifications) of this chapter; or

(2) Twelve approved hand red flare distress signals in a watertight container and 12 approved hand orange smoke distress signals, constructed in accordance with Subparts 160.021 and 160.037 of Subchapter Q (Specifications) of this chapter; or

(3) Twelve approved hand combination flare and smoke distress signals, constructed in accordance with Subpart 160.023 of Subchapter Q (Specifications) of this chapter.

(n) *Water.* (1) For each person the liferaft is certified to carry, there shall be provided one quart of drinking water consisting of 3 approved hermetically sealed containers per person constructed and filled in accordance with Subpart 160.026 of Subchapter Q (Specifications) of this chapter. The service life of this equipment shall be limited to five years from date of packing, and replacement of outdated containers shall be made at the first annual inspection of the vessel after the date of expiration.

(2) The drinking water containers shall be stowed in compartments providing suitable protection.

(o) *Water light.* The water light shall be of an approved type, constructed in accordance with Subparts 160.012 or 161.001 of Subchapter Q (Specifications) of this chapter. The water light shall be attached to the liferaft by a 12-thread manila lanyard 3 fathoms in length.

§ 75.20-30 Required equipment for lifefloats and buoyant apparatus.

(a) The lifefloats and buoyant apparatus for all vessels shall be equipped in accordance with Table 75.20-30(a). For a description of the items contained in this table, and the units comprising the items, see the applicable paragraphs of § 75.20-35. The letter identification prefixing the item in the table corresponds to the paragraph designation in § 75.20-35.

TABLE 75.20-30(a)

Letter identification	Item	Number required for each lifefloat and buoyant apparatus		
		Ocean and coastwise	Great Lakes	Lakes, bays, sounds, and rivers
a	Boathook [1]	1	1	1
b	Lifeline	1	1	1
c	Paddles [1]	4	4	4
d	Painter	1	1	1
e	Water light [2]	1	1	None

[1] Buoyant apparatus need not be equipped with boathook or paddles.
[2] Equipment for 24 persons or less not required to have a water light.

§ 75.20-35 Description of equipment for lifefloats and buoyant apparatus.

(a) *Boathook.* Boathooks shall be of the single hook ball point type. Boathook handles shall be of clear grained white ash, or equivalent, not less than 6 feet long and 1½ inches in diameter.

(b) *Lifeline.* The lifeline shall be properly secured around the sides and ends of the lifefloat or buoyant apparatus, festooned in bights not longer than 3 feet, with a seine float in each bight, which float may be omitted if the line is of an inherently buoyant material and absorbs little or no water. The lifeline shall be of a size and strength not less than ⅜-inch diameter manila.

(c) *Paddles.* Paddles shall be not less than 5 feet long.

(d) *Painter.* (1) The painter for buoyant apparatus shall be of manila rope not less than 2 inches in circumference and of a length not less than 6 feet plus the distance between the deck

on which the buoyant apparatus is stowed and the light draft of the vessel.

(2) The painter for lifefloats shall be of manila rope not less than 2¾ inches in circumference and of a length not less than 3 times the distance between the deck on which the lifefloats are stowed and the light draft of the vessel.

(e) *Water light.* The water light shall be of an approved type, constructed in accordance with Subparts 160.012 or 161.001 of Subchapter Q (Specifications) of this chapter. The water light shall be attached to the lifefloat or buoyant apparatus by a 12-thread manila lanyard 3 fathoms in length.

§ 75.20–90 Vessels contracted for prior to May 26, 1965.

(a) Vessels contracted for prior to May 26, 1965, shall meet the following requirements:

(1) Except as specifically modified by this paragraph, the requirements of §§75.20–5 through 75.20–35 shall be complied with insofar as the number of items of equipment and the method of stowage of the equipment is concerned. Existing items of equipment previously approved, but not meeting the applicable specifications or requirements set forth in §§ 75.-20–5 through 75.20–35 may be continued in service so long as they are maintained in a good condition to the satisfaction of the Officer in Charge, Marine Inspection. All new installations or replacements shall meet the applicable specifications or requirements in this part.

(2) Lifeboats previously approved without automatic drain plugs shall have two plugs or caps attached to the lifeboat by separate chains.

(3) Decked lifeboats shall have no drain holes or plugs, but shall be equipped with two bilge pumps.

(4) On vessels in ocean or coastwise service and contracted for prior to November 19, 1952, unless other approved means are provided to achieve the same purpose, three ½-inch diameter manila grablines shall be fitted extending from gunwale to gunwale under the keel to enable persons to cling to and climb upon the upturned lifeboat. The ends of each grabline shall be securely attached to the side benches or other permanent part of the lifeboat and each grabline shall be made up with figure eight knots spaced approximately 18 inches apart in order to provide hand grips. Means shall be provided for taking up any slack in the grablines.

Subpart 75.25—Davits for Lifeboats

§ 75.25–1 Application.

(a) The provisions of this subpart, with the exception of § 75.25–90, shall apply to all vessels contracted for on or after May 26, 1965. Vessels contracted for prior to May 26, 1965, shall meet the requirements of § 75.25–90.

§ 75.25–5 General.

(a) All gravity and mechanical type davits shall be of an approved type, constructed in accordance with Subpart 160.032 of Subchapter Q (Specifications) of this chapter.

(b) Davits for lifeboats weighing in excess of 5,000 pounds when fully equipped (but without persons), shall be of the gravity type.

(c) All davits shall be so arranged that the lifeboats do not require lifting prior to being swung out.

(d) All davits and necessary gear shall be such as to meet the requirements for the installation test set forth in Subpart 75.35. The design, arrangements, and installation shall be such as to preclude undue delay in getting the lifeboats into the water, and shall be of such strength that the lifeboats can be turned out manned by a launching crew and then safely lowered with the full complement of persons and equipment, with the ship listed to 15 degrees either way and with a 10-degree trim.

(e) Radial davits, where permitted, shall comply with the following requirements:

(1) They shall be fitted with means to prevent them from being jerked from their sockets.

(2) They shall maintain a factor of safety of six based on the weight of the fully equipped and loaded lifeboat, except that the weight of the fully equipped lifeboat alone may be used where the lifeboat is launched before being loaded with passengers and crew.

(3) They shall be fitted with hand gear of sufficient power to insure that the boat can be turned out against a maximum list of 15 degrees.

(4) They shall be shop tested and show no permanent set or undue stress when subjected to a load equal to 2.2 times the working load. In addition, they shall be shop tested with a load equal to 1.1 times the weight of the fully equipped lifeboat with the davit set up to simulate a 15-degree list inboard, and it shall be determined that the hand gear can adequately handle the load in this condition.

(f) Davits shall be so disposed on one or more decks as to permit the lifeboats placed under them to be safely lowered without interference from the operation of any other davits.

(g) On a vessel on which inflatable life rafts have been substituted for lifeboats, a launching device for each lifeboat to be used for rescue purposes shall be installed. Radial type davits or other means may be used in sheltered waters if acceptable to the Officer in Charge, Marine Inspection.

§ 75.25–10 Requirements for vessels in ocean or coastwise service.

(a) All vessels shall be fitted with a set of approved gravity or mechanical davits for each lifeboat carried.

(b) All davit installations shall have two lifelines fitted to a davit span: *Provided*, That the span fitted to the davits which are used to handle the emergency lifeboats required by § 75.10–10(a)(3) shall have four such lifelines. The lifelines shall be of such length as to reach the water at the lightest seagoing draft with the vessel listed 15 degrees either way.

§ 75.25–15 Requirements for vessels in Great Lakes; lakes, bays, and sounds; or river service.

(a) All vessels shall be fitted with a set of approved gravity or mechanical davits for each lifeboat carried, except that on small vessels, radial type davits may be used if specifically approved by the Commandant.

(b) Davit installations on vessels in Great Lakes service shall have at least 2 lifelines fitted to a davit span. The lifelines shall be of such length as to reach the water at the lightest seagoing draft with the vessel listed 15 degrees either way.

§ 75.25–90 Vessels contracted for prior to May 26, 1965.

(a) Vessels contracted for prior to May 26, 1965, shall meet the following requirements:

(1) Except as specifically modified by this paragraph, the requirements of §§ 75.25–5 through 75.25–15 shall be complied with insofar as the number and general type of equipment is concerned. Existing items of equipment previously approved, but not meeting the applicable specifications or requirements set forth in §§ 75.25–5 through 75.25–15 may be continued in service so long as they are maintained in good condition to the satisfaction of the Officer in Charge, Marine Inspection. Minor repairs, alterations, and replacements may be made to the same standards as the original installation. However, all new installations or major replacements shall meet the applicable specifications or requirements in this subpart.

(2) On vessels the keels of which were laid after September 1, 1941, all davits for lifeboats weighing in excess of 5,000 pounds when fully equipped (but without persons) shall be of the gravity type.

(3) Existing vessels having nested lifeboats may continue such arrangements.

Subpart 75.27—Inflatable Liferaft Launching Devices

§ 75.27–1 Application.

(a) The provisions of this subpart shall apply to all vessels on an international voyage on which liferafts were permitted to be substituted for lifeboats under the provisions of § 75.10–10(a)(5).

§ 75.27–5 General.

(a) All launching devices for putting liferafts loaded with persons in the water shall be of an approved type.

(b) The design, arrangement, and installation of all launching devices shall be such as to preclude any undue delay in getting the liferafts safely into the water loaded with their full complement of persons and equipment even with unfavorable conditions of trim and a list of 15 degrees either way. The design shall provide a factor of safety of at least 6 in these conditions, based upon the ultimate strength of the materials.

(c) Launching devices shall be so arranged that after the rafts are loaded with persons, they do not require lifting prior to being swung out or lowered.

(d) Launching devices shall be provided with suitable means for detaching the liferafts from the falls which is operable from inside the liferaft, or by an automatic release which shall operate when the weight of the loaded raft is waterborne; however, such an automatic release shall be limited to rafts which are suspended from a single attachment point.

(e) Launching devices shall be provided with means for rapidly retrieving the falls by hand power.

(f) The number of approved liferaft launching devices required to be provided and the number of liferafts allocated to each launching device shall be as determined by the Commandant, and shall be such that fully loaded liferafts and lifeboats of sufficient capacity to accommodate all persons on board can be put into the water in not more than 30 minutes in calm conditions.

(g) On vessels where approved liferaft launching devices are required, they shall be distributed equally on each side of the vessel, and in no case shall there be less than two launching devices, one on each side.

Subpart 75.30—Lifeboat Winches

§ 75.30–1 Application.

(a) The provisions of this subpart, with the exception of § 75.30–90, shall apply to all vessels contracted for on or after May 26, 1965. Vessels contracted for prior to May 26, 1965, shall meet the requirements of § 75.30–90.

§ 75.30–5 General.

(a) All lifeboat winches shall be of an approved type, constructed in accordance with Subpart 160.015 of Subchapter Q (Specifications) of this chapter.

(b) Where ice conditions are likely to be encountered, suitable fabric covers shall be provided for all lifeboat winches, so fitted over exposed mechanism, that ice formations may be readily broken adrift when necessary to operate the winch.

(c) Where lifeboat winches are used, wire falls shall be employed.

§ 75.30–10 Number and type required.

(a) Lifeboat winches shall be fitted for each set of davits on all vessels where the height of the deck on which lifeboats are carried exceeds 20 feet from the lightest seagoing draft.

(b) Lifeboat winches shall be used in all cases where gravity type davits are employed.

(c) Lifeboat winches for use with gravity davits shall have grooved drums of such size that there will be only one layer of wire on the drums. Lifeboat winches for use with mechanical davits need not have grooved drums, and may be designed to take more than one layer of wire.

(d) Lifeboat winches shall be fitted for each set of davits used for the emergency lifeboats, and in addition to meeting all other requirements for winches, the emergency lifeboat winch shall be capable of recovering the emergency lifeboat with its full complement of persons and equipment at a hoisting speed of not less than 20 feet per minute.

§ 75.30–15 Installation.

(a) Lifeboat winches shall be so located that the operator can observe the movement of the lifeboat during the lowering operation. In addition, any electrical controls provided shall meet the requirements of § 111.65–40 of Subchapter J (Electrical Engineering) of this chapter.

(b) The lead of the falls to the lifeboat winches and length and size of wire shall be in accordance with Subpart 75.33.

§ 75.30–90 Vessels contracted for prior to May 26, 1965.

(a) Vessels contracted for prior to May 26, 1965, shall meet the following requirements:

(1) Except as specially modified by this paragraph, the requirements of §§ 75.30–5 through 75.30–15 shall be complied with insofar as the number and general type of equipment is concerned. Existing items of equipment previously approved, but not meeting the applicable specifications or requirements set forth in §§ 75.30–5 through 75.30–15 may be continued in service so long as they are maintained in good condition to the satisfaction of the Officer in Charge, Marine Inspection. However, all new installations or major replacements shall meet the applicable specifications or requirements in this part.

(2) Vessels certificated for river service need not comply with the requirements of § 75.30–10(a).

(3) Existing arrangements previously approved, but not meeting the requirements of § 75.30–10(d) or § 75.30–15(a), need not be changed. However, new installations or major alterations should conform with such requirements where reasonable and practicable.

(4) Where lifeboat winches are used with gravity davits, the installation shall comply with the requirements contained in § 160.015–3(k), of Subpart 160.015 (Lifeboat Winches) of Subchapter Q (Specifications) of this chapter.

(5) Lifeboat winches for use with nested lifeboats shall be provided with suitable means for rapidly retrieving the falls by handpower unless separate falls are provided for each lifeboat.

Subpart 75.33—Blocks and Falls for Lifeboats

§ 75.33–1 Application.

(a) The provisions of this subpart, with the exception of § 75.33–90, shall apply to all vessels contracted for on or after May 26, 1965. Vessels contracted for prior to May 26, 1965, shall meet the requirements of § 75.33–90.

§ 75.33–5 General.

(a) All blocks, falls, fairleads, padeyes, shackles, links, fastenings, etc., used in connection with lifeboat gear shall be designed with a minimum factor of safety of six, based on the maximum working load.

(b) Falls shall be of such length that the lifeboat may be lowered to the water with the vessel at its lightest draft listed 15 degrees either way.

(c) Falls, where exposed and subject to damage or fouling, shall be suitably protected.

(d) Such blocks or other fittings shall be fitted as are necessary to permit the falls to lead fair in all positions to the davits.

(e) Means for lubrication shall be provided for all moving parts of blocks, sheaves, fairleads, etc.

§ 75.33–10 Installations where lifeboat winches are used.

(a) All falls shall be of wire rope.

(b) Wire rope falls of 6 x 19 regular lay filler wire construction, prelubricated at the factory with suitable neutral wire rope lubricant, shall be accepted as standard. Any other wire rope, superior or equal to this minimum standard may be used.

(c) Not more than 2-part falls may be used, except in special cases where 3-part falls may be permitted by the Commandant.

(d) The lead sheaves to the drum shall be located so as to provide fleet angles of not more than 8 degrees for grooved drums and not more than 4 degrees for nongrooved drums. By fleet angle is meant the angle included between the wire rope from the lead sheave to the drum (or drum extended) when it is perpendicular to the axis of the drum, and the wire rope from the lead sheave to either extremity of the drum.

(e) Sheaves shall have a diameter at the base of the groove at least equal to 12 times the diameter of the wire rope.

§ 75.33–15 Installations where lifeboat winches are not used.

(a) All falls shall be of manila rope or equivalent. Wire rope may not be used.

(b) All vessels of over 1,000 gross tons shall be provided with covered tubs, boxes, or reels for the stowage and protection of the falls, and cruciform bitts shall be provided for properly lowering the lifeboats. Vessels of 1,000 gross tons and less shall have the falls protected from ice and ready for immediate use, and shall be provided with suitable lowering bitts or cleats.

(c) There shall be ample clearance between the cheeks of all blocks. The width between the cheeks shall be one-half inch greater than the diameter of new rope when rope of 3¾-inch circumference or greater is used. Blocks for smaller rope shall be designed with proportional clearances.

§ 75.33–90 Vessels contracted for prior to May 26, 1965.

(a) Vessels contracted for prior to May 26, 1965, shall meet the following requirements:

(1) Except as specifically modified by this paragraph, the requirements of §§ 75.33–5 through 75.33–15, as applicable, shall be complied with insofar as the general type of equipment is concerned. Existing equipment previously approved, but not meeting the detailed requirements of §§ 75.33–5 through 75.33–15 may be continued in service so long as they

are maintained in good condition to the satisfaction of the Officer in Charge, Marine Inspection. Minor repairs, alterations, and replacements may be made to the same standards as the original installation. However, all new installations or major replacements shall meet the applicable requirements in this subpart.

(2) When nested lifeboats are used, the lower blocks shall be of the nontoppling type unless separate falls are provided for each lifeboat. Separate falls shall be provided for each lifeboat in all nested lifeboat installations not using wire falls.

Subpart 75.35—Installation of Lifeboats, Davits, and Winches

§ 75.35–1 Application.

(a) The provisions of this subpart shall apply to all installations contracted for on or after November 19, 1952, except as set forth in § 78.17–60 (c) of this subchapter.

§ 75.35–5 Tests and examinations.

(a) Upon completion of the installation of lifeboats, davits, or winches, tests and examinations as required by this section shall be made to the satisfaction of the inspector before the vessel may be navigated.

(b) The lifeboat shall be swung out from the chocks and lowered to the embarkation deck. At this point the lifeboat shall be loaded with deadweight equivalent to the number of persons allowed (165 pounds per person) together with weight of equipment, plus 10 percent of the total load including the weight of the lifeboat. No persons shall be permitted in the lifeboat while it is being loaded or lowered. The lifeboat shall then be lowered to the water and disengaged from the falls. If nested lifeboats are installed, both lifeboats shall be launched in the manner noted above. The following determinations shall be made:

(1) None of the equipment or parts thereof nor deck connections shall show signs of permanent set or excessive deflection.

(2) Mechanical and radial type davits shall be capable of being swung out without lifting the lifeboat.

(3) The falls shall be of sufficient length to lower the lifeboat as required by § 75.33–5(b).

(4) Where lifeboat winches are used, the following additional determinations shall be made:

(i) During lowering, the lifeboat shall be stopped at intervals of approximately 6 feet by the action of the counterweight alone. The counterweight shall be capable of stopping and holding the lifeboat. The brake action shall be smooth, but positive.

(ii) Brakes exposed to the weather shall be tested under the load conditions with the braking surfaces both wet and dry.

(iii) The governor brake shall be capable of controlling the speed of lowering of the fully equipped lifeboat with its complement of persons on board to not more than 120 feet per minute. In addition, the speed of lowering of the fully equipped lifeboat without its complement of persons shall be not less than 40 feet per minute. However, emergency lifeboats shall have a minimum lowering speed of 60 feet per minute in the fully equipped condition without persons aboard and a maximum lowering speed of 160 feet per minute in the fully equipped condition with the full complement of persons aboard.

(iv) Emergency lifeboat winches required to meet the provisions of § 75.30–10(d) shall be capable of recovering the emergency lifeboats in the fully equipped condition with the full complement of persons aboard at a hoisting speed of not less than 20 feet per minute.

(v) If nesting lifeboats are used, the hand-operated quick-return mechanism shall be tested. The action shall be easy enough for one man to recover the falls.

Subpart 75.37—Installation of Inflatable Liferaft Launching Devices

§ 75.37–1 Application.

(a) The provisions of this subpart shall be applicable to all installations contracted for on or after May 26, 1965, except as specifically noted.

§ 75.37–5 Tests and examinations.

(a) Upon completion of the installation of liferaft launching devices, tests and examinations as required by this section shall be made to the satisfaction of the marine inspector before the vessel may be navigated.

(b) A fully equipped liferaft shall be inflated at its embarkation position. It shall then be loaded with deadweight equivalent to the number of persons allowed (165 pounds per person), plus 10 percent of the total load, which shall include the weight of the fully equipped raft. The liferaft shall then be lowered to the water and disengaged from the falls. Necessary safety precautions shall be taken for persons engaged in the loading of the liferaft. No person shall be allowed in the liferaft while it is being lowered. The following determinations shall be made:

(1) None of the equipment or parts thereof nor deck connections shall show signs of permanent set or excessive deflection.

(2) Arrangements at the embarkation deck shall be such that persons may be rapidly and safely loaded into the liferaft.

(3) The fully loaded liferaft shall be capable of being swung out from the embarkation deck and lowered without lifting.

(4) The falls shall be of sufficient length to lower the liferaft to the light load line with the vessel heeled 15 degrees inboard and with a 10-degree trim.

(5) During lowering, the liferaft shall be stopped at intervals of approximately 6 feet by the action of the counterweight alone. The counterweight shall be capable of stopping and holding the liferaft. The brake action shall be smooth, but positive.

(6) Brakes exposed to the weather shall be tested under the load conditions with the braking surfaces both wet and dry.

(7) The governor brake shall be capable of controlling the speed of lowering the fully equipped liferaft with its complement of persons on board to not more than 120 feet per minute. In addition, the speed of lowering of the fully equipped liferaft without its complement of persons shall be not less than 40 feet per minute.

(8) The hand-operated quick-return mechanism shall be tested. The action shall be easy enough for one man to recover the falls.

(c) Other methods of testing liferaft launching devices to demonstrate compliance with paragraph (b) of this section, which do not involve the launching of a fully loaded raft may be authorized, if in the opinion of the Commandant, such alternate tests adequately demonstrate compliance with the requirements.

Subpart 75.40—Life Preservers

§ 75.40–1 Application.

(a) The provisions of this subpart, with the exception of § 75.40–90, shall apply to all vessels contracted for on or after May 26, 1965.

(b) Vessels contracted for prior to May 26, 1965, shall meet the requirements of § 75.40–90.

§ 75.40–5 General.

(a) All life preservers shall be of an approved type, constructed in accordance with Subparts 160.002, 160.005, or 160.055 of Subchapter Q (Specifications) of this chapter.

(b) All life preservers on vessels on an international voyage shall be provided with a whistle of the ball-type, of corrosion-resistant construction, with a 3-foot lanyard attached, and in good working order. It shall be attached to the life preserver by the lanyard alone without hooks, snaps, clips, etc., and shall extend not less than 15 inches from the life preserver body. While stowed on the life preserver, the whistle lanyard shall be coiled and stopped-off.

§ 75.40–10 Number and type required.

(a) All vessels shall be provided with an approved type life preserver for each person carried and in addition, shall be provided with a number of life preservers suitable for children equal to at least 10 percent of the persons carried.

(b) In addition to the life preservers required by paragraph (a) of this section, all vessels on an international voyage shall be provided with approved type life preservers for 5 percent of the persons carried.

§ 75.40–15 Distribution.

(a) Life preservers, including those especially provided for children, shall be properly distributed throughout the staterooms, berthings, and other places convenient for passengers and crew.

(b) The additional life preservers required by § 75.40–10(b) shall be stowed in conspicuous places on deck.

§ 75.40–20 Stowage.

(a) Lockers, boxes, and closets in which life preservers are stowed shall not be capable of being locked, shall be plainly marked, and the life preservers contained therein shall be readily available.

(b) Life preservers stowed overhead shall be so supported that they can be quickly released and distributed among the passengers. Where life preservers are stowed at a height greater than 7 feet from the deck below, efficient means shall be provided for their immediate release and distribution to be operated by persons standing on the deck.

§ 75.40–25 Notices.

(a) A printed notice, as described in §§ 78.47–47 and 78.47–50 of this subchapter, shall be posted in every passenger cabin and stateroom and in conspicuous places about the decks, informing passengers of the location of life preservers and describing and illustrating the method of donning and adjusting them.

§ 75.40–90 Vessels contracted for prior to May 26, 1965.

(a) Vessels contracted for prior to May 26, 1965, shall meet the following requirements:

(1) Except as specifically modified by this paragraph, the requirements of §§ 75.40–5 through 75.40–25 shall be complied with insofar as the number of items of equipment and the method of stowage and notice is concerned. Existing items of equipment previously approved, but not meeting the applicable specifications or requirements set forth in §§ 75.40–5 through 75.40–25 may be continued in service so long as they are serviceable and in good condition to the satisfaction of the Officer in Charge, Marine Inspection, except that:

(i) All kapok and fibrous glass life preservers which do not have plastic-covered pad inserts, as required by Subparts 160.002 and 160.005 of Subchapter Q (Specifications) of this chapter, shall be removed from service.

(2) Where prior to November 19, 1952, wood floats were substituted for approved type adult life preservers, such wood floats may be continued in service so long as they are serviceable and in good condition to the satisfaction of the Officer in Charge, Marine Inspection, on steam vessels in river service, barges carrying passengers while in tow of a steam vessel in other than ocean or coastwise service, and river ferryboats propelled by steam. Where permitted, wood floats shall be stowed in the most accessible spaces.

(3) All new installations or replacements shall meet the applicable specifications or requirements, except that:

(i) Cork and balsa wood life preservers, constructed in accordance with the applicable provisions of Subpart 160.003 or 160.004 and manufactured as approved life preservers prior to July 1, 1965, may be accepted as new or replacement equipment required by this subchapter if such life preservers are serviceable and in good condition to the satisfaction of the Officer in Charge, Marine Inspection: *Provided, however,* That such life preservers bearing basic Approval No. 160.003 or 160.004 shall not be considered as approved equipment meeting the requirements for those passenger ships on an international voyage, constructed or contracted for on or after May 26, 1965.

Subpart 75.43—Ring Life Buoys and Water Lights

§ 75.43–1 Application.

(a) The provisions of this subpart, with the exception of § 75.43–90, shall apply to all vessels contracted for on or after May 26, 1965. Vessels contracted for prior to May 26, 1965, shall meet the requirements of § 75.43–90.

§ 75.43–5 General.

(a) All ring life buoys shall be of an approved type, constructed in accordance with Subpart 160.009 or 160.050 of Subchapter Q (Specifications) of this chapter.

(b) All water lights shall be of an approved type, constructed in accordance with Subparts 160.012 or 161.001 of Subchapter Q (Specifications) of this chapter.

(c) All self-activating smoke signals shall be of an approved type, constructed in accordance with the requirements of Subpart 160.057 of Subchapter Q (Specifications) of this chapter which shall be capable of producing smoke of a highly visible color for at least 15 minutes.

§ 75.43–10 Number required.

(a) The minimum number of approved 30-inch ring life buoys, and the minimum number of which shall have water lights attached, shall be in accordance with Table 75.43–10 (a).

TABLE 75.43–10 (a)

Length of vessel in feet	Ocean		All services other than ocean	
	Minimum number of ring life buoys	Minimum number of ring life buoys in column 2 which shall have water lights attached	Minimum number of ring life buoys	Minimum number of ring life buoys in column 4 which shall have water lights attached
Column 1	Column 2	Column 3	Column 4	Column 5
Under 100	8	0	2	0
100 and under 200	8	6	4	2
200 and under 300	8	6	6	2
300 and under 400	12	6	12	4
400 and under 600	18	9	18	9
600 and under 800	24	12	24	12
800 and over	30	15	30	15

(b) One of the ring life buoys on each side of the vessel shall have secured to it a line at least 15 fathoms in length. On vessels on an international voyage, the line shall be of a buoyant type.

(c) On vessels on an international voyage, at least two of the ring life buoys with water lights attached as required by Table 75.43–10(a) shall also be provided with an approved self-activated smoke signal and shall be capable of quick release from the navigating bridge.

(d) On vessels on an international voyage, the ring life buoys required by this section shall be orange in color.

§ 75.43–15 Distribution and securing.

(a) All ring life buoys shall be placed so as to be readily accessible to the persons on board, and their positions plainly indicated so as to be known to the persons concerned.

(b) The ring life buoys shall always be capable of being cast loose, and shall not be permanently secured in any way.

§ 75.43–90 Vessels contracted for prior to May 26, 1965.

(a) Vessels contracted for prior to May 26, 1965, shall meet the following requirements:

(1) Except as specifically modified by this paragraph, the requirements of §§ 75.43–5 through 75.43–15 shall be complied with insofar as the number of items of equipment and the method of stowage is concerned. Existing items of equipment previously approved, but not meeting the applicable specifications or requirements set forth in §§ 75.43–5 through 75.43–15 may be continued in service so long as they are maintained in good condition to the satisfaction of the Officer in Charge, Marine Inspection. All new installations or replacements shall meet the applicable specifications or requirements in this subpart.

Subpart 75.45—Line-Throwing Appliances

§ 75.45–1 Application.

(a) The provisions of this subpart, with the exception of § 75.45–90, shall apply to all vessels on an international voyage and all other vessels of 150 gross tons and over certificated for ocean or coastwise service, contracted for on or after November 19, 1952. Such vessels contracted for prior to November 19, 1952, shall meet the requirements of § 75.45–90.

§ 75.45–5 General.

(a) Line-throwing appliances of the impulse-projected rocket type, and the equipment auxiliary thereto, shall be of

an approved type, constructed in accordance with Subpart 160.040 of Subchapter Q (Specifications) of this chapter. The service use of rockets shall be limited to four years from date of manufacture, and replacement shall be made no later than the first annual inspection of the vessel after the date of expiration.

(b) Line-throwing appliances of the shoulder gun type, and the equipment auxiliary thereto, shall be of an approved type, constructed in accordance with Subpart 160.031 of Subchapter Q (Specifications) of this chapter.

§ 75.45–10 Type required.

(a) All vessels shall be fitted with an approved line-throwing appliance of the impulse-projected rocket type. However, vessels of less than 500 gross tons and not on an international voyage may substitute a line-throwing appliance of the shoulder gun type.

§ 75.45–15 Equipment for line-throwing appliances.

(a) The equipment enumerated in this paragraph shall be carried for impulse-projected rocket type line-throwing appliances. Except as noted, the equipment and the appliance shall be stowed together in a suitable case or box:

(1) Four rockets, two of which shall be of the buoyant type.

(2) Four primer-ejector cartridges.

(3) Four service lines, each of a length not less than that specified in the approval of the appliance carried, of 7/32-inch to 9/32-inch diameter, of flax or manila, and having a breaking strength of at least 500 pounds, to be kept in faking boxes or on reels. These lines may be kept either in the box or case with the remainder of the equipment, or be stowed in an accessible location nearby.

(4) One cleaning brush, one can of oil, and twelve wiping patches.

(5) One set of instructions furnished by the manufacturer.

(6) One auxiliary line 1,500 feet of 3-inch circumference manila. This line may be kept either in the box or case with the remainder of the equipment or be stowed in an accessible location nearby.

(b) The equipment enumerated in this paragraph shall be carried for shoulder gun type line-throwing appliances. Except as noted, the equipment and the appliance shall be stowed together in a suitable case or box.

(1) Ten service projectiles.

(2) Twenty-five cartridges.

(3) Four service lines, each not less than 400 feet in length, of 3/8-inch circumference flax or cotton and having a breaking strength of at least 250 pounds, or each not less than 600 feet in length of 1/16-inch or more diameter woven or braided nylon, very flexible, having a breaking strength not less than 140 pounds, or equivalent, to be kept in faking boxes or on reels. These lines may be kept either in the box or case with the remainder of the equipment or be stowed in an accessible location nearby.

(4) One cleaning rod with brush, one can of oil, and twelve wiping patches.

(5) One set of instructions furnished by the manufacturer.

(6) One auxiliary line, 500 feet of 3-inch circumference manila.

§ 75.45–20 Accessibility.

(a) The line-throwing appliance and its equipment shall be kept easily and readily accessible and ready for use. No part of this equipment shall be used for any other purpose.

§ 75.45–25 Service recommendations.

(a) In firing the line-throwing appliances, the operating instructions and safety precautions furnished by the manufacturer should be followed.

§ 75.45–90 Vessels contracted for prior to November 19, 1952.

(a) Vessels of 150 gross tons and over in ocean or coastwise service, and vessels of any tonnage on an international voyage, contracted for prior to November 19, 1952, shall meet the requirements set forth in §§ 75.45–5 through 75.45–25. However, if a Lyle gun type line-throwing appliance is already in service on such vessel, it may be continued in use so long as it is in good and serviceable condition, but may not be replaced by a similar installation. Where Lyle guns are used, the following requirements shall be met:

(1) The equipment enumerated in this subparagraph shall be carried for Lyle gun type line-throwing appliances. The equipment and the gun shall be stowed together in a suitable case or box. If the case or box does not meet the requirements of Subpart 160.038 (Portable Magazine Chest) of Subchapter Q (Specifications) of this chapter, the powder shall be separately stowed in a chest meeting such requirements.

(i) Six service projectiles.

(ii) Eighteen bags (2½ ounces each) of black powder marked "One-half normal charge for Lyle gun, 2½ ounces black powder" in a nonferrous metal screw top container.

(iii) One approved firing attachment with accessories consisting of lanyard, wrench, washer to fit between barrel and shoulder of firing attachment, blank plug for screwing into gun when firing attachment is not in place, cartridge extractor, and 25 primers in a watertight metal box.

(iv) Twenty-five paper wads.

(v) Four service lines, each 1,700 feet in length, of 7/32-inch to 9/32-inch diameter flax or manila, and having a breaking strength of at least 500 pounds, to be kept in faking boxes or on reels.

(vi) One ramrod, 1 wire brush, 1 can of light petrolatum, and 12 wiping patches.

(vii) One tapered wooden plug for muzzle of gun when not in use.

(viii) One set of instructions furnished by the manufacturer of the gun.

(ix) One auxiliary line, 1,500 feet of 3-inch circumference manila.

(2) Accessibility requirements are the same as § 75.45–20.

Subpart 75.50—Embarkation Aids

§ 75.50–1 Application.

(a) The provisions of this subpart, with the exception of § 75.50–90, shall apply to all vessels contracted for on or after May 26, 1965. Vessels contracted for prior to May 26, 1965, shall meet the requirements of § 75.50–90.

§ 75.50–5 Ladders.

(a) Vessels certificated for ocean, coastwise or Great Lakes service shall have ladders as follows:

(1) All ladders required by this paragraph shall be of approved types, constructed in accordance with Subpart 160.017 of Subchapter Q (Specifications) of this chapter.

(2) All vessels shall have an approved Type II (chain suspension) ladder for each set of lifeboat davits, but existing ladders previously approved by the Coast Guard may be continued in service so long as they are maintained in good and serviceable condition. Such ladders shall be kept ready and convenient for use on the lifeboat deck, and shall reach from such deck to the vessel's light water line, no heel assumed.

(3) All vessels certificated for ocean or coastwise service, which normally employ a pilot shall have a ladder for the use of the pilot, in addition to the ladders required by subparagraph (2) of this paragraph. Suitable spreaders, a man rope, and a safety line shall be kept readily available for use in conjunction with the pilot ladder whenever circumstances may so require. When used, the ladder shall be secured in a position so that each step rests firmly against the ship's side, and so the pilot can gain safe and convenient access to the ship after climbing not more than 30 feet. Whenever the distance from sea level is more than 30 feet, access from the pilot ladder to the ship shall be by means of an accommodation ladder or other equally safe and convenient means. Arrangements shall be such that the rigging of the ladder and the embarkation of the pilot is supervised by a responsible officer of the ship and handholds are provided to assist the pilot to pass safely and conveniently from the head of the ladder into the ship or onto the ship's deck. At night a light shining over the side shall be available for use, and the deck at the position where the pilot boards the ship shall be adequately lighted.

(b) Vessels certificated for lakes, bays, and sounds service shall be provided with a suitable ladder for each set of lifeboat davits. Such ladders shall be reversible and free from garment-entangling projections. They shall be kept ready and convenient for use on the lifeboat deck, and shall reach from such deck to the vessel's light water line, no heel assumed.

(c) Vessels certificated for river service shall be provided with suitable ladders to enable passengers to descend conveniently to the lifeboats.

§ 75.50–7 Embarkation aids into inflatable liferafts.

(a) Where inflatable liferafts are substituted for lifeboats, unless freeboard at embarkation point is such that embarkation devices are not necessary, suitable arrangements shall be made for embarkation which shall include sufficient ladders or other suitable devices to facilitate embarkation into the inflatable liferafts when waterborne.

§ 75.50–10 Illumination for lifeboat launching operations.

(a) Provisions shall be made on all vessels on international voyages, and all other vessels where the lifeboat deck is more than 30 feet above the light water line, for readily and continuously available illumination from the vessel of lifeboats when alongside and in process of or immediately after being launched. Details of the illuminating system shall be in accordance with Subchapter J (Electrical Engineering) of this chapter.

§ 75.50–15 Illumination for inflatable liferaft launching operations.

(a) On all vessels on an international voyage there shall be provided for any liferafts for which approved launching devices are carried, means for illuminating the liferafts and their launching gear during the preparation for and during the process of launching, and also for illuminating the water into which the liferafts are launched. In addition, there shall be provided means of illuminating the stowage position of liferafts for which approved launching devices are not carried. Details of the illuminating system shall be in accordance with applicable requirements in Subchapter J (Electrical Engineering) of this chapter.

§ 75.50–90 Vessels contracted for prior to May 26, 1965.

(a) Vessels contracted for prior to May 26, 1965, shall meet the following requirements:

(1) Except as specifically modified by this paragraph, the requirements of §§ 75.50–5 through 75.50–15 shall be complied with insofar as the number of items of equipment and the method of stowage is concerned. Existing items of equipment previously approved, but not meeting the applicable specifications or requirements of §§ 75.50–5 through 75.50–15 may be continued in service so long as they are maintained in good condition to the satisfaction of the Officer in Charge, Marine Inspection. All new installations or replacements shall meet the applicable specifications or requirements in this subpart.

Subpart 75.55—Portable Radio Apparatus

§ 75.55–1 Required on international voyage.

(a) Any vessel on an international voyage shall be provided with a portable radio apparatus complying with the requirements of the Federal Communications Commission, unless at least one lifeboat on each side of the vessel is fitted with a fixed radio installation. The apparatus shall be so designed that it may be used by an unskilled person. Such apparatus shall be kept in the radioroom, chartroom, or other suitable location ready to be moved to one or other of the lifeboats in the event of an emergency. See also § 75.10–10(a)(4).

Subpart 75.90—Ship's Distress Signals

§ 75.90–1 Application.

(a) The provisions of this subpart shall apply to all vessels, except as specifically noted.

§ 75.90–5 Vessels in ocean or coastwise service.

(a) All vessels in ocean service and all vessels in coastwise service shall carry within the pilothouse or on the navigator's bridge, 12 approved hand-held rocket-propelled parachute red flare distress signals constructed in accordance with Subpart 160.036 of Subchapter Q (Specifications) of this chapter.

(b) All vessels under 100 gross tons in coastwise service may carry in lieu of signals required by paragraph (a) of this section within the pilothouse or in other locations considered suitable by the Officer in Charge, Marine Inspection, pyrotechnic signals as follows:

(1) Six hand red flare distress signals and 6 hand orange smoke distress signals; constructed in accordance with Subpart 160.021 and 160.037 of Subchapter Q (Specifications) of this chapter; or

(2) Twelve hand combination flare and smoke distress signals, constructed in accordance with Subpart 160.023 of Subchapter Q (Specifications) of this chapter.

(c) All pyrotechnic signals shall be stowed in a portable watertight container.

(d) The service use of the distress signals shall be limited to a period of 3 years from the date of manufacture, and replacement shall be made no later than the first annual inspection of the vessel after the date of expiration.

§ 75.90–10 Vessels in Great Lakes service.

(a) All vessels of 150 gross tons and over in Great Lakes service shall carry within the pilothouse or on the navigator's bridge, twelve approved hand-held red flare distress signals contained in a portable watertight container, constructed in accordance with Subpart 160.021 or Subpart 160.023 of Subchapter Q (Specifications) of this chapter. The service use of the distress signals shall be limited to a period of three years from date of manufacture, and replacement shall be made no later than the first annual inspection of the vessel after the date of expiration.

PART 76—FIRE PROTECTION EQUIPMENT

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AUTHORITY: The provisions of this Part 76 issued under R.S. 4405, as amended, 4462, as amended; 46 U.S.C. 375, 416. Interpret or apply R.S. 4417, as amended, 4418, as amended, 4426, as amended, 4488, as amended, 4491, as amended, sec. 10, 35 Stat. 428, as amended, 41 Stat. 305, as amended, secs. 1, 2, 49 Stat. 1544, 1545, as amended, sec. 17, 54 Stat. 166, as amended, sec. 3, 54 Stat. 347, as amended, sec. 3, 70 Stat. 152, sec. 3, 68 Stat. 675; 46 U.S.C. 391, 392, 404, 481, 489, 395, 363, 367, 526p, 1333, 390b, 50 U.S.C. 198; E.O. 11239, July 31, 1965, 30 F.R. 9671, 3 CFR, 1965 Supp. Treasury Department Orders 120, July 31, 1950, 15 F.R. 6521; 167-14, Nov. 26, 1954, 19 F.R. 8026; 167-20, June 18, 1956, 21 F.R. 4894; CGFR 56-28, July 24, 1956, 21 F.R. 5659; 167-38, Oct. 26, 1959, 24 F.R. 8857.

Subpart 76.01—Application

§ 76.01-1 General.

(a) The provisions of this part shall apply to all vessels except as specifically noted in this part.

§ 76.01-5 Equipment installed but not required.

(a) Where fire detecting or extinguishing systems or equipment are not required, but are installed, the system or equipment and its installation shall meet the requirements of this part.

Subpart 76.05—Fire Detecting and Extinguishing Equipment, Where Required

§ 76.05-1 Fire detecting systems.

(a) Approved fire detecting systems shall be installed in locations as required by Table 76.05-1(a) on the following vessels:

(1) Any vessel on an international voyage.

(2) Any vessel of more than 150 feet in length having sleeping accommodations for passengers.

(3) Any vessel of 150 feet or less in length, not on an international voyage, having sleeping accommodations for 50 or more passengers. Vessels in this category are not required to have a detecting system in the cargo spaces.

(b) The arrangement and details of the fire detecting systems shall be as set forth in Subparts 76.25 through 76.33.

§ 76.05-5 Manual alarm system.

(a) An approved manual alarm system shall be installed in all areas, other than the main machinery spaces, which are normally accessible to the passengers or crew on any vessel having sleeping accommodations for passengers or on any vessel on an international voyage.

(b) The arrangement and details of the manual alarm system shall be as set forth in Subpart 76.35.

§ 76.05-10 Supervised patrol system.

(a) A supervised patrol or watchman system shall be provided on all vessels as set forth in §§ 78.30-10 and 78.30-15 of this subchapter.

TABLE 76.05-1(a)

Space	Detecting systems	Fixed extinguishing systems
Safety areas		
Wheelhouse or fire-control room	None required [1]	None required.[1]
Stairway and elevator enclosures	do.[1]	Do.[1]
Communication corridors	do.[1]	Do.[1]
Lifeboat embarkation and lowering stations	do.	Do.
Radio room	do.[1]	Do.[1]
Accommodations		
Staterooms, toilet spaces, isolated pantries, etc.	do.[1]	Do.[1]
Offices, lockers, and isolated storerooms	Electric, pneumatic, or automatic sprinkling.[4]	Do.[1]
Public spaces	None required with 30-minute patrol. Electric, pneumatic, or automatic sprinkling with 1 hour patrol.[3]	Do.[1]
Open decks or enclosed promenades	None required	Do.
Service spaces		
Galleys	do.[1]	Do.[1]
Main pantries	do.[1]	Do.[1]
Motion picture booths and film lockers	Electric, pneumatic, or automatic sprinkling.[1 2]	Do.[1 2]
Paint and lamp rooms	Smoke detecting [1]	Carbon dioxide.[6]
Inaccessible baggage, mail, and specie rooms and storerooms.	do.	Do.
Accessible baggage, mail, and specie rooms and storerooms.	Electric, pneumatic, or automatic sprinkling.	None required.[1]
Refrigerated storerooms	None required	Do.
Carpenter, valet, photographic, and printing shops, sales rooms, etc.	Electric, pneumatic, or automatic sprinkling.	Do.[1]
Machinery spaces		
Coal fired boilers: Bunker and boiler space	None required	None required.
Oil fired boilers: Spaces containing oil fired boilers either main or auxiliary, their fuel oil service pumps, and/or such other fuel oil units as the heaters, strainers, valves, manifolds, etc., that are subject to the discharge pressure of the fuel oil service pumps, together with adjacent spaces to which oil can drain.	do.	Carbon dioxide or foam.
Internal combustion or gas turbine propelling machinery spaces.	do.	Carbon dioxide.[6]
Electric propulsive motors or generators of open type	do.	None required.
Enclosed ventilating systems for motors and generators of electric propelling machinery.	do.	Carbon dioxide (in ventilating system).[7]
Auxiliary spaces, internal combustion or gas turbine	do.	Carbon dioxide.[6]
Auxiliary spaces, electric motors or generators	do.	None required.
Auxiliary spaces, steam	do.	Do.
Trunks to machinery spaces	do.	Do.
Fuel tanks	do.	Do.[8]
Cargo spaces		
Inaccessible during voyage (combustible cargo), including trunks (excluding tanks).	Smoke detecting	Carbon dioxide.[6]
Accessible during voyage (combustible cargo)	Smoke detecting, electric, pneumatic or automatic sprinkling.	Automatic or manual sprinkling.
Vehicular deck (except where no overhead deck is 30 feet in length or less).	None required	Manual sprinkling.
Cargo oil tanks	do.	Carbon dioxide or foam.[9]

[1] Vessels of 100 gross tons and over contracted for on or before May 27, 1936, and having combustible joiner work shall be fitted with an automatic sprinkling system, except in relatively incombustible spaces.
[2] Sprinkler heads may be attached to sanitary system provided electrical or pneumatic detecting is installed.
[3] On vessels contracted for prior to November 19, 1952, electric or pneumatic detecting may be substituted.
[4] On vessels contracted for prior to January 1, 1962, a steam smothering system may be accepted. However, although existing steam smothering systems may be repaired, replaced, or extended, no new system contracted for on or after January 1, 1962, will be permitted.
[5] Protection of auxiliary boilers, fuel oil units, valves and manifolds not required on vessels contracted for prior to November 19, 1952.
[6] Not required on vessels of less than 300 gross tons (except on an international voyage) using fuel with a flashpoint higher than 110° F., where the space is normally manned.
[7] Not required on vessels contracted for prior to November 19, 1952.
[8] Not required on vessels of less than 300 gross tons nor on vessels contracted for prior to November 19, 1952, except where fuel, including starting fuel, has a flashpoint of 110° F. or less.
[9] Where fuel having a flashpoint of 110° F. or lower is used, the space containing the fuel tanks shall be protected by a carbon dioxide system.

§ 76.05–15 Fire main system.

(a) Fire pumps, hydrants, hose, and nozzles shall be installed on the following vessels:

(1) On all self-propelled vessels.

(2) After July 1, 1957, on all barges with sleeping accommodations for more than six persons.

(b) The arrangement and details of the fire main system shall be as set forth in Subpart 76.10.

§ 76.05–20 Fixed fire extinguishing systems.

(a) Approved fire extinguishing systems shall be installed, as required by Table 76.05–1(a) on the following vessels:

(1) On all self-propelled vessels.

(2) After July 1, 1957, on all barges with sleeping accommodations for more than six persons.

(b) The arrangements and details of the fixed fire extinguishing systems shall be as set forth in Subparts 76.13 through 76.25.

§ 76.05–25 Hand portable fire extinguishers and semiportable fire extinguishing systems.

(a) Approved hand portable fire extinguishers and semiportable fire extinguishing systems shall be installed on all vessels as set forth in Subpart 76.50.

§ 76.05–30 Sand.

(a) On vessels of over 1,000 gross tons there shall be in each space containing oil fired boilers a metal receptacle containing not less than 10 cubic feet of sand, sawdust impregnated with soda, or other approved dry materials together with a scoop or shaker for distributing the same. On vessels of 1,000 gross tons or less, at least 5 cubic feet of such materials shall be similarly carried.

(b) In lieu of the requirements in paragraph (a) of this section, one B–II fire extinguisher may be substituted.

Subpart 76.10—Fire Main System, Details

§ 76.10–1 Application.

(a) The provisions of this subpart, with the exception of § 76.10–90, shall apply to all fire main installations contracted for on or after May 26, 1965. Installations contracted for prior to May 26, 1965, shall meet the requirements of § 76.10–90.

§ 76.10–5 Fire pumps.

(a) Vessels shall be equipped with independently driven fire pumps in accordance with Table 76.10–5 (a).

TABLE 76.10–5(a)

Gross tons		Minimum number of pumps		Hose and hydrant size, inches	Nozzle orifice size, inches	Length of hose, feet
Over	Not over	International voyage	Other			
------	100	2	1	1½	½	50
100	500	2	1	1½	⅝	50
500	1,500	2	2	1½	⅝	50
1,500	4,000	2	2	[1] 2½	[1] ¾	[1] 50
4,000	------	3	3	[1] 2½	[1] ¾	[1] 50

[1] 75 feet of 1½-inch hose and ⅝-inch nozzles may be used where specified by §76.10–10(b).

(b) Vessels on an international voyage shall have a minimum total fire pump capacity at least equal to two-thirds of the required total bilge pump capacity, but in no case less than that required by this section. Each of the required fire pumps shall have a capacity not less than 80 percent of the total required capacity divided by the number of required pumps.

(c) Each pump shall be capable of delivering water simultaneously from the two highest outlets at a Pitot tube pressure of approximately 50 p. s. i. Where one or both of these outlets is a 1½-inch siamese fitting, both branches of the siamese fitting at each such outlet shall be utilized for the purpose of this requirement.

(d) Fire pumps shall be fitted on the discharge side with relief valves set to relieve at 25 p. s. i. in excess of the pressure necessary to maintain the requirements of paragraph (c) of this section or 125 p. s. i., whichever is greater. Relief valves may be omitted if the pumps, operating under shutoff conditions, are not capable of developing a pressure exceeding this amount.

(e) Fire pumps shall be fitted with a pressure gauge on the discharge side of the pumps.

(f) Fire pumps may be used for other purposes provided at least one of the required pumps is kept available for use on the fire system at all times. Unless specifically approved by the Commandant, no branch lines shall be connected to the fire mains for other than fire and deck wash purposes. Other discharge lines shall lead from a discharge manifold near the fire pump. In no case shall a pump having connection to an oil line be used as a fire pump.

(g) The total area of the pipes leading from a pump shall not be less than the discharge area of the pump.

(h) On vessels with oil fired boilers, either main or auxiliary, or with internal combustion propulsion machinery, where 2 fire pumps are required, they shall be located in separate spaces and the arrangement of pumps, sea connections, and sources of power shall be such as to insure that a fire in any one space will not put all of the fire pumps out of operation. However, in vessels of less than 300 feet in length, where it is shown to the satisfaction of the Commandant that it is unreasonable or impracticable to meet this requirement due to the size or arrangement of the vessel, or for other reasons, the installation of a total flooding carbon dioxide system may be accepted as an alternate method of extinguishing any fire which would affect the powering and operation of at least one of the required fire pumps.

§ 76.10–10 Fire hydrants and hose.

(a) The size of fire hydrants, hose, and nozzles and the length of hose required shall be as noted in Table 76.10–5 (a).

(b) In lieu of the 2½-inch hose and hydrants specified in Table 76.10–5 (a), on vessels over 1,500 gross tons, the hydrants in interior locations may have siamese connections for 1½-inch hose. In these cases the hose shall be 75 feet in length, and only one hose will be required at each fire station; however, if all such stations can be satisfactorily served with 50-foot lengths, 50-foot hose may be used.

(c) On vessels of 1,000 gross tons and over there shall be at least one shore connection to the fire main available to each side of the vessel in an accessible location. Suitable cut-out valves and check valves shall be provided. Suitable adaptors also shall be provided for furnishing the vessel's shore connections with couplings mating those on the shore fire lines. Such vessels on an international voyage, shall be provided with at least one international shore connection. Facilities shall be available enabling such a connection to be used on either side of the vessel. The international shore connection shall be in accordance with specification Subpart 162.034 of Subchapter Q (Specifications) of this chapter.

(d) Fire hydrants shall be of sufficient number and so located that any part of the vessel, other than main machinery spaces, accessible to the passengers or crew while the vessel is being navigated and all cargo holds may be reached with at least two streams of water from separate outlets, at least one of which shall be from a single length of hose. For the purpose of this requirement, all watertight doors and all doors in main vertical zone bulkheads and stairway enclosures shall be closed, although hose ports may be installed in doors other than watertight doors and doors in main vertical zone bulkheads for the passage of the hose. In main machinery spaces, all portions at such spaces shall be capable of being reached by at least two streams of water, each of which shall be from a single length of hose from separate outlets; however, this requirement need not apply to shaft alleys containing no assigned space for the stowage of combustibles. Fire hydrants shall be numbered as required by § 78.47–20 of this subchapter.

(e) All parts of the fire main located on exposed decks shall either be protected against freezing or be fitted with cut-out valves and drain valves so that the entire exposed parts of such piping may be shut off and drained in freezing weather. Except when closed to prevent freezing, such valves shall be sealed open.

(f) The outlet at the fire hydrant shall be limited to any position from the horizontal to the vertical pointing downward, so that the hose will lead horizontally or downward to minimize the possibility of kinking.

(g) Each fire hydrant shall be provided with a single length of hose with nozzle attached and a spanner. A suitable hose rack or other device shall be provided for the proper stowage of the hose. If the hose is not stowed in the open or behind glass so as to be readily seen, the enclosure shall be marked in accordance with § 78.47–20 of this subchapter.

(h) Fire hose shall be connected to the outlets at all times. However, on open decks where no protection is afforded to the hose in heavy weather, or

where the hose may be liable to damage from the handling of cargo the hose may be temporarily removed from the hydrant and stowed in an accessible nearby location.

(i) Fire hose shall not be used for any other purpose than fire extinguishing and fire drills.

(j) Hose nozzle requirements:

(1) All nozzles shall be of good grade bronze or equivalent metal.

(2) Where smooth bore type nozzles are used, they shall have an orifice of the size indicated in Table 76.10-5 (a).

(3) Where combination solid stream and water spray fire hose nozzles are used, they shall be of approved type. New installations and replacements shall be constructed in accordance with Subpart 162.027 of Subchapter Q (Specifications) of this chapter. The detachable applicator shall be stowed adjacent to the fire hydrant, except where combination nozzles are not required, in which case the applicator may be stowed at the discretion of the master.

(4) Except as noted in subparagraph (5), all hose nozzles shall be of either the smooth bore type or the approved type combination nozzle.

(5) On all vessels on an international voyage, and all other vessels of 1,000 gross tons and over, the hose attached to the hydrants in propulsion machinery spaces containing oil-fired boilers, internal combustion machinery, or oil fuel units shall be fitted with an approved combination nozzle. The applicator shall be not more than 6 feet in length.

(6) Where approved combination nozzles are used but not required, the applicator with low velocity fog spray head and the self-cleaning strainer may be fitted but will not be required.

(k) Fire hydrants, nozzles, and other fittings shall have threads to accommodate the hose connections noted in paragraph (i) of this section.

(l) Firehose and couplings requirements:

(1) Couplings shall be of brass, bronze, or other equivalent metal. For installations on vessels contracted for on or after July 1, 1954, National Standard fire hose coupling threads shall be used for the 1½-inch and 2½-inch sizes, i. e., 9 threads per inch for 1½-inch hose and 7½ threads per inch for 2½-inch hose.

(2) Unlined hose shall not be used in the machinery spaces.

(3) All lined and unlined hose installed after January 1, 1961, shall be of fire hose quality, in conformance with Underwriters' Laboratories, Inc., Standard 18 or 19, or Federal Specification JJ-H-571 or ZZ-H-451a. Hose which bears the label of Underwriters' Laboratories, Inc., as inspected lined or unlined fire hose will be accepted as conforming to this requirement.

§ 76.10-15 Piping.

(a) All piping, valves, and fittings shall meet the applicable requirements of Subchapter F (Marine Engineering) of this chapter.

(b) All distribution cut-off valves shall be marked as required by § 78.47-15 of this subchapter.

(c) For vessels on an international voyage, the diameter of the fire main shall be sufficient for the effective distribution of the maximum required discharge from two fire pumps operating simultaneously. This is in addition to § 76.10-5(c). The discharge of this quantity of water through hoses and nozzles at a sufficient number of adjacent hydrants shall be at a minimum Pitot tube pressure of approximately 50 pounds per square inch.

§ 76.10-90 Installations contracted for prior to May 26, 1965.

(a) Installations contracted for prior to May 26, 1965, shall meet the following requirements:

(1) Except as specifically modified by this paragraph, the requirements of §§ 76.10-5 through 76.10-15 shall be complied with insofar as the number and general type of equipment is concerned. Existing equipment previously approved, but not meeting the applicable requirements of §§ 76.10-5 through 76.10-15 may be continued in service so long as they are maintained in good condition to the satisfaction of the Officer in Charge, Marine Inspection. Minor repairs, alterations, and replacements may be permitted to the same standards as the original installation. However, all new installations or major replacements shall meet the applicable requirements in this part.

(2) All vessels contracted for prior to November 19, 1952, shall be fitted with fire pumps, hoses, and nozzles in accordance with Table 76.10-90(a)(2).

TABLE 76.10-90(a)(2)

Gross tons		Minimum number of pumps	Minimum hose and hydrant size, inches	Nozzle orifice size, inches	Length of hose, feet
Over	Not over				
100	4,000	2	[1] 1½	[1] ⅞	[1] 50
4,000	.....	3	[1] 1½	[1] ⅞	[1] 50

[1] May use 50 feet of 2½-inch hose with 1⅛-inch nozzles for exterior stations. May use 75 feet of 1½-inch hose with ⅞-inch nozzles for interior station in which case such interior stations shall have siamese connections.

(3) When reasonable and practicable, where two or more fire pumps are required, they shall not all be located in the same space.

(4) The general requirements of §§ 76.10-5 (c) through (h), 76.10-10 (d) through (i), and § 76.10-15 shall be complied with insofar as is reasonable and practicable.

Subpart 76.13—Steam Smothering System, Details

§ 76.13-1 Application.

(a) In accordance with §§ 76.05-1 and 76.05-20, steam smothering systems are not permitted on vessels contracted for on or after January 1, 1962, nor for new installations on vessels contracted for prior to that date.

(b) Where a steam smothering system is installed, the provisions of this subpart shall apply.

(c) This does not preclude the introduction of steam into such confined spaces as boiler casings or into tanks for steaming out purposes. Such installations are not to be considered as part of any required fire extinguishing system.

§ 76.13-90 Installations contracted for prior to January 1, 1962.

(a) Installations contracted for prior to July 1, 1935, shall meet the following requirements:

(1) Existing arrangements, materials, and facilities previously approved will be considered satisfactory so long as they meet the minimum requirements of this paragraph and they are maintained in good condition to the satisfaction of the Officer in Charge, Marine Inspection. Minor repairs and alterations may be made to the same standard as the original installation.

(2) The main pipes and their branches to the cargo compartments and similar spaces shall be not less than 1½-inch pipe size and shall emanate from not more than two stations in easily accessible locations. If located on the open deck, the distribution manifolds shall be suitably protected by an enclosing cabinet or casing which shall be marked as required by § 78.47-17 of this subchapter. Each branch line shall have a valve at the manifold which shall be marked as required by § 78.47-15 of this subchapter.

(3) Branches to paint lockers and similar small spaces may be taken from the nearest steam supply line and shall be not less than ¾-inch pipe size. The valve shall be marked as required by § 78.47-15 of this subchapter.

(b) Installations contracted for on or after July 1, 1935, but prior to November 19, 1952, shall meet the following requirements:

(1) Existing arrangements, materials and facilities previously approved will be considered satisfactory so long as they meet the minimum requirements of this paragraph and they are maintained in good condition to the satisfaction of the Officer in Charge, Marine Inspection. Minor repairs, and alterations may be made to the same standard as the original installation.

(2) Steam shall be available from the main or auxiliary boilers to provide at least one pound of steam per hour for each 50 cubic feet of gross volume of the largest compartment protected. Where reasonable and practicable, the steam pressure shall be at least 100 p. s. i.

(3) The piping system shall meet the general requirements of subparagraphs (5) through (12) of paragraph (c) of this section insofar as is reasonable and practicable.

(4) The minimum size of distribution piping and the number of branches to the various spaces shall be as given in Table 76.13-90 (b) (4) or by the following formula:

$$D=\sqrt{\frac{C}{30{,}000}} \qquad (1)$$

where:

D=Required diameter of pipe in inches.

C=Volume of compartment in cubic feet.

TABLE 76.13-90 (b) (4)

Volume of compartment in cubic feet		Number of branches to compartment	Pipe size in each branch, inches
Over	Not over		
-------	30,000	1	1
30,000	46,000	1	1¼
46,000	67,000	1	1½
67,000	94,000	2	1¼
94,000	135,000	2	1½
135,000	203,000	3	1½

(5) The minimum size of the steam supply line from the boiler to the distribution manifold shall be as given by the following formula:

$$D=\sqrt{\frac{C}{60{,}000}} \qquad (2)$$

where:

D=Diameter of pipe in inches.
C=Volume of all compartments in cubic feet.

(c) Installations contracted for on or after November 19, 1952, but prior to January 1, 1962, shall meet the following requirements:

(1) Existing arrangements, materials and facilities previously approved will be considered satisfactory so long as they meet the minimum requirements of this paragraph and they are maintained in good condition to the satisfaction of the Officer in Charge, Marine Inspection. Minor repairs and alterations may be made to the same standard as the original installation.

(2) Steam shall be available from main or auxiliary boilers to provide at least one pound of steam per hour for each 12 cubic feet of the gross volume of the largest compartment to be protected.

(3) Although separate piping shall be led to each cargo hold and 'tween deck, for the purpose of determining the amount of steam required, a cargo compartment will be considered as the space between adjacent watertight or firescreen bulkheads and from tank top or lowest deck to the deck head of the uppermost deck on which cargo may be carried. If a trunk extends beyond such deck, the trunk space shall be included. Tonnage openings shall be considered as sealed for this purpose.

(4) A steam pressure of at least 100 p.s.i. shall be available unless specifically approved otherwise.

(5) All piping, valves, and fittings shall meet the applicable requirements of Subchapter F (Marine Engineering) of this chapter.

(6) The distribution piping shall emanate from not more than three stations in easily accessible locations on the weather deck, and shall lead to the lower portion of each cargo hold, cargo 'tween deck, and other compartments protected. However, lines to paint lockers and similar small spaces may be taken from the nearest steam supply line.

(7) The distribution line to each compartment shall be fitted with a shutoff valve. The valve shall be marked as required by § 78.47-15 of this subchapter.

(8) The manifold steam supply line shall be fitted with a master valve at the manifold.

(9) Provisions shall be made for draining the manifold and distribution lines to prevent them from freezing.

(10) If located on the open deck, the distribution manifolds shall be suitably protected by an enclosing cabinet or casing. In any case, it shall be marked as required by § 78.47-17 of this subchapter.

(11) Piping shall not be led into or through spaces accessible to the passengers or crew while the vessel is being navigated, with the exception of machinery spaces and corridors. However, in special cases, arrangements to run piping through such spaces may be specifically approved by the Commandant, provided all joints are welded, suitable expansion bends are provided, and all piping is extra heavy.

(12) Piping shall be used for no other purpose except that it may be incorporated with the fire detecting system, and where suitable provisions are made, it may be used for steaming out tanks.

(13) The minimum size and number of branches to the various spaces shall be as given in Table 76.13-90(c)(13). The distribution piping from the manifold to the branch lines shall have an area approximately equal to the combined areas of the branch lines served.

TABLE 76.13-90 (c)(13)

Volume of spaces in cubic feet		Number of branches to spaces	Pipe size of each branch, inches
Over	Not over		
-------	500	1	¾
500	5,000	1	1
5,000	15,000	1	1¼
15,000	30,000	1	1½
30,000	60,000	2	1½
60,000	100,000	3	1½
100,000	190,000	4	1½

(14) The steam supply line from the boiler to any distribution manifold shall be of sufficient size to supply all the branch lines to the largest compartment and to all adjacent compartments.

Subpart 76.15—Carbon Dioxide Extinguishing Systems, Details

§ 76.15-1 Application.

(a) Where a carbon dioxide extinguishing system is installed, the provisions of this subpart, with the exception of § 76.15-90, shall apply to all installations contracted for on or after November 19, 1952. Installations contracted for prior to November 19, 1952, shall meet the requirements of § 76.15-90.

(b) The requirements of this subpart are based on a "high pressure system", i.e., one in which the carbon dioxide is stored in liquid form at atmospheric temperature. Details for "low pressure systems", i.e., those in which the carbon dioxide is stored in liquid form at a continuously controlled low temperature, may be specifically approved by the Commandant where it is demonstrated that a comparable degree of safety and fire extinguishing ability is achieved.

§ 76.15-5 Quantity, pipe sizes, and discharge rate.

(a) *General.* The amount of carbon dioxide required for each space shall be as determined by the following paragraphs in this section.

(b) *Total available supply.* A separate supply of carbon dioxide need not be provided for each space protected. The total available supply shall be at least sufficient for the space requiring the greatest amount.

(c) *Cargo spaces.* (1) The number of pounds of carbon dioxide required for each space in cubic feet shall be equal to the gross volume of the space in cubic feet divided by 30.

(2) Although separate piping shall be led to each cargo hold and 'tween deck, for the purpose of determining the amount of carbon dioxide required, a cargo compartment will be considered as the space between adjacent watertight or firescreen bulkheads and from the tank top or lowest deck to the deck head of the uppermost space on which cargo may be carried. If a trunk extends beyond such deck, the trunk volume shall be included. Tonnage openings shall be considered as sealed for this purpose.

(3) Branch lines to the various cargo holds and 'tween decks shall not be less than ¾ inch standard pipe size.

(4) No specific discharge rate need be applied to such systems.

(d) *Enclosed ventilation systems for rotating electrical propulsion equipment.* (1) The number of pounds of carbon dioxide required for the initial charge shall be equal to the gross volume of the system divided by 10 for systems having a volume of less than 2,000 cubic feet, and divided by 12 for systems having a volume of 2,000 cubic feet or more.

(2) The piping for the initial charge shall be in accordance with Table 76.15-5 (e) (4), and the discharge of the required amount shall be completed within two minutes.

(3) In addition to the above there shall be sufficient carbon dioxide available to permit delayed discharges of such quantity as to maintain at least a 25 percent concentration until the equipment can be stopped. If the initial discharge is such as to achieve this concentration until the equipment is stopped, no delayed discharge need be provided.

(4) The piping for the delayed discharge shall not be less than ½ inch standard pipe size, and no specific discharge rate need be applied to such systems. On small systems, this pipe may be incorporated with the initial discharge piping.

(e) *Machinery spaces, paint lockers, tanks, and similar spaces.* (1) Except as provided in subparagraph (3) of this paragraph, the number of pounds of carbon dioxide required for each space shall be equal to the gross volume of the space divided by the appropriate factor noted in Table 76.15-5(e)(1). If fuel can drain from the compartment being protected to an adjacent compartment, or if the compartments are not entirely separate, the requirements for both compartments shall be used to determine the amount of carbon dioxide to be provided. The carbon dioxide shall be arranged to discharge into both such compartments simultaneously.

TABLE 76.15-5(e)(1)

Gross volume of compartment, cubic feet		Factor
Over	Not over	
----------	500	15
500	1,600	16
1,600	4,500	18
4,500	50,000	20
50,000	----------	22

(2) For the purpose of the above requirement of this paragraph, the volume of a machinery space shall be taken as exclusive of the normal machinery casing unless the boiler, internal combustion machinery, or fuel oil installations extend into such space in which case the volume shall be taken to the top of the casing or the next material reduction in casing area, whichever is lower. For installations contracted for on or after October 1, 1959, "normal machinery casing" and "material reduction in casing area" shall be defined as follows:

(i) By "normal machinery casing" shall be meant a casing the area of which is not more than 40 percent of the maximum area of the machinery space.

(ii) By "material reduction in casing area" shall be meant a reduction to at least 40 percent of the casing area.

(3) For vessels on an international voyage contracted for on or after May 26, 1965, the amount of carbon dioxide required for a space containing propulsion boilers or internal combustion propulsion machinery shall be as given by subparagraphs (1) and (2) of this paragraph or by dividing the entire volume, including the casing, by a factor of 25, whichever is the larger.

(4) Branch lines to the various spaces shall be as noted in Table 76.15-5(e)(4).

TABLE 76.15-5(e)(4)

Maximum quantity of carbon dioxide required, pounds	Minimum nominal pipe size, inches	Maximum quantity of carbon dioxide required, pounds	Minimum nominal pipe size, inches
100	1½	2,500	2½
225	¾	4,450	3
300	1	7,100	3½
600	1¼	10,450	4
1,000	1½	15,000	4½
2,450	2		

(5) Distribution piping within the space shall be proportioned from the supply line to give proper distribution to the outlets without throttling.

(6) The number, type, and location of discharge outlets shall be such as to give a uniform distribution throughout the space.

(7) The total area of all discharge outlets shall not exceed 85 percent nor be less than 35 percent of the nominal cylinder outlet area or the area of the supply pipe, whichever is smaller. The nominal cylinder outlet area in square inches shall be determined by multiplying the factor 0.0022 by the number of pounds of carbon dioxide required, except that in no case shall this outlet area be less than 0.110 square inch.

(8) The discharge of at least 85 percent of the required amount of carbon dioxide shall be complete within 2 minutes.

§ 76.15-10 Controls.

(a) Except as noted in § 76.15-20 (b), all controls and valves for the operation of the system shall be outside the space protected, and shall not be located in any space that might be cut off or made inaccessible in the event of fire in any of the spaces protected.

(b) If the same cylinders are used to protect more than one hazard, a manifold with normally closed stop valves shall be used to direct the carbon dioxide into the proper space. If cylinders are used to protect only one hazard, a normally closed stop valve shall be installed between the cylinders and the hazard except for systems of the type indicated in § 76.15-5 (e) which contain not more than 300 pounds of carbon dioxide.

(c) Distribution piping to the various cargo spaces shall be controlled from not more than two stations. One of the stations controlling the system for the main machinery space shall be located as convenient as practicable to one of the main escapes from the space. All control stations and the individual valves and controls shall be marked as required by §§ 78.47-15 and 78.47-17 of this subchapter.

(d) Systems of the type indicated in § 76.15-5 (e) shall be actuated by one control operating the valve to the space and a separate control releasing at least the required amount of carbon dioxide. These two controls shall be located in a box or other enclosure clearly identified for the particular space. Those systems installed without a stop valve shall be operated by one control releasing at least the required amount of carbon dioxide.

(e) Where provisions are made for the simultaneous release of a given amount of carbon dioxide by operation of a remote control, provisions shall also be made for manual control at the cylinders. Where gas pressure from pilot cylinders is used as a means for releasing the remaining cylinders, not less than two pilot cylinders shall be used for systems consisting of more than two cylinders. Each of the pilot cylinders shall be capable of manual control at the cylinder, but the remaining cylinders need not be capable of individual manual control.

(f) Systems of the type indicated in § 76.15-5 (e), other than systems for tanks, which are of more than 300 pounds of carbon dioxide, shall be fitted with an approved delayed discharge so arranged that the alarm will be sounded for at least 20 seconds before the carbon dioxide is released into the space. Such systems of not more than 300 pounds of carbon dioxide shall also have a similar delayed discharge, except for those systems for tanks and for spaces which have a suitable horizontal escape. This paragraph shall be applicable only to systems installed on or after July 1, 1957.

(g) All distribution valves and controls shall be of an approved type. All controls shall be suitably protected.

(h) Complete but simple instructions for the operation of the system shall be located in a conspicuous place at or near the releasing control device.

(i) If the space or enclosure containing the carbon dioxide supply or controls is to be locked, a key to the space or enclosure shall be in a break-glass-type box conspicuously located adjacent to the opening.

§ 76.15-15 Piping.

(a) The piping, valves, and fittings shall have a bursting pressure of not less than 6,000 p. s. i.

(b) All piping, in nominal sizes not over ¾ inch, shall be at least Schedule 40 (standard weight), and in nominal sizes over ¾ inch, shall be at least Schedule 80 (extra heavy).

(c) All piping, valves, and fittings of ferrous materials shall be protected inside and outside against corrosion unless specifically approved otherwise by the Commandant.

(d) A pressure relief valve or equivalent set to relieve between 2,400 and 2,800 p. s. i. shall be installed in the distributing manifold or such other location as to protect the piping in the event that all branch line shut-off valves are closed.

(e) All dead end lines shall extend at least 2 inches beyond the last orifice and shall be closed with cap or plug.

(f) All piping, valves, and fittings shall be securely supported, and where necessary, protected against injury.

(g) Drains and dirt traps shall be fitted where necessary to prevent the accumulation of dirt or moisture. Drains and dirt traps shall be located in accessible locations where possible.

(h) Piping shall be used for no other purpose except that it may be incorporated with the fire detecting system.

(i) Piping passing through living quarters shall not be fitted with drains or other openings within such spaces.

(j) Installation test requirements:

(1) Upon completion of the piping installation, and before the cylinders are connected, a pressure test shall be applied as set forth in this paragraph. Only carbon dioxide or other inert gas shall be used for this test.

(2) The piping from the cylinders to the stop valves in the manifold shall be subjected to a pressure of 1,000 p. s. i. With no additional gas being introduced to the system, it shall be demonstrated that the leakage of the system is such as not to permit a pressure drop of more than 150 p. s. i. per minute for a 2-minute period.

(3) The individual branch lines to the various spaces protected shall be subjected to a test similar to that described in the preceding subparagraph with the exception that the pressure used shall be 600 p. s. i. in lieu of 1,000 p. s. i. For the purpose of this test, the distribution piping shall be capped within the space protected at the first joint ahead of the nozzles.

(4) In lieu of the tests prescribed in the preceding subparagraphs in this paragraph, small independent systems protecting spaces such as emergency generator rooms, lamp lockers, etc., may be tested by blowing out the piping with air at a pressure of at least 100 p. s. i.

§ 76.15–20 Carbon dioxide storage.

(a) Except as provided in paragraph (b) of this section, the cylinders shall be located outside the spaces protected, and shall not be located in any space that might be cut off or made inaccessible in the event of a fire in any of the spaces protected.

(b) Systems of the type indicated in § 76.15–5 (e), consisting of not more than 300 pounds of carbon dioxide, may have the cylinders located within the space protected. If the cylinder stowage is within the space protected, the system shall be arranged in an approved manner to be automatically operated by a heat actuator within the space in addition to the regular remote and local controls.

(c) The space containing the cylinders shall be properly ventilated and designed to preclude an anticipated ambient temperature in excess of 130 degrees F.

(d) Cylinders shall be securely fastened and supported, and, where necessary, protected against injury.

(e) Cylinders shall be so mounted as to be readily accessible and capable of easy removal for recharging and inspection. Provisions shall be available for weighing the cylinders.

(f) Where subject to moisture, cylinders shall be so installed as to provide a space of at least 2 inches between the flooring and the bottom of the cylinders.

(g) Cylinders shall be mounted in an upright position or inclined not more than 30 degrees from the vertical. However, cylinders which are fitted with flexible or bent syphon tubes may be inclined not more than 80 degrees from the vertical.

(h) Where check valves are not fitted on each independent cylinder discharge, plugs or caps shall be provided for closing outlets when cylinders are removed for inspection or refilling.

(i) All cylinders used for storing carbon dioxide shall be fabricated, tested, and marked in accordance with the regulations of the Interstate Commerce Commission as noted in § 147.04–1 of Subchapter N (Dangerous Cargoes) of this chapter.

§ 76.15–25 Discharge outlets.

(a) Discharge outlets shall be of an approved type.

§ 76.15–30 Alarms.

(a) Spaces which are protected by a carbon dioxide extinguishing system and are normally accessible to persons on board while the vessel is being navigated, other than paint and lamp lockers and similar small spaces, shall be fitted with an approved audible alarm in such spaces which will be automatically sounded when the carbon dioxide is admitted to the space. The alarm shall be conspicuously and centrally located and shall be marked as required by § 78.47–9 of this subchapter. For systems installed on or after July 1, 1957, alarms will be mandatory only for systems required to be fitted with a delayed discharge. Such alarms shall be so arranged as to sound during the 20 second delay period prior to the discharge of carbon dioxide into the space, and the alarm shall depend on no source of power other than the carbon dioxide.

§ 76.15–35 Enclosure openings.

(a) Where mechanical ventilation is provided for spaces other than cargo and similar spaces which are protected by a carbon dioxide extinguishing system, provisions shall be made so that the ventilation system is automatically shutdown with the operation of the system to that space.

(b) Where natural ventilation is provided for spaces protected by a carbon dioxide extinguishing system, provisions shall be made for easily and effectively closing off the ventilation.

(c) Means shall be provided for closing all openings to the space protected from outside such space. In this respect, relatively tight doors, shutters, or dampers shall be provided for openings in the lower portion of the space. The construction shall be such that openings in the upper portion of the space can be closed off either by permanently installed means or by the use of canvas or other material which is normally carried by the vessel.

§ 76.15–40 Pressure relief.

(a) Where necessary, relatively tight compartment such as refrigeration spaces, paint lockers, etc., shall be provided with suitable means for relieving excessive pressure accumulating within the compartment when the carbon dioxide is injected.

§ 76.15–90 Installations contracted for prior to November 19, 1952.

(a) Installations contracted for prior to November 19, 1952, shall meet the following requirements:

(1) Existing arrangements, materials, and facilities previously approved shall be considered satisfactory so long as they meet the minimum requirements of this paragraph and they are maintained in good condition to the satisfaction of the Officer in Charge, Marine Inspection. Minor repairs and alterations may be made to the same standards as the original installation.

(2) The details of the systems shall be in general agreement with §§ 76.15–5 through 76.15–40 insofar as is reasonable and practicable, with the exception of § 76.15–5 (e) (1), (2) and (4), covering spaces other than cargo spaces, which systems may be installed in accordance with subparagraphs (3) through (6) of this paragraph.

(3) In boilerrooms, the bilges shall be protected by a system discharging principally below the floor plates. Perforated pipe may be used in lieu of discharge nozzles for such systems. The number of pounds of carbon dioxide shall be equal to the gross volume of the boiler room taken to the top of the boilers divided by 36. In the event of an elevated boilerroom which drains to the machinery space, the system shall be installed in the engine room bilge and the gross volume shall be taken to the flat on which the boilers are installed.

(4) In machinery spaces where main propulsion internal combustion machinery is installed, the number of pounds of carbon dioxide required shall be equal to the gross volume of the space taken to the underside of the deck forming the hatch opening divided by 22.

(5) In miscellaneous spaces other than cargo or main machinery spaces, the number of pounds of carbon dioxide required shall be equal to the gross volume of the space divided by 22.

(6) Branch lines to the various spaces, other than cargo and similar spaces, shall be as noted in Table 76.15–90 (a) (6). This table is based on cylinders having discharge outlets and siphon tubes of ⅜-inch diameter.

TABLE 76.15–90 (a) (6)

Number of cylinders		Nominal pipe size	
Over	Not over	Inches	Type
----	2	½	Standard.
2	4	¾	Do.
4	6	1	Extra heavy.
6	12	1¼	Do.
12	16	1½	Do.
16	27	2	Do.
27	39	2½	Do.
39	60	3	Do.
60	80	3½	Do.
80	104	4	Do.
104	165	5	Do.

Subpart 76.17—Foam Extinguishing Systems, Details

§ 76.17–1 Application.

(a) Where a foam extinguishing system is installed, the provisions of this subpart, with the exception of § 76.17–90, shall apply to all installations contracted for on or after November 19, 1952. Installations contracted for prior to November 19, 1952, shall meet the requirements of § 76.17–90.

§ 76.17–5 Quantity of foam required.

(a) *Area protected.* (1) For machinery and similar spaces, the system shall be so designed and arranged as to spread a blanket of foam over the entire tank top or bilge of the space protected. The arrangement of piping shall be such as to give a uniform distribution over the entire area protected.

(2) Where an installation is made to protect an oil fired boiler installation on a flat which is open to or can drain to the lower engine room or other space, both the flat and the lower space shall be protected simultaneously. The flat shall be fitted with suitable coamings on all openings other than deck drains to properly restrain the oil and foam at that level. Other installations of a similar nature will be considered in a like manner.

(3) Where a system is installed to protect a tank, it shall be so designed and arranged as to spread a blanket of foam over the entire liquid surface of the tank within the range of usual trim. The arrangement of piping shall be such as to give a uniform distribution over the entire area protected.

(b) *Rate of application.* (1) For spaces other than tanks, the rate of discharge to foam outlets protecting the

hazard shall be at least as set forth in this subparagraph.

(i) For chemical foam systems with stored "A" and "B" solutions, a total of at least 1.6 gallons per minute of the two solutions shall be discharged for each 10 square feet of area protected.

(ii) For other types of foam systems, the water rate to the dry powder generators or air foam production equipment shall be at least 1.6 gallons per minute for each 10 square feet of area protected.

(2) For tanks, the rate of discharge to foam outlets protecting the hazard shall be as set forth in subparagraph (1) of this paragraph, except that the value of 1 gallon per minute shall be substituted in both cases for the value of 1.6 gallons per minute.

(c) *Supply of foam producing material.* (1) There shall be provided a quantity of foam producing material sufficient to operate the equipment at the discharge rate specified in paragraph (b) of this section for a period of at least 3 minutes for spaces other than tanks, and for at least 5 minutes for tanks.

(2) A separate supply of foam agent need not be provided for each space protected. The total available supply shall be at least sufficient for the space requiring the greatest amount.

(3) Where pumps are required, the water supply shall be from outside the space protected and shall in no way be dependent upon power from the space protected.

§ 76.17–10 Controls.

(a) The foam agent, its container, and all controls and valves for the operation of the system shall be of an approved type.

(b) The foam agent container and all controls and valves for the operation of the system shall be outside the space protected and shall not be located in such space as might be cut off or made inaccessible in the event of fire in any of the spaces protected. The control space shall be as convenient as practicable to one of the main escapes from spaces protected, and shall be marked as required by § 78.47–17 of this subchapter. Where pumps are required, it shall not be necessary that they be started from the control space.

(c) Complete, but simple instructions for the operation of the system shall be located in a conspicuous place at or near the controls.

(d) The valves to the various spaces served shall be marked as required by § 78.47–15 of this chapter.

§ 76.17–15 Piping.

(a) All piping, valves, and fittings shall meet the applicable requirements of Subchapter F (Marine Engineering) of this chapter.

(b) All piping, valves, and fittings of ferrous materials shall be protected inside and outside against corrosion unless specifically approved otherwise by the Commandant.

(c) All piping, valves, and fittings shall be securely supported, and where necessary, protected against injury.

(d) Drains and dirt traps shall be fitted where necessary to prevent the accumulation of dirt or moisture.

(e) Piping shall be used for no other purpose.

§ 76.17–20 Discharge outlets.

(a) Discharge outlets shall be of an approved type.

§ 76.17–25 Additional protection required.

(a) In order that any residual fires above the floor plates may be extinguished when a foam system is installed for the protection of spaces other than tanks, at least 2 fire hydrants, in addition to those required for the machinery space by Subpart 76.10, shall be installed outside of the machinery space entrances. Such hydrants shall be fitted with sufficient hose so that any part of the machinery space may be reached with at least 2 streams of water, and each hose shall be equipped with an approved combination nozzle, applicator, and self-cleaning strainer as described in § 76.10–10(j)(3).

§ 76.17–90 Installations contracted for prior to November 19, 1952.

(a) Installation contracted for prior to November 19, 1952, shall meet the following requirements:

(1) Existing arrangements, materials, and facilities previously approved shall be considered satisfactory so long as they meet the minimum requirements of this paragraph and they are maintained in good condition to the satisfaction of the Officer in Charge, Marine Inspection. Minor repairs and alterations may be made to the same standards as the original installation.

(2) The details of the systems shall be in general agreement with §§ 76.17–5 through 76.17–20, with the exception of § 76.17–5 (a) (2), insofar as is reasonable and practicable. A 6-inch blanket of foam in 5 minutes for tanks and 3 minutes for other spaces will be considered as meeting the requirements of § 76.17–5.

Subpart 76.23—Manual Sprinkling System, Details

§ 76.23–1 Application.

(a) Where a manual sprinkling system is installed, the provisions of this subpart, with the exception of § 76.23–90, shall apply to all installations contracted for on or after November 19, 1952. Installations contracted for prior to November 19, 1952, shall meet the requirements of § 76.23–90.

§ 76.23–5 Zoning.

(a) Separate zones may be used for each deck, and on any particular deck, spaces separated by "A" or "B" Class bulkheads may be separately zoned.

(b) On any particular deck, large common areas may be zoned in accordance with Table 76.23–5 (b). All such zones within one common area shall be of approximately the same size. Zones of this type shall overlap in such a manner that the end sprinkler heads of both adjoining zones will cover the identical area.

TABLE 76.23–5 (b)

Square feet of common deck area		Maximum number of zones
Over	Not over	
----	800	1
800	1,800	2
1,800	3,000	3
3,000	5,000	4
5,000	9,000	5
9,000	16,000	6
16,000	30,000	7
30,000	----------	8

§ 76.23–10 Quantity, pipe sizes, and discharge rates.

(a) *General.* (1) The system shall be so designed and arranged that the overhead is effectively sprayed and all portions of the deck are covered. The capacity shall be such that at least 12 gallons of water per minute are applied to each 100 square feet of deck area.

(2) Piping, fittings, sprinkler heads, and pumps installed in accordance with the remainder of this section will be considered as meeting the above requirements. If alternate sizes or arrangements are used, it shall be demonstrated that these minimum requirements have been met.

(b) *Sprinkler heads.* (1) Three-eighth inch open type sprinkler heads shall be used. Sprinkler heads shall be so arranged that no portion of the overhead is more than 7 feet from a sprinkler head.

(c) *Pipe sizes.* (1) The various pipe sizes shall be in proportion to the number of heads served. Minimum pipe sizes shall be as given in Table 76.23–10 (c).

TABLE 76.23–10 (c)

Number of ¾ inch heads served		Minimum nominal pipe sizes, inches
Over	Not over	
----	1	¾
1	2	1
2	4	1¼
4	6	1½
6	12	2
12	18	2½
18	30	3
30	46	3½
46	66	4
66	120	5

(d) *Fire pumps.* (1) The fire pumps may be used for the sprinkling system provided there is sufficient total capacity to operate the largest zone of the sprinkling system with a Pitot tube pressure of at least 15 p. s. i. at all heads and at the same time to deliver water from the two highest fire hose outlets in a manner similar to that described in § 76.10–5 (c). In addition, on vessels over 750 gross tons, there shall be sufficient pumping capacity to also operate the second largest zone.

§ 76.23–15 Controls.

(a) The controls for the system shall be outside the spaces protected, and shall not be located in such space as might be cut off or made inaccessible in the event of fire in any of the spaces protected. The control space shall be marked as required by § 78.47–15 of this

subchapter. It shall not be necessary to start the pumps from the control space.

(b) Distribution piping to the various zones shall be controlled from one station. Each branch line to the various zones shall be fitted with a stop valve which shall be marked as required by § 78.47–15 of this subchapter.

§ 76.23–20 Piping.

(a) All piping, valves, and fittings shall meet the applicable requirements of Subchapter F (Marine Engineering) of this chapter.

(b) All piping, valves, and fittings of ferrous materials shall be protected inside and outside against corrosion unless specifically approved by the Commandant.

(c) All piping, valves, fittings, and sprinkler heads shall be securely supported, and where necessary, protected against injury.

(d) Drains and dirt traps shall be fitted where necessary to prevent the accumulation of dirt or moisture.

(e) Piping shall be used for no other purpose.

§ 76.23–25 Sprinkler heads.

(a) Sprinkler heads shall be of an approved type.

§ 76.23–90 Installations contracted for prior to November 19, 1952.

(a) Installations contracted for prior to November 19, 1952, shall meet the following requirements:

(1) Existing arrangements, materials, and facilities previously approved shall be considered satisfactory so long as they meet the minimum requirements of this paragraph and they are maintained in good condition to the satisfaction of the Officer in Charge, Marine Inspection. Minor repairs and replacements may be made to the same standards as the original installation.

(2) The details of the system shall be in general agreement with §§ 76.23–5 through 76.23–25 insofar as is reasonable and practicable. Existing piping, pumping facilities, and sprinkler heads or perforated pipes may be retained provided all portions of the overhead are effectively sprayed and all portions of the deck are covered.

Subpart 76.25—Automatic Sprinkling System, Details

§ 76.25–1 Application.

(a) Where an automatic sprinkling system is installed, the provisions of this subpart, with the exception of § 76.25–90, shall apply to all installations contracted for on or after November 19, 1952. Installations contracted for prior to November 19, 1952, shall meet the requirements of § 76.25–90.

§ 76.25–5 Zoning.

(a) The automatic sprinkling system shall be divided into separate zones to restrict the area covered by any particular alarm signal.

(b) No sprinkling zone shall contain more than 250 sprinkler heads.

(c) The sprinkling zone may cover more than one deck, in which case, the boundaries shall be maintained in a vertical line insofar as is reasonable and practicable. The boundaries of the zone shall be coincident with bulkheads of Class "A" construction such as main vertical zone or watertight bulkheads.

(d) Spaces in different main vertical zones shall not be included in the same sprinkling zone.

§ 76.25–10 Size and arrangement of sprinkler heads and pipe sizes.

(a) *General.* (1) The system shall be so designed and arranged that the overhead is effectively sprayed and that all portions of the deck are covered.

(2) One-half inch sprinkler heads shall be used. Sprinkler heads shall be so arranged that no portion of the overhead or vertical projection of the deck is more than 7 feet from a sprinkler head.

(b) *Pipe sizes.* (1) The sizes of branch lines, single cross mains, feed mains, and risers shall be in proportion to the number of sprinkler heads served. The minimum pipe sizes shall be as given in Table 76.25–10 (b) (1).

TABLE 76.25–10 (b) (1)

Minimum nominal pipe size, inches	Maximum number of heads served	
	Vessels whose construction is more combustible than that set forth in §§ 72.05–5 through 72.05–60	Vessels constructed in general agreement with §§ 72.05–5 through 72.05–60
1	2	2
1¼	3	3
1½	5	5
2	10	10
2½	20	40
3	40	250
3½	65	----------
4	100	----------
5	180	----------
6	250	----------

(2) If a complete loop cross main is employed, the size of such cross main shall be in proportion to the number of sprinkler heads served. The minimum pipe sizes shall be as given in Table 76.25–10 (b) (2). The entire loop shall be of the same size pipe.

TABLE 76.25–10 (b) (2)

Minimum nominal pipe size inches	Maximum number of heads served	
	Vessels whose construction is more combustible than that set forth in §§ 72.05–5 through 72.05–60	Vessels constructed in general agreement with §§ 72.05–5 through 72.05–60
1	5	5
1¼	9	9
1½	13	13
2	22	30
2½	40	80
3	80	250
3½	130	----------
4	250	----------

§ 76.25–15 Pumps and water supply.

(a) An automatically controlled pump shall be provided to supply the sprinkling system and shall be used for no other purpose. The size and capacity of the pump shall be governed by the zone having the greatest capacity need for any one deck, and shall be suitable to operate at least the number of heads noted in Table 76.25–15 (a) with a Pitot tube pressure of at least 15 p. s. i. at all heads (approximately 20 GPM per head). There shall also be sufficient pumping capacity available, either from the automatic pump, the fire pumps, or other source, so that in conjunction with the automatic pump the total number of heads noted in Table 76.25–15 (a) may be operated with the same efficiency as noted above, and at the same time to deliver water from the two highest fire hose outlets in a manner similar to that described in § 76.10–5 (c). Intermediate values may be obtained by interpolation.

TABLE 76.25–15 (a)

Maximum number of heads on one deck in one zone	Number of heads automatic pump to supply	Number of heads additional pumps to supply
5	5	----------
10	10	----------
20	10	10
30	12	16
40	15	18
50	15	25
60	20	25
80	20	30
100	20	40
120	20	50
150	20	60
200	20	75
250	20	100

§ 76.25–20 Pressure tank.

(a) A pressure tank or other suitable means shall be installed to permit early action of the system pending the starting of the pump. Sufficient fresh water shall be carried in the tank to fill the piping of the largest zone, and in addition, force out at least 200 gallons at the least effective head in the zone at a Pitot tube pressure of at least 15 p.s.i. Suitable check valves shall be installed to prevent salt water from entering the pressure tank, and low water and low pressure alarms shall be fitted.

§ 76.25–25 Controls.

(a) The controls for the system shall be outside the spaces protected, and shall not be located in such space as might be cut off or made inaccessible in the event of fire in any of the spaces protected. The control space shall be marked as required by § 78.47–17 of this subchapter.

(b) Each supply line to the various zones shall be fitted with a stop valve which shall be marked as required by § 78.47–15 of this subchapter. These valves shall be normally open, and shall indicate by an alarm if they are closed.

§ 76.25–30 Piping.

(a) All piping, valves, and fittings of ferrous materials shall be protected in-

side and outside against corrosion unless specifically approved by the Commandant.

(b) All piping, valves, fittings, and sprinkler heads shall be securely supported, and, where necessary, protected against injury.

(c) Drains and dirt traps shall be fitted where necessary to prevent the accumulation of dirt or moisture.

(d) Piping shall be used for no other purpose.

§ 76.25–35 Operation and installation.

(a) The system shall be so arranged and installed that a fire in any of the protected spaces will open the affected sprinkler heads. Water from the pressure tank shall be immediately available to the affected sprinkler head and before the supply from the pressure tank is exhausted, the sprinkler pump shall be automatically started and shall supply the system until manually shut off. Suitable test stations shall be installed in each zone to test the operation of the system.

(b) The system shall be so arranged and installed that the presence of a fire in any of the protected spaces will automatically be registered visibly and audibly in the pilothouse or fire control station. The visible notice shall automatically indicate the zone in which the alarm originated. On vessels over 150 feet in length, there shall also be an audible alarm in the engine room.

(c) There shall be not less than two sources of power supply for the sea water pumps, air compressors and automatic alarms. Where the sources of power are electrical, these shall be a main generator and an emergency source of power. One supply shall be taken from the main switchboard, by separate feeders reserved solely for that purpose. Such feeders shall be run to a change-over switch situated near to the sprinkler unit and the switch shall normally be kept closed to the feeder from the emergency switchboard. The change-over switch shall be clearly labeled and no other switch shall be permitted in these feeders.

(d) Where subject to freezing, sprinkler systems shall be of the dry pipe type.

(e) The sprinkler heads, the cabinet, alarms, dry valves and actuating mechanisms shall be of an approved type.

(f) In general, the sprinkler heads shall be rated not lower than 135 degrees F. nor higher than 165 degrees F. However, in spaces where a high ambient temperature may be expected, sprinkler heads rated at 212 degrees F. shall be used.

(g) The automatic sprinkling system and all its components shall be used for no other purpose.

(h) All wiring and electrical circuits and equipment shall meet the applicable requirements of Subchapter J (Electrical Engineering) of this chapter.

(i) All piping, valves, fittings, pressure tanks, etc., shall meet the applicable requirements of Subchapter F (Marine Engineering) of this chapter.

(j) A framed chart or diagram shall be installed in the wheelhouse or control station adjacent to the detecting cabinet indicating the location of the various detecting zones and giving instructions for the operation, maintenance, and testing of the system. This chart, or a separate card or booklet to be kept near the chart, shall have tabulated spaces for the date and signature of the licensed officer of the vessel who shall witness or conduct the periodic tests.

(k) The audible alarms shall be identified as required by § 78.47–13 of this subchapter.

§ 76.25–90 Installations contracted for prior to November 19, 1952.

(a) Installations contracted for prior to November 19, 1952, shall meet the following requirements:

(1) Existing arrangements, materials, and facilities previously approved shall be considered satisfactory so long as they meet the minimum requirements of this paragraph, and they are maintained in good condition to the satisfaction of the Officer in Charge, Marine Inspection. Minor repairs and replacements may be made to the same standards as the original installation.

(2) The details of the system shall be in general agreement with §§ 76.25–5 through 76.25–35 insofar as is reasonable and practicable. Existing piping, pumping facilities, sprinkler heads, and operating devices may be retained provided a reasonable coverage of the spaces protected is assured.

Subpart 76.27—Electric Fire Detecting System, Details

§ 76.27–1 Application.

(a) Where an electric fire detecting system is installed, the provisions of this subpart, with the exception of § 76.27–90, shall apply to all installations contracted for on or after November 19, 1952. Installations contracted for prior to November 19, 1952, shall meet the requirements of § 76.27–90.

§ 76.27–5 Zoning.

(a) The fire detecting system shall be divided into separate zones to restrict the area covered by any particular alarm signal.

(b) All spaces in a fire detecting zone shall be accessible from one to another without leaving the deck involved. All doors in watertight subdivision bulkheads and main vertical zone bulkheads shall be assumed closed for the purpose of this requirement.

(c) The fire detecting zone shall not include spaces on more than one deck, except:

(1) Adjacent and communicating spaces on different decks in the ends of the vessel having a combined ceiling area of not more than 3,000 square feet.

(2) Isolated rooms or lockers in such spaces as mast houses, wheelhouse top, etc., which are easily communicable with the area of the fire-detecting circuit to which they are connected.

(3) Systems with indicators for individual spaces.

(d) The fire detecting zone shall not contain more than 50 protected rooms or spaces.

§ 76.27–10 Location and spacing of detectors.

(a) The detectors shall be located close to the overhead in the space protected. Where liable to physical damage, the detector shall be suitably protected.

(b) Unless specifically approved otherwise, no spot on the overhead of a protected space shall be more than 10 feet from a detector. Where beams or girders extend below the ceiling, or where the ceiling is installed at more than one level, the detectors shall be so located as to be most effective.

§ 76.27–15 Operation and installation.

(a) The system shall be so arranged and installed that the presence of a fire in any of the protected spaces will be automatically registered visibly and audibly in the pilothouse or fire control station. The visible notice shall indicate the zone in which the alarm originated. On vessels over 150 feet in length, there shall also be an audible alarm in the engine room.

(b) The detectors, the detecting cabinet and alarms shall be of an approved type.

(c) In general, the detectors, shall be rated not lower than 135 degrees F. and not higher than 165 degrees F. However, in spaces where a high ambient temperature may be expected, detectors shall be rated not lower than 175 degrees F. and not higher than 225 degrees F.

(d) The fire detecting system shall be used for no other purpose, except that it may be incorporated with the manual alarm system.

(e) All wiring and electrical circuits and equipment shall meet the applicable requirements of Subchapter J (Electrical Engineering) of this chapter.

(f) A framed chart or diagram shall be installed in the wheelhouse or control station adjacent to the detecting cabinet indicating the location of the various detecting zones and giving instructions for the operation, maintenance, and testing of the system. This chart, or a separate card or booklet to be kept near the chart, shall have tabulated spaces for the date and signature of the licensed officer of the vessel who shall witness or conduct the periodic tests.

(g) The audible alarms shall be identified as required by § 78.47–13 of this subchapter.

§ 76.27–90 Installations contracted for prior to November 19, 1952.

(a) Installations contracted for prior to November 19, 1952, shall meet the following requirements:

(1) Existing arrangements, materials, and equipment previously approved shall be considered satisfactory so long as they meet the minimum requirements of this paragraph, and they are maintained in good condition to the satisfaction of the Officer in Charge, Marine

Inspection. Minor repairs and alterations may be made to the same standards as the original installation.

(2) The details of the systems shall be in general agreement with §§ 76.27–5 through 76.27–15 insofar as is reasonable and practicable.

Subpart 76.30—Pneumatic Fire Detecting System, Details

§ 76.30–1 Application.

(a) Where a pneumatic fire detecting system is installed, the provisions of this subpart, with the exception of § 76.30–90, shall apply to all installations contracted for on or after November 19, 1952. Installations contracted for prior to November 19, 1952, shall meet the requirements of § 76.30–90.

§ 76.30–5 Zoning.

(a) The fire detecting system shall be divided into separate zones to restrict the area covered by any particular alarm signal.

(b) All spaces in a fire detecting zone shall be accessible from one to another without leaving the deck involved. All doors in watertight subdivision bulkheads and main vertical zone bulkheads shall be assumed closed for the purpose of this requirement.

(c) The fire detecting zone shall not include spaces on more than one deck, except:

(1) Adjacent and communicating spaces on different decks in the ends of the vessel, having a combined deck area of not more than 3,000 feet.

(2) Isolated rooms or lockers in such spaces as mast houses, wheelhouse top, etc., which are easily communicable with the area of the fire-detecting circuit to which they are connected.

(d) The fire detecting zone shall not include more than 50 protected rooms or spaces.

(e) Individual tubing circuits shall not contain more than 1,000 feet of pneumatic tubing or its equivalent. However, more than one tubing circuit may be included in the same fire detecting zone.

§ 76.30–10 Location and spacing of tubing.

(a) The tubing shall be located on the overhead or within 12 inches of the overhead on the bulkheads. Where liable to physical damage, the tubing shall be suitably protected.

(b) In each enclosed space or separate room there shall be exposed at least 5 percent of the total length of tubing in that circuit, but in no case shall the amount be less than 25 feet.

(c) No spot on the overhead of a protected space shall be more than 12 feet from the nearest point of tubing. Where beams or girders extend below the ceiling, or where the ceiling is installed at more than one level, the tubing shall be so located as to be most effective.

§ 76.30–15 Operation and installation.

(a) The system shall be so arranged and installed that the presence of a fire in any of the protected spaces will automatically be registered visibly and audibly in the pilothouse or fire control station. The visible notice shall automatically indicate the zone in which the alarm originated. On vessels over 150 feet in length, there shall also be an audible alarm in the engine room.

(b) The tubing or detecting devices, pneumatic-electric converting units, detecting cabinets, and alarms shall be of an approved type.

(c) In general, the system shall be adjusted to operate at a temperature rise of approximately 40 degrees F. per minute at the center of the circuit.

(d) The fire detecting system shall be used for no other purpose except that it may be incorporated with the manual alarm system.

(e) All wiring and electrical circuits and equipment shall meet the applicable requirements of Subchapter J (Electrical Engineering) of this chapter.

(f) A framed chart or diagram shall be installed in the wheelhouse or control station adjacent to the detecting cabinet indicating the location of the various detecting zones and giving instructions for the operation, maintenance, and testing of the system. This chart, or a separate card or booklet to be kept near the chart, shall have tabulated spaces for the date and signature of the licensed officer of the vessel who shall witness or conduct the periodic tests.

(g) The audible alarms shall be identified as required by § 78.47–13 of this subchapter.

§ 76.30–90 Installations contracted for prior to November 19, 1952.

(a) Installations contracted for prior to November 19, 1952, shall meet the following requirements:

(1) Existing arrangements, materials, and equipment previously approved shall be considered satisfactory so long as they meet the minimum requirements of this paragraph and they are maintained in good condition to the satisfaction of the Officer in Charge, Marine Inspection. Minor repairs and alterations may be made to the same standards as the original installation.

(2) The details of the systems shall be in general agreement with §§ 76.30–5 through 76.30–15 insofar as is reasonable and practicable.

Subpart 76.33—Smoke Detecting System, Details

§ 76.33–1 Application.

(a) Where a smoke detecting system is installed, the provisions of this subpart, with the exception of § 76.33–90, shall apply to all installations contracted for on or after November 19, 1952. Installations contracted for prior to November 19, 1952, shall meet the requirements of § 76.33–90.

§ 76.33–5 Zoning.

(a) The smoke detecting system shall be divided into separate zones to restrict the area covered by any particular alarm signal.

(b) The smoke detecting zone shall not include spaces on more than one deck, except the small adjacent spaces mentioned in paragraph (c) of this section.

(c) Each separate space shall be considered as a zone, except that two or three small adjacent spaces having a combined volume not exceeding 5,000 cubic feet may be connected on the same zone.

(d) Where a space is of such size that one accumulator is not sufficient, not more than two accumulators may be combined in one zone.

§ 76.33–10 Location and spacing of accumulators.

(a) Smoke accumulators shall be located overhead in each compartment. Where liable to physical damage, the accumulators and piping shall be suitably protected.

(b) No spot on the overhead of a protected space shall be more than 40 feet from an accumulator.

(c) Accumulators shall not be located closer to the opening of a ventilator than three times the diameter or equivalent diameter of the opening.

§ 76.33–15 Piping.

(a) Individual pipes shall be not less than ¾-inch standard pipe size.

(b) All piping, valves, and fittings of ferrous materials shall be protected inside and outside against corrosion unless specifically approved otherwise by the Commandant.

(c) Where a smoke detecting system serves a space used alternately for liquid and dry cargo, a valve shall be installed between the tank and the detecting cabinet so that the line may be shut off when liquids are carried. When the smoke detecting system is combined with a fire extinguishing system, the operation of the valve shall not affect the operation of the fire extinguishing system.

(d) All piping, valves, and fittings shall be securely supported, and where necessary, protected against injury. The piping shall be installed with as easy bends as practicable, and shall be installed to grade to low points for drainage.

(e) Drains and dirt traps shall be fitted where necessary to prevent the accumulation of dirt or moisture.

§ 76.33–20 Operation and installation.

(a) The system shall be so arranged and installed that the presence of smoke in any of the protected spaces will automatically be indicated visually to an observer directly in front of the detecting cabinet. The visible notice shall automatically indicate the zone in which the smoke originated. The detecting cabinet shall normally be located in the pilothouse or fire control station. On vessels over 5,000 gross tons, there shall also be an automatic audible alarm in the wheelhouse together with an auxiliary audible alarm in the engine room.

(b) If the detecting cabinet is not located in the pilothouse or fire control station, it shall be located in convenient proximity to the valve control station of the extinguishing system. In this case, there shall be in the pilothouse or

fire control station automatic visual alarms, one for each zone in which an alarm may originate, as well as an automatic audible alarm. There shall also be an auxiliary audible alarm in the engine room. For installations contracted for on or after January 1, 1962, where detecting cabinets are not located in the pilothouse or an adjacent fire control station having direct access to the pilothouse, an efficient means of direct communication shall be provided between the pilothouse and the stations where the detecting cabinets are located.

(c) A sufficient quantity of exhaust from the detecting cabinet shall be discharged in the vicinity of the cabinet to permit the detection of fire by odor. A valve shall be installed in such space to direct the exhaust, if obnoxious, to the outside.

(d) The smoke detecting system shall be used for no other purpose except that it may be incorporated with the fire extinguishing system to the spaces covered by the smoke detecting system.

(e) The accumulators, detecting cabinet, interconnecting valves with the fire extinguishing system, alarms, and indicating devices shall be of an approved type.

(f) All wiring and electrical circuits and equipment shall meet the applicable requirements of Subchapter J (Electrical Engineering) of this chapter.

(g) A framed chart or diagram shall be installed adjacent to the detecting cabinet and auxiliary panel indicating the location of the various zones and giving instructions for the operation, maintenance, and testing of the system. The chart at the cabinet location or a separate card or booklet to be kept near the chart, shall have tabulated spaces for the date and signature of the licensed officer of the vessel who shall witness or conduct the periodic tests.

(h) The audible smoke detecting alarms shall be identified as required by § 78.47–13 of this subchapter.

§ 76.33–90 Installations contracted for prior to November 19, 1952.

(a) Installations contracted for prior to November 19, 1952, shall meet the following requirements:

(1) Existing arrangements, material, and equipment previously approved shall be considered satisfactory so long as they meet the minimum requirements of this paragraph and they are maintained in good condition to the satisfaction of the Officer in Charge, Marine Inspection. Minor repairs and alterations may be made to the same standards as the original installation.

(2) The details of the systems shall be in general agreement with §§ 76.33–5 through 76.33–15 insofar as is reasonable and practicable.

Subpart 76.35—Manual Alarm System, Details

§ 76.35–1 Application.

(a) Where a manual alarm system is installed, the provisions of this subpart, with the exception of § 76.35–90, shall apply to all installations contracted for on or after November 19, 1952. Installations contracted for prior to November 19, 1952, shall meet the requirements of § 76.35–90.

§ 76.35–5 Zoning.

(a) The zoning of the manual alarm system shall meet the same requirements as for the electric fire detecting system, § 76.27–5.

§ 76.35–10 Location and spacing of manual alarm boxes.

(a) There shall be at least one manual alarm box in each zone.

(b) Manual alarms shall be located in main passageways, stairway enclosures, public spaces, or similar locations where they will be readily available and easily seen in case of need.

(c) In general, a sufficient number of manual alarm boxes shall be employed that a person escaping from any space would find a manual alarm box convenient on his normal route of escape.

§ 76.35–15 Operation and installation.

(a) The system shall be so arranged and installed that the presence of a fire may be reported from any of the protected spaces and be automatically registered visibly and audibly in the pilothouse or fire control station. The visible notice shall indicate the zone in which the alarm originated. There shall also be an audible alarm in the engine room.

(b) The manual alarm boxes, cabinet, and alarms shall be of an approved type.

(c) The manual alarm system shall be used for no other purpose, except that it may be incorporated with the fire detecting system.

(d) All wiring and electrical circuits and equipment shall meet the applicable requirements of Subchapter J (Electrical Engineering) of this chapter.

(e) A framed chart or diagram shall be installed in the wheelhouse or control station adjacent to the detecting cabinet indicating the location of the various detecting zones and giving instructions for the operation, maintenance, and testing of the system. This chart, or a separate booklet to be kept near the chart, shall have tabulated spaces for the date and signature of the licensed officer of the vessel who shall witness or conduct the periodic tests.

(f) The manual alarm boxes and bells shall be identified as required by § 78.47–10 of this subchapter.

§ 76.35–90 Installations contracted for prior to November 19, 1952.

(a) Installations contracted for prior to November 19, 1952, shall meet the following requirements:

(1) Existing arrangements, materials, and equipment previously approved shall be considered satisfactory so long as they meet the minimum requirements of this paragraph, and they are maintained in good condition to the satisfaction of the Officer in Charge, Marine Inspection. Minor repairs and alterations may be made to the same standards as the original installation.

(2) The details of the systems shall be in general agreement with §§ 76.35–5 through 76.35–15 insofar as is reasonable and practicable.

Subpart 76.50—Hand Portable Fire Extinguishers and Semiportable Fire Extinguishing Systems, Arrangements, and Details

§ 76.50–1 Application.

(a) The provisions of this subpart, with the exception of § 76.50–90, shall apply to all vessels contracted for on or after November 19, 1952. Vessels contracted for prior to November 19, 1952, shall meet the requirements of § 76.50–90.

§ 76.50–5 Classification.

(a) Hand portable fire extinguishers and semiportable fire extinguishing systems shall be classified by a combination letter and number symbol, the letter indicating the type of fire which the unit could be expected to extinguish, and the number indicating the relative size of the unit.

(b) The types of fire will be designated as follows:

(1) "A" for fires in ordinary combustible materials where the quenching and cooling effects of quantities of water, or solutions containing large percentages of water, are of first importance.

(2) "B" for fires in flammable liquids, greases, etc., where a blanketing effect is essential.

(3) "C" for fires in electrical equipment where the use of nonconducting extinguishing agent is of first importance.

(c) The number designations for size will start with "I" for the smallest to "V" for the largest. Sizes I and II are considered hand portable fire extinguishers and sizes III, IV and V are considered semiportable fire extinguishing systems which shall be fitted with suitable hose and nozzle or other practicable means so that all portions of the space concerned may be covered. Examples of size graduations for some of the typical hand portable and semiportable fire extinguishing systems are set forth in Table 76.50–5 (c).

TABLE 76.50–5 (c)

Classification		Soda-acid and water, gallons	Foam, gallons	Carbon dioxide, pounds	Dry chemical, pounds
Type	Size				
A	II	2½	2½		
B	I		1¼	4	2
B	II		2½	15	10
B	III		12	35	20
B	IV		20	50	30
B	V		40	100	50
C	I			4	2
C	II			15	10

(d) All hand portable fire extinguishers and semiportable fire extinguishing systems shall have permanently attached thereto a metallic name plate giving the name of the item, the rated capacity in gallons, quarts, or pounds, the name and address of the person or firm for whom approved, and the identifying mark of the actual manufacturer.

(e) Vaporizing-liquid type fire extinguishers, containing carbon tetrachloride or chlorobromomethane or other toxic vaporizing liquids shall be removed from all vessels.

§ 76.50–10 Location.

(a) Approved hand portable fire extinguishers and semiportable fire extinguishing systems shall be installed in accordance with Table 76.50–10 (a). The location of the equipment shall be to the satisfaction of the Officer in Charge, Marine Inspection. Nothing in this paragraph shall be construed as limiting the Officer in Charge, Marine Inspection, from requiring such additional equipment as he deems necessary for the proper protection of the vessel.

(b) Semiportable fire extinguishing systems shall be located in the open so as to be readily seen.

(c) If hand portable fire extinguishers are not located in the open or behind glass so that they may be readily seen, they may be placed in enclosures together with the fire hose, provided such enclosures are marked as required by § 78.47–20 of this subchapter.

(d) Hand portable fire extinguishers and their stations shall be numbered in accordance with § 78.47–30 of this subchapter.

(e) Hand portable or semiportable extinguishers, which are required on their nameplates to be protected from freezing, shall not be located where freezing temperatures may be expected.

TABLE 76.50-10 (a)

Space	Hand portable fire extinguisher and semiportable fire extinguishing systems	
	Classification (see § 76.50–5)	Quantity and location
Safety areas [1]		
Wheelhouse or fire control room	A–II, B–II, C–II.	1 of each classification on vessels over 1,000 gross tons. (Not required in both spaces.) (Multiple classification may be recognized.)
Stairway and elevator enclosures		None required.
Communicating corridors	A–II	1 in each main corridor in each main vertical zone. (May be located in stairway enclosures.)
Lifeboat embarkation and lowering stations		None required.
Radio room	C–I [2]	2 in vicinity of exit.[3]
Accommodations [1]		
Staterooms, toilet spaces, isolated pantries, etc.		None required.
Offices, lockers, and isolated storerooms		Do.
Public spaces	A–II	1 for each 2,500 square feet or fraction thereof located in vicinity of exits, except that none required for spaces under 500 square feet.
Open decks or enclosed promenades		None required.
Service spaces		
Galleys	B–II or C–II.	1 for each 2,500 square feet or fraction thereof suitable for hazards involved.
Main pantries	A–II	1 for each 2,500 square feet or fraction thereof located in vicinity of exits.
Motion picture booths and film lockers	C–I [2]	1 outside in vicinity of exit.
Paint and lamp rooms	B–II	1 outside space in vicinity of exit.
Inaccessible baggage, mail, and specie rooms, and storerooms.		None required.
Accessible baggage, mail, and specie rooms, and storerooms.	A–II	1 for each 2,500 square feet or fraction thereof located in vicinity of exits, either inside or outside the spaces.
Refrigerated storerooms	A–II	1 for each 2,500 square feet or fraction thereof located in vicinity of exits, outside the spaces.
Carpenter, valet, photographic, printing shops sales rooms, etc.	A–II	1 outside the space in vicinity of exit.
Machinery spaces		
Coal Fired Boilers: Bunker and boilerspace		None required.
Oil Fired Boilers: Spaces, containing oil fired boilers, either main or auxiliary, or their fuel oil units.	B–II B–V	2 required.[3] 1 required.[4]
Internal combustion or gas turbine propelling machinery spaces.	B–II B–III	1 for each 1,000 B. H. P., but not less than 2 or more than 6. 1 required.[5]
Electric propulsive motors or generators of open type.	C–II	1 for each propulsion motor or generator unit.
Enclosed ventilating systems for motors and generators of electric propelling machinery.		None required.
Auxiliary spaces, internal combustion or gas turbine.	B–II	1 outside the space in vicinity of exit.
Auxiliary spaces, electric emergency motors or generators.	C–II	Do.
Auxiliary spaces, steam		None required.
Trunks to machinery spaces		Do.
Fuel tanks		Do.
Cargo spaces		
Inaccessible during voyage, including trunks (excluding tanks).		Do.
Accessible during voyage	A–II	1 for each 1,200 square feet or fraction thereof.
Vehicular spaces (covered by sprinkler system).	B–II	1, plus 1 for each 6,000 square feet or fraction thereof.
Vehicular spaces (not covered by sprinkler system).	B–II	1, plus 1 for each 1,500 square feet or fraction thereof.[7]
Cargo oil tanks		None required.

[1] In any case, on vessels of 150 feet in length, and over, there shall be at least 2 A–II units on each passenger deck.
[2] For vessels on an international voyage, substitute 1 C–II in vicinity of exit.
[3] Vessels of less than 1,000 gross tons and not on an international voyage, require 1.
[4] Vessels of less than 1,000 gross tons and not on an international voyage may substitute 1 B–IV.
[5] If oil burning donkey boiler fitted in space, the B–V previously required for the protection of the boilerroom may be substituted. Not required on vessels of less than 300 gross tons if fuel has flashpoint of 110° F. or lower except those on an international voyage.
[6] Not required on vessels of less than 300 gross tons if fuel has flash point higher than 110° F.
[7] 2 B–I units may be substituted for 1 B–II unit.

§ 76.50–15 Spare charges.

(a) Spare charges shall be carried on all vessels for at least 50 percent of each size and each variety, i.e., foam, soda-acid, carbon dioxide, etc., of hand portable fire extinguisher required by § 76.50–10(a). However, if the unit is of such variety that it cannot be readily recharged by the vessel's personnel, one spare unit of the same classification shall be carried in lieu of spare charges for all such units of the same size and variety.

(b) Spare charges shall be so packaged as to minimize the hazards to personnel while recharging the units. Acid shall be contained in a Crown stopper type of bottle.

§ 76.50–90 Vessels contracted for prior to November 19, 1952.

(a) Vessels contracted for prior to November 19, 1952, shall meet the following requirements:

(1) The provisions of §§ 76.50–5 through 76.50–15 shall be met with the exception that existing installations in safety areas, accommodations, service spaces, and cargo spaces may be maintained if in the opinion of the Officer in Charge, Marine Inspection, they are in general agreement with the standard of safety prescribed by Table 76.50–10 (a). In such cases, minor modifications may be made to the same standards as the original installation, provided that in no case will a greater departure from the standards of Table 76.50–10(a) be permitted than presently exists.

Subpart 76.60—Fire Axes

§ 76.60–1 Application.

(a) The provisions of this subpart shall apply to all vessels.

§ 76.60–5 Number required.

(a) All vessels except barges shall carry at least the minimum number of fire axes as set forth in Table 76.60–5(a). Nothing in this paragraph shall be construed as limiting the Officer in Charge, Marine Inspection, from requiring such additional fire axes as he deems necessary for the proper protection of the vessel.

TABLE 76.60-5 (a)

Gross tons		Number of axes
Over	Not over	
---	50	1
50	200	2
200	500	4
500	1,000	6
1,000	---	8

(b) Covered barges shall carry at least three fire axes and uncovered barges shall carry at least two fire axes.

§ 76.60–10 Location.

(a) Fire axes shall be distributed throughout the spaces available to passengers and crew so as to be most readily available in the event of emergency.

(b) If fire axes are not located in the open or behind glass so that they may be

readily seen, they may be placed in enclosures together with the fire hose, provided such enclosures are marked as required by § 78.47–20 of this subchapter.

PART 77—VESSEL CONTROL AND MISCELLANEOUS SYSTEMS AND EQUIPMENT

Subpart 77.01—Application

Sec.
77.01–1 General.

Subpart 77.03—Marine Engineering Systems

77.03–1 Installation and details.

Subpart 77.05—Electrical Engineering and Interior Communication Systems

77.05–1 Installation and details.

Subpart 77.07—Anchors, Chains, and Hawsers

77.07–1 Application.
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77.07–10 Lakes, bays, and sounds, or river service.
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Subpart 77.13—Radiotelegraph and Radiotelephone

77.13–1 Required by Federal Communications Commission.

Subpart 77.15—Radio Direction Finder

77.15–1 Application.
77.15–5 Required by Federal Communications Commission.
77.15–90 Vessels contracted for prior to November 19, 1952.

Subpart 77.17—Navigation Lights and Shapes

77.17–1 When required.

Subpart 77.20—Whistles

77.20–1 Vessels other than sailing vessels and barges.

Subpart 77.23—Foghorns

77.23–1 When required.

Subpart 77.25—Fog Sound Signal Devices

77.25–1 When required.

Subpart 77.27—Sounding Equipment

77.27–1 When required.

Subpart 77.30—Emergency Equipment

77.30–1 Application.
77.30–5 General.
77.30–10 Stowage.
77.30–15 Spare charges.
77.30–90 Vessels contracted for prior to November 19, 1952.

Subpart 77.35—Fireman's Outfit

77.35–1 Application.
77.35–5 General.
77.35–10 Fireman's outfit.
77.35–15 Stowage.
77.35–20 Spare charges.
77.35–90 Vessels contracted for prior to May 26, 1965.

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Subpart 77.01—Application

§ 77.01–1 General.

(a) The provisions of this part shall apply to all vessels except as specifically noted.

Subpart 77.03—Marine Engineering Systems

§ 77.03–1 Installation and details.

(a) The installation of all systems of a marine engineering nature, together with the details of design, construction, and installation, shall be in accordance with the requirements of Subchapter F (Marine Engineering) of this chapter. Systems of this type include the following:

Steering systems.
Power for going astern.
Bilge and ballast systems.
Tank vent and sounding systems.
Overboard discharges and shell connections.
Pipe and pressure systems.

Subpart 77.05—Electrical Engineering and Interior Communication Systems

§ 77.05–1 Installation and details.

(a) The installation of all systems of an electrical engineering or interior communications nature, together with the details of design, construction, and installation, shall be in accordance with the requirements of Subchapter J (Electrical Engineering) of this chapter. Systems of this type include the following:

Ship's service lighting and power systems.
Emergency lighting and power systems.
General alarm systems.
Sound powered telephone and voice tube communication systems.
Engine order telegraph systems.
Rudder angle indicator systems.
Emergency loudspeaker systems.
Refrigerated spaces alarm systems.
Miscellaneous machine alarms and controls.
Daylight signaling lamps.

Subpart 77.07—Anchors, Chains, and Hawsers

§ 77.07–1 Application.

(a) The provisions of this subpart, with the exception of § 77.07–90, shall apply to all vessels contracted for on or after November 19, 1952. Vessels contracted for prior to November 19, 1952, shall meet the requirements of § 77.07–90.

§ 77.07–5 Ocean, coastwise, or Great Lakes service.

(a) Vessels in ocean, coastwise, or Great Lakes service shall be fitted with anchors, chains, and hawsers in general agreement with the standards established by the American Bureau of Shipping, see Subpart 70.35 of this subchapter.

§ 77.07–10 Lakes, bays, and sounds, or river service.

(a) Vessels in lakes, bays, and sounds, or river service shall be fitted with such ground tackle and hawsers as deemed necessary by the Officer in Charge, Marine Inspection, depending upon the size of the vessel and the waters on which it operates.

§ 77.07–90 Vessels contracted for prior to November 19, 1952.

(a) Vessels contracted for prior to November 19, 1952, shall meet the following requirements:

(1) Installations previously accepted or approved shall be considered satisfactory for the same service so long as they are maintained in good condition to the satisfaction of the Officer in Charge, Marine Inspection. If the service of the vessel is changed, the suitability of the equipment will be established by the Officer in Charge, Marine Inspection.

Subpart 77.13—Radiotelegraph and Radiotelephone

§ 77.13–1 Required by Federal Communications Commission.

(a) Radiotelegraph and radiotelephone installations are required on certain vessels. Details of the application of this requirement as well as details of the installation shall be as required by the statutes and regulations under the jurisdiction of the Federal Communications Commission.

Subpart 77.15—Radio Direction Finder

§ 77.15–1 Application.

(a) The provisions of this subpart, with the exception of § 77.15–90, shall apply to all mechanically propelled vessels of 1,600 gross tons and over in ocean service or on an international voyage contracted for on or after November 19, 1952. Such vessels contracted for prior to November 19, 1952, shall meet the requirements of § 77.15–90.

§ 77.15–5 Required by Federal Communications Commission.

(a) All vessels shall be fitted with a radio direction finder. Details of the installation shall be as required by the statutes and regulations under the jurisdiction of the Federal Communications Commission.

§ 77.15–90 Vessels contracted for prior to November 19, 1952.

(a) Vessels contracted for prior to November 19, 1952, shall meet the following requirements:

(1) Vessels of over 5,000 gross tons shall meet the requirements of § 77.15–5.

(2) Vessels of from 1,600 gross tons through 5,000 gross tons shall meet the requirements of § 77.15–5 on or before November 19, 1954.

Subpart 77.17—Navigation Lights and Shapes

§ 77.17–1 When required.

(a) All vessels shall be equipped with navigation lights and shapes as prescribed by law and regulation.

Subpart 77.20—Whistles

§ 77.20–1 Vessels other than sailing vessels and barges.

(a) All vessels other than sailing vessels and barges shall be equipped with an efficient whistle or similar appliance to give the necessary whistle signals required by the Rules of the Road applicable to the waters on which the vessel is navigated. The location of the whistle and operating devices shall be as follows:

(1) Means shall be provided to operate the whistle or other appliance from a position adjacent to the main steering station and from the steering station on top of the wheelhouse where such steering station is fitted. Details of the whistle operating device shall be as described in Subchapter J (Electrical Engineering) of this chapter.

(2) In general, the whistle shall be located on the forward side of or above the structure of the vessel so as to be as free of obstructions as possible. Where practicable, it shall be installed at least 6 feet above the wheelhouse, except that on vessels navigating the Western Rivers, and any vessel of less than 100 gross tons, it shall be at least 2 feet above the wheelhouse.

(3) On double ended ferry vessels and similar vessels, where steam whistles are employed, they shall be installed both forward and aft of the stacks or one such whistle on either the port or starboard side of the stack.

Subpart 77.23—Foghorns

§ 77.23–1 When required.

(a) Vessels shall be equipped with an efficient foghorn as prescribed by the Rules of the Road for the waters on which the vessel is navigated. On vessels in ocean or coastwise service, the fog horn shall be sounded by mechanical means.

Subpart 77.25—Fog Sound Signal Devices

§ 77.25–1 When required.

(a) All vessels shall be provided with an efficient fog bell at least 8 inches in diameter. The fog bell shall be located where the sound will be least obstructed.

(b) All vessels of more than 350 feet in length shall be provided with a fog gong which will produce a sound easily distinguishable from the sound of the bell required by paragraph (a) of this section and shall have a range of audibility approximating that of the bell. Vessels operating exclusively on the Great Lakes and the inland waters of the United States shall be exempt from this paragraph.

Subpart 77.27—Sounding Equipment

§ 77.27–1 When required.

(a) All mechanically propelled vessels in ocean or coastwise service of 500 gross tons and over, and all mechanically propelled vessels in Great Lakes service of 1,500 gross tons and over, except paddle wheel vessels, shall be fitted with an efficient mechanical or electronic deep-sea sounding apparatus in addition to the deep-sea hand leads. On Great Lakes vessels, a shallow water alarm may be substituted.

Subpart 77.30—Emergency Equipment

§ 77.30–1 Application.

(a) The provisions of this subpart, with the exception of § 77.30–90, shall apply to all vessels not on an international voyage contracted for on or after November 19, 1952. Such vessels contracted for prior to November 19, 1952, shall meet the requirements of § 77.30–90.

§ 77.30–5 General.

(a) All self-contained breathing apparatus and gas masks shall be of an approved type, constructed in accordance with Subpart 160.011 of Subchapter Q (Specifications) of this chapter.

(b) All gas masks, except the special refrigeration gas masks, shall be of the type approved by the Bureau of Mines as "Type N, Universal Gas Mask".

(c) All flame safety lamps shall be of an approved type, constructed in accordance with Subpart 160.016 of Subchapter Q (Specifications) of this chapter.

(d) All emergency equipment shall be maintained in an operative condition, and it shall be the responsibility of the master and chief engineer to ascertain that a sufficient number of the crew are familiar with the operation of the equipment.

§ 77.30–10 Stowage.

(a) The equipment set forth in Table 77.30–10 (a), together with such other items as the master may deem necessary, shall be stowed in convenient, accessible locations for use in case of emergency.

(b) The refrigeration gas masks shall be stowed convenient to, but outside of the spaces containing the refrigeration equipment.

(c) Half of the remaining equipment set forth in Table 77.30–10 (a) shall be stowed in or near the pilothouse together with a fire axe and the hand portable fire extinguishers required by Table 76.50–10 (a) for that location. The other half of the equipment shall be stowed in a convenient accessible location, remote from the pilothouse, and preferably adjacent to the main entrance to the machinery space. Where only one of an item is required, it shall be stowed in the pilothouse.

TABLE 77.30–10(a)

Service	Number of passenger staterooms	Self-contained breathing apparatus	Additional gas masks or self-contained breathing apparatus	Special refrigeration gas masks [1]	Flame safety lamps
Ocean and coastwise, not on an international voyage.	0 to 49			1	
	50 to 100	1	3	1	
	Over 100	1	5	1	1
Great Lakes, and lakes, bays, and sounds.	0 to 49			1	
	50 to 100	1	1	1	
	Over 100	1	3	1	1
Rivers	0 to 49			1	
	50 to 100	1		1	
	Over 100	1	1	1	1

[1] Required only on vessels equipped with refrigeration, small unit type refrigerators of not more than 20 cubic feet capacity excluded. A gas mask suitable for protection against each refrigerant used shall be provided.

§ 77.30–15 Spare charges.

(a) A complete recharge shall be carried for each gas mask and self-contained breathing apparatus. The spare charge shall be stowed in the same location as the equipment it is to reactivate.

§ 77.30–90 Vessels contracted for prior to November 19, 1952.

(a) Vessels contracted for prior to November 19, 1952, shall meet the following requirements:

(1) The requirements of §§ 77.30–5 through 77.30–15 shall be complied with insofar as the number of items of equipment and the method of stowage of the equipment is concerned. Existing items of equipment previously approved, but not meeting the applicable specifications set forth in § 77.30–5, may be continued in service so long as they are maintained in good condition to the satisfaction of the Officer in Charge, Marine Inspection, but all new installations or replacements shall meet the applicable specifications or requirements.

Subpart 77.35—Fireman's Outfit

§ 77.35–1 Application.

(a) The provisions of this subpart, with the exception of § 77.35–90, shall apply to all vessels on an international voyage contracted for on or after May 26, 1965. Such vessels contracted for prior to May 26, 1965, shall meet the requirements of § 77.35–90.

§ 77.35–5 General.

(a) All flame safety lamps shall be of an approved type, constructed in accordance with Subpart 160.016 of Subchapter Q (Specifications) of this chapter.

(b) All self-contained breathing apparatus shall be of an approved type, constructed in accordance with Subpart 160.011 of Subchapter Q (Specifications) of this chapter.

(c) All flashlights shall be of an approved 3-cell explosion-proof type, constructed in accordance with Subpart 161.008 of Subchapter Q (Specifications) of this chapter.

(d) All lifelines shall be of steel or bronze wire rope. Steel wire rope shall be either inherently corrosion resistant, or made so by galvanizing or tinning. Each end shall be fitted with a hook with keeper having throat opening which can be readily slipped over a $\frac{5}{8}$-inch bolt. The total length of the lifeline shall be dependent upon the size and arrangement of the vessel, and more than one line may be hooked together to achieve the necessary length. No individual length of lifeline may be less than 50 feet in length. The assembled lifeline shall have a minimum breaking strength of 1,500 pounds.

(e) All equipment shall be maintained in an operative condition, and it shall be the responsibility of the master and chief engineer to ascertain that a sufficient number of the crew are familiar with the operation of the equipment.

§ 77.35–10 Fireman's outfit.

(a) A fireman's outfit shall consist of one self-contained breathing apparatus with lifeline attached, one flashlight, one flame safety lamp, and one fire ax.

(b) The number of fireman's outfits required are as set forth in Table 77.-35–10(b).

TABLE 77.35-10(b)

Gross tonnage		Minimum number of fireman's outfits
Over—	Not over—	
	10,000	2
10,000	20,000	3
20,000		4

§ 77.35–15 Stowage.

(a) The fireman's outfit, together with such other items of equipment as the master may deem necessary, shall be stowed in convenient, accessible locations for use in case of emergency. One outfit shall be stowed in or near the pilothouse. Where additional outfits are required by Table 77.35–10(b), one of the additional outfits shall be stowed preferably adjacent to the main entrance to the machinery space. Other additional outfits shall be stowed in convenient accessible locations remote from the pilothouse.

§ 77.35–20 Spare charges.

(a) A complete recharge shall be carried for each self-contained breathing apparatus, and a complete set of spare batteries shall be carried for each flashlight. The spares shall be stowed in the same location as the equipment it is to reactivate.

§ 77.35–90 Vessels contracted for prior to May 26, 1965.

(a) Vessels contracted for prior to May 26, 1965, shall meet the following requirements:

(1) The requirements of §§ 77.35–5 through 77.35–20 shall be complied with insofar as the number of items of equipment and the method of stowage of the equipment is concerned. Existing items of equipment previously approved, but not meeting the applicable specifications set forth in § 77.35–5, may be continued in service so long as they are maintained in good condition to the satisfaction of the Officer in Charge, Marine Inspection, but all new installations or replacements shall meet the applicable specifications or requirements.

PART 78—OPERATIONS

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78.01–1 General.

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Subpart 78.25—Unauthorized Lights

78.25–1 Unauthorized lights prohibited.

Subpart 78.27—Searchlights

78.27–1 Improper use prohibited.

Subpart 78.30—Lookouts, Pilothouse Watch, Patrolmen, and Watchmen

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Subpart 78.49—Posting Placards of Instructions for Launching and Inflating Inflatable Liferafts

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Subpart 78.50—Markings on Vessels

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Subpart 78.85—Prevention of Oil Pollution

78.85-1 Prohibited zones.

AUTHORITY: The provisions of this Part 78 issued under R.S. 4405, as amended, 4462, as amended; 46 U.S.C. 375, 416. Interpret or apply R.S. 4417, as amended, 4418, as amended, 4426, as amended, 4453, as amended, sec. 10, 35 Stat. 428, as amended, 41 Stat. 305, as amended, secs. 1, 2, 49 Stat. 1544, 1545, as amended, sec. 3, 54 Stat. 347, as amended, sec. 3, 70 Stat. 152, sec. 3, 68 Stat. 675; 46 U.S.C. 391, 392, 404, 435, 395, 363, 367, 1333, 390b, 50 U.S.C. 198; E.O. 11239, July 31, 1965, 30 F.R. 9671, 3 CFR, 1965 Supp. Treasury Department Orders 120, July 31, 1950, 15 F.R. 6521; 167-14, Nov. 26, 1954, 19 F.R. 8026; 167-20, June 18, 1956, CGFR 56-28, July 24, 1956, 21 F.R. 5659, unless otherwise noted.

Subpart 78.01—Application

§ 78.01-1 General.

(a) The provisions of this part shall apply to all vessels except as specifically noted.

Subpart 78.03—Penalties

§ 78.03-1 General.

(a) The marine safety and criminal statutes provide penalties for the violation of the applicable provisions of this subchapter, which penalties, depending upon the gravity of the violation, are as follows:

(1) Assessment and collections of civil monetary penalty.

(2) Criminal prosecution where no loss of life results.

(3) Criminal prosecution for manslaughter where loss of life results from violation of statute or regulation or from misconduct, negligence, or inattention to duty.

(4) Libel against vessel.

(b) In addition to the foregoing, any licensed or certificated personnel committing an act of misbehavior, negligence, unskillfulness, endangering life, violation of marine safety statutes or regulations or requirements thereunder, and incompetency shall be subject to proceedings under the provisions of 46 U. S. C. 239 and regulations thereunder (46 CFR Part 137) with respect to suspension or revocation of license or certificate.

Subpart 78.05—Notice to Mariners and Aids to Navigation

§ 78.05-1 Duty of officers.

(a) Licensed deck officers are required to acquaint themselves with the latest information published by the Coast Guard and the United States Navy regarding aids to navigation. Neglect to do so is evidence of neglect of duty. It is desirable that all vessels have available in the pilothouse for convenient reference at all times a file of the applicable Notice to Mariners.

(1) Notice to Mariners, published weekly by the Coast Guard, contains announcements and information regarding aids to navigation and charts of waters of the United States and is available for free distribution at field offices of the Coast Guard, United States Coast and Geodetic Survey field stations, and the Marine Division, Customhouse.

(2) Notice to Mariners, published weekly by the United States Navy for the correction of charts, sailing directions, light lists, and other publications, and which includes foreign waters and certain waters of the United States, is available for free distribution at the Oceanographic Office, Branch Oceanographic offices, or any of the agencies at seaboard ports, and is also on file in the United States consulates where they may be inspected.

§ 78.05-5 Charts.

(a) All vessels, except barges, ferryboats, and vessels operating exclusively on rivers, shall have charts of the waters upon which they operate available for convenient reference at all times.

Subpart 78.07—Notice of Casualty and Voyage Records

AUTHORITY: The provisions of this Subpart 78.07 interpret or apply R.S. 4450, as amended, 4488, as amended, secs. 13, 17, 54 Stat. 166, as amended, sec. 10, 18 Stat. 128, as amended; 46 U.S.C. 239, 481, 526 l(c), 526p, 33 U.S.C. 361. Treasury Department Orders 167-32, September 23, 1958, 23 F.R. 7605; 167-38, October 26, 1959, 24 F.R. 8857.

§ 78.07-1 Notice of casualty.

(a) The owner, agent, master, or person in charge of a vessel involved in a marine casualty shall give notice as soon as possible to the nearest marine inspection office of the U.S. Coast Guard whenever the casualty results in any of the following:

(1) Damage to property in excess of $1,500.

(2) Material damage affecting the seaworthiness or efficiency of a vessel.

(3) Stranding or grounding.

(4) Loss of life.

(5) Injury causing any person to remain incapacitated for a period in excess of 72 hours; except injury to harbor workers not resulting in death and not resulting from vessel casualty or vessel equipment casualty.

(b) The master of any nuclear vessel shall immediately inform the Commandant in the event of any accident or casualty to the nuclear vessel which may lead to an environmental hazard. The master shall also immediately inform the competent governmental authority of the country in whose waters the vessel may be in, or whose waters the vessel approaches in a damaged condition.

§ 78.07-5 Information required.

(a) The notice required by § 78.07-1 shall show the name and official number of the vessel involved, the owner or agent thereof, the nature and probable occasion of the casualty, the locality in which it occurred, the nature and extent of injury to persons and the damage to property.

§ 78.07-10 Written report.

(a) In addition to the notice required by § 78.07-1, the person in charge of the vessel shall, as soon as possible, report in writing and in person to the Officer in Charge, Marine Inspection, at the port in which the casualty occurred or nearest the port of first arrival. However, if from a distance it may be inconvenient to report in person, it may be done in writing only. The written report required for personal accident shall be made on Form CG-924E and submitted for each individual injured and each loss of life. For all other vessel casualties the written report shall be made on Form CG-2692.

(b) If filed without delay, the Form CG-924E or CG-2692 may also provide the notice required by § 78.07-1.

§ 78.07-15 Retention of records.

(a) The owner, agent, master, or other person in charge of any vessel involved in a marine casualty shall retain such voyage records of the vessel as are maintained by the vessel, such as both rough and smooth deck and engine room logs, bell books, navigation charts, navigation work books, compass deviation cards, gyrocompass records, stowage plans, record of draft, aids to mariners, radiograms sent and received, the radio log and crew and passenger lists. The owner, agent, master, or other officer in charge, shall make these records available to a duly authorized Coast

Guard officer or employee for examination upon request.

§ 78.07–20 Aids to navigation.

(a) Whenever a vessel collides with a lightship, buoy, or other aid to navigation under the jurisdiction of the Coast Guard, or is connected with any such collision, it shall be the duty of the person in charge of such vessel to report the accident to the nearest Officer in Charge, Marine Inspection. No report on Form CG–2692 is required unless any of the results listed in § 78.07–1 (a) occur.

§ 78.07–25 Reports when state of war exists.

(a) During the period when a state of war exists between the United States and any foreign nation, communications in regard to casualties or accidents shall be handled with caution and the reports shall not be made by radio or by telegram.

Subpart 78.10—Persons Allowed in Pilothouse and on Navigation Bridge

§ 78.10–1 Persons excluded.

(a) Masters and pilots shall exclude from the pilothouse and navigator's bridge while under way, all persons not connected with the navigation of the vessel. However, inspectors of the Coast Guard, licensed officers of vessels, persons regularly engaged in learning the profession of pilot, officers of the Coast Guard, United States Navy, United States Coast and Geodetic Survey, and the Engineer Department of the United States Army or Maritime Administration personnel, may be allowed in the pilothouse or upon the navigator's bridge upon the responsibility of the officer in charge.

Subpart 78.13—Station Bills

AUTHORITY: The provisions of this Subpart 78.13 interpret or apply R.S. 4488, as amended, 46 U.S.C. 481. Treasury Department Order 167–38, October 26, 1959, 24 F.R. 8857.

§ 78.13–1 Master's responsibility.

(a) A station bill (muster list) shall be prepared by the master of the vessel who shall be responsible to sign such station bill and to ascertain that it is duly posted in conspicuous locations in the vessel, particularly in the crew quarters, before the vessel sails.

§ 78.13–5 Duties of crew.

(a) The station bill shall set forth the special duties and duty station of each member of the crew for the various emergencies. The duties shall, as far as possible, be comparable with the regular work of the individual. The duties shall in general include the following and, in addition, such other duties shall be assigned as are necessary in the case of the particular vessel for the proper handling of the particular emergency:

(1) The closing of airports, watertight doors, fire doors, scuppers, sanitary and other discharges which lead through the vessel's hull below the margin line, etc., the stopping of fans and ventilating systems, and the operation of all safety equipment.

(2) The preparation and launching of lifeboats, life rafts, and buoyant apparatus.

(3) The extinction of fire.

(4) The muster of passengers which shall in general be assigned to the stewards department, and shall include the following:

(i) Warning the passengers.

(ii) Seeing that they are dressed and have put on their life jackets in a proper manner.

(iii) Assembling the passengers and directing them to the appointed stations.

(iv) Keeping order in the passageways and stairways and generally controlling the movement of the passengers.

(v) Seeing that a supply of blankets is taken to the lifeboats.

(5) The custody of the portable radio apparatus required by Subpart 75.55 of this subchapter.

§ 78.13–10 Emergency signals.

(a) *Station bill.* (1) The station bill shall set forth the various signals to be used for the calling of the crew to their stations and for giving instructions while at their stations. These signals shall be as set forth in this section.

(b) *Fire alarm stations.* (1) The fire alarm signal shall be a continuous blast of the whistle for a period of not less than 10 seconds supplemented by the continuous ringing of the general alarm bells for not less than 10 seconds.

(2) For dismissal from fire alarm stations, the general alarm shall be sounded three times supplemented by three short blasts of the whistle.

(c) *Boat stations.* (1) The signal for boat stations or boat drill shall be a succession of more than six short blasts followed by one long blast of the whistle supplemented by a comparable signal on the general alarm bells.

(2) Where whistle signals are used for handling the lifeboats, they shall be as follows:

(i) To lower lifeboats, one short blast.

(ii) To stop lowering the lifeboats, two short blasts.

(3) For dismissal from boat stations, there shall be three short blasts of the whistle.

(d) *River vessels.* (1) In the case of river vessels, the ship's bell may be used in lieu of the whistle signals stipulated in this section.

(e) *Other emergency signals.* (1) The master of any vessel may establish such other emergency signals, in addition to the above, as will provide that all officers, crew, and passengers will have positive and certain notice of the existing emergency.

§ 78.13–15 Emergency squad.

(a) Where the size of the crew permits, the station bill shall include an emergency squad which shall be organized by the master to form the nucleus of the damage control party. This squad should be specially trained in the use of all emergency and rescue equipment and should be made generally familiar with the vessel and fundamentals of damage control.

(b) The nature of the signals or other means for assembling the emergency squad shall be left to the discretion of the master, but such signals shall not conflict with navigational or general alarm signals.

§ 78.13–20 Master to instruct crew.

(a) The master shall conduct such drills and give such instructions as are necessary to insure that all hands are familiar with their duties as specified in the station bill.

Subpart 78.14—Manning of Lifeboats and Liferafts

AUTHORITY: The provisions of this Subpart 78.14 interpret or apply R.S. 4488, as amended; 46 U.S.C. 481. Treasury Department Order 167–38, Oct. 26, 1959, 24 F.R. 8857.

§ 78.14–1 Application.

(a) The provisions of this subpart shall apply to all vessels.

§ 78.14–5 Person in command of lifeboat or liferaft.

(a) For vessels in ocean service, the master shall appoint a first and second in command of each lifeboat and each liferaft who shall be either a licensed deck officer, an able seaman, or a certificated lifeboatman.

(b) For vessels in services, other than ocean service, the master shall appoint a person in command of each lifeboat and each liferaft. Except for vessels in river service, this person shall be either a licensed deck officer, an able seaman or a certificated lifeboatman.

(c) The person in charge of each lifeboat or liferaft shall have a list of its crew, and shall see that the persons under his orders are acquainted with their several duties.

§ 78.14–10 Certificated lifeboatmen.

(a) Except for vessels in river service, there shall be for each lifeboat and each liferaft a number of certificated lifeboatmen equal to that specified in Table 78.14–10(a).

TABLE 78.14–10(a)

Prescribed complement of lifeboat or liferaft		Minimum number of lifeboatmen	
Over	Not over	Ocean service	All services other than ocean [1]
----------	25	2	1
25	40	2	2
40	60	3	3
60	85	4	4
75	110	5	5
110	----------	6	6

[1] Certificated lifeboatmen not required in river service.

(b) The allocation of the certificated lifeboatmen to each lifeboat and each liferaft shall be at the discretion of the master according to circumstances.

§ 78.14–15 Motor-propelled lifeboat.

(a) The master shall assign to each motor-propelled lifeboat a man capable of working the motor.

§ 78.14–20 Lifeboat carrying a wireless or searchlight.

(a) The master shall assign to each lifeboat carrying wireless and/or searchlight a man capable of operating such equipment.

Subpart 78.15—Doors Closed at Sea

§ 78.15–1 Subdivision bulkheads.

(a) All watertight doors in subdivision bulkheads shall be kept closed during navigation except when necessarily opened for working of the vessel, and in such cases they shall always be ready to be immediately closed.

Subpart 78.17—Tests, Drills, and Inspections

AUTHORITY: The provisions of this Subpart 78.17 interpret or apply R.S. 4488, as amended; 46 U.S.C. 481. Treasury Department Order 167–38, October 26, 1959, 24 F.R. 8857.

§ 78.17–1 Application.

(a) Except as specifically noted, the provisions of this subpart shall apply to all vessels.

§ 78.17–3 Watertight doors.

(a) It shall be the duty of the master to see that all watertight doors in subdivision bulkheads that may be opened at sea, and all mechanisms, remote controls, and indicators connected therewith, shall be periodically inspected at least once in each week that the vessel is navigated to be assured that they are in proper operating condition. On vessels in which the voyage exceeds one week in duration, these doors shall be operated before the vessel leaves port. All such doors shall be operated daily.

(b) The date of the test and the condition of the equipment shall be noted in the official log book.

§ 78.17–5 Valves and closing appliances.

(a) It shall be the duty of the master to see that all valves, including cross connecting valves where fitted, and other appliances such as port lights, closing mechanism of scuppers, ash chutes, and rubbish chutes, the closing of which is necessary to make a compartment watertight, are operated at least once in every week that the vessel is navigated to be assured that they are in proper operating condition. Any remote controls or indicating mechanisms shall be inspected at this time to test their efficiency. Where such valves are accessible, they shall be inspected at this time, otherwise, they shall be inspected at the first opportunity when they are accessible. On vessels in which the voyage exceeds one week in duration, these appliances shall be operated before the vessel leaves port.

(b) The date of the test and the condition of the equipment shall be noted in the official logbook.

§ 78.17–10 Loudspeaker system.

(a) Where fitted, the complete loudspeaker system shall be tested at least once every week. This test shall be made by an officer of the vessel.

(b) The date of the test and the condition of the equipment shall be noted in the official logbook.

CROSS REFERENCE: See § 113.50–35 of Subchapter J (Electrical Engineering) of this chapter for details.

§ 78.17–15 Steering gear, whistle, and means of communication.

(a) On all vessels making a voyage of more than 48 hours' duration, the entire steering gear, the whistle, and the means of communication between the bridge or pilothouse and the engine room shall be examined and tested by an officer of the vessel within a period of not more than 12 hours prior to departure. On all other vessels similar examinations and tests shall be made at least once every week.

(b) The date of the test and the condition of the equipment shall be noted in the official logbook.

§ 78.17–20 Drafts and load line markings.

(a) The master of every vessel on an ocean, coastwise, or Great Lakes voyage shall enter the drafts of the vessel, forward and aft, in the official logbook when leaving port.

(b) On vessels subject to the requirements of Subchapter E (Load Lines) of this chapter, at the time of departure from port on an ocean, coastwise, or Great Lakes voyage, the master shall insert in the official logbook a statement of the position of the subdivision load line mark, port and starboard, in relation to the surface of the water in which the vessel is then floating.

(1) When the draft of the vessel is limited by a seasonal load line located below the subdivision load line, the position of the applicable seasonal load line shall be entered in relation to the surface of the water in which the vessel is floating.

(2) When an allowance for draft is made for density of the water in which the vessel is floating, this density is to be noted in the official logbook.

§ 78.17–25 Sanitation.

(a) It shall be the duty of the master and chief engineer to see that the vessel and, in particular, the passenger and crew quarters are in a clean and sanitary condition. The chief engineer shall be responsible only for the sanitary condition of the engineering department.

§ 78.17–30 Examination of boilers and machinery.

(a) It shall be the duty of the chief engineer when he assumes charge of the boilers and machinery of a vessel to examine them thoroughly. If any parts thereof are in bad condition, or if the safety valve seals are broken, the fact shall immediately be reported to the master, owner or agent, and the Officer in Charge, Marine Inspection.

§ 78.17–35 Hatches and other openings.

(a) It shall be the responsibility of the master to assure himself before leaving protected waters that all exposed cargo hatches of his vessel are closed and made properly tight.

(b) The following doors, portable plates, ports, and other openings shall be kept closed while the vessel is being navigated, and shall be closed before the vessel commences a voyage:

(1) Watertight doors between cargo spaces as provided in § 73.35–17(b) of this subchapter.

(2) Portable plates in watertight bulkheads as provided in § 73.30–35 (a) of this subchapter.

(3) Gangway, cargo, and coaling ports fitted below the margin line.

(4) On ocean, coastwise, or Great Lakes vessels of 150 gross tons and over, all opening type port lights in a 'tween deck, if the sill of any port light in that 'tween deck, is below a line drawn parallel to the bulkhead deck at side and having its lowest point 4½ feet plus 2½ percent of the breadth of the vessel above the water when the vessel departs from port. The Commandant may indicate the limiting mean draft which would allow such port lights to be opened at sea.

(5) Port lights that are not accessible during navigation. Dead covers on such port lights shall also be secured.

(6) Port lights in spaces appropriated alternately to the carriage of cargo and passengers, when cargo is carried. Dead covers on such port lights shall also be secured.

(c) The time of opening and closing of hatches and other openings noted in this section shall be entered in the official logbook. In the event that the master at his discretion does not secure the hatches, a notation of this fact shall be made in the official logbook. If it becomes essential for the safety of the vessel to open any of the fittings noted in this section while at sea, the circumstances and the time of opening and closing shall be entered in the official logbook.

(d) The time of opening, closing, and securing, at sea, of watertight doors fitted between bunkers for the purpose of trimming coal, shall be entered in the official logbook.

§ 78.17–40 Line-throwing appliances.

(a) On vessels fitted with a line-throwing appliance, it shall be the duty of the master to drill his crew in the use of such appliance, and require it to be fired at least once in every 3 months. Each drill shall be recorded in the vessel's official logbook. The service line shall not be used for drill purposes. The drill shall be conducted as follows:

(1) For impulse-projected rocket type, by actually firing the rocket with any flexible line of proper size and length, suitably faked or laid out.

(2) For shoulder gun type, by actually firing, using the regular cartridge and projectile with any flexible line of proper size and length, suitably faked or laid out.

(3) For Lyle gun type, by actually firing, using 2½ ounces of powder, the regular service projectile with any flexible line of proper size and length suitably faked or laid out.

§ 78.17–45 Emergency lighting and power systems.

(a) It shall be the duty of the master to see that the emergency lighting and power systems are operated and inspected at least once in each week that the vessel is navigated to be assured that the system is in proper operating condition.

(b) Internal combustion engine driven emergency generators shall be operated under load for at least 2 hours, at least once in each month that the vessel is navigated.

(c) Storage batteries for emergency lighting and power systems shall be tested at least once in each 6-month period that the vessel is navigated to demonstrate the ability of the storage battery to supply the emergency loads for the specified period of time.

(d) The date of the tests and the condition and performance of the apparatus shall be noted in the official logbook.

§ 78.17–50 Fire and boat drills.

(a) The master shall be responsible for conducting a fire and boat drill at least once in every week. In the case of a vessel where the duration of the voyage exceeds 1 week, a fire and boat drill shall be held before the vessel leaves port and at least once a week thereafter. On all vessels on an international voyage other than a short international voyage, a muster of the passengers for fire and boat drill shall be held within 24 hours after leaving port.

(b) The fire and boat drill shall be conducted as if an actual emergency existed. All hands should report to their respective stations and be prepared to perform the duties specified in the station bill.

(1) Fire pumps shall be started and a sufficient number of outlets used to ascertain that the system is in proper working order.

(2) All rescue and safety equipment shall be brought from the emergency equipment lockers and the persons designated shall demonstrate their ability to use the equipment.

(3) All watertight doors which are in use while the vessel is under way and all fire doors shall be operated.

(4) Weather permitting, lifeboat covers and strongbacks shall be removed, plugs or caps put in place, boat ladders secured in position, painters led forward and tended, and other lifesaving equipment prepared for use. The motor and hand-propelling gear of each lifeboat, where fitted, shall be operated for at least 5 minutes.

(5) The passengers shall be encouraged to fully participate in these drills and shall be instructed in the use of the life preservers.

(6) In port, every lifeboat shall be swung out, if practicable, and the unobstructed lifeboats shall be lowered to the water and the crew exercised in the use of the oars and other means of propulsion if provided for the lifeboat. Although all lifeboats may not be used in a particular drill, care shall be taken that all lifeboats are given occasional use to ascertain that all lowering equipment is in proper order and the crew properly trained. The master shall be responsible that each lifeboat is lowered to the water at least once in each 3 months.

(7) When the vessel is under way, and weather permitting, all lifeboats shall be swung out to ascertain that the gear is in proper order.

(8) The person in charge of each lifeboat and liferaft shall have a list of its crew and shall see that the men under his command are acquainted with their duties.

(c) It shall be the duty of the master to ascertain that in connection with the fire and boat drills, or at other times, each member of the crew except female members has been drilled and exercised in pulling oars in lifeboats at least once in each 3 months. In addition, the crew of each motor-propelled lifeboat shall demonstrate their ability in the working of the engine and handling of the lifeboat under power, and the crew of each hand-propelled lifeboat shall demonstrate their ability in the operation of the hand-propelling gear and the operation of the lifeboat under hand power within the same time.

(d) An entry shall be made in the vessel's official logbook relative to each fire and boat drill setting forth the date and hour, length of time of the drill, numbers on the lifeboats swung out and numbers on those lowered, the length of time that motor and hand-propelled lifeboats are operated, the number of lengths of hose used, together with a statement as to the condition of all fire and lifesaving equipment, watertight door mechanisms, valves, etc. If in any week the required fire and boat drills are not held or only partial drills are held, an entry shall be made stating the circumstances and extent of the drills held.

(e) Three copies of certain sections from this part, Form CG–809, shall be framed under glass and posted in conspicuous places about the vessel. These forms may be obtained from the Officer in Charge, Marine Inspection.

§ 78.17–55 Electric power operated lifeboat winches.

(a) It shall be the duty of the master to see that all lifeboat winch control apparatus, including motor controllers, emergency switches, master switches, and limit switches, are examined at least once in each 3 months. The examination shall include the removal of drain plugs and/or the opening of drain valves in such appliances to assure that the enclosures are free of water.

(b) The date of the examinations required by this section and the condition of the equipment shall be noted in the official logbook.

§ 78.17–60 Lifeboats, liferafts, lifefloats, and buoyant apparatus.

(a) (1) It shall be the duty of the master or person in charge to see that the lifeboats, rescue boats, liferafts, lifefloats, and buoyant apparatus are properly maintained at all times, and that all equipment for his vessel required by the regulations in this subchapter is provided, maintained, and replaced as indicated.

(2) The master shall assign to one or more officers the duty of seeing that the lifeboats, rescue boats, liferafts, lifefloats, and buoyant apparatus are at all times ready for immediate use.

(3) The decks on which lifeboats, rescue boats, liferafts, lifefloats, and buoyant apparatus are stowed shall be kept clear of cargo or any other obstructions which would interfere with the immediate launching of such equipment.

(b) Where motor-propelled lifeboats are carried, the motor of each lifeboat shall be operated in the ahead and astern position for a period of not less than 5 minutes at least once in each week.

(c) All lifeboats, rescue boats and rigid type liferafts shall be stripped, cleaned, and thoroughly overhauled at least once in every year. When lifeboats are removed from a vessel for this purpose on a rotational basis, the installation test prescribed by Subpart 75.35 need not be made.

(d) The fuel tanks of all motor-propelled lifeboats shall be emptied and the fuel changed at least once in every year.

(e) All lifefloats and buoyant apparatus shall be cleaned and thoroughly overhauled at least once in every year.

(f) Inflatable liferafts shall be serviced at an approved service facility every 12 months or not later than the next vessel inspection for certification provided the time since date of last servicing does not exceed 15 months. Except in emergencies no servicing shall be done aboard vessels.

§ 78.17–65 Smoke detecting system.

(a) It shall be the duty of the master to see that the smoke inlets in cargo holds are examined at least once in each 3 months by the ship's personnel to determine if the inlets are obstructed by corrosion, paint, dust, or other extraneous matter. Smoke tests shall be made in all holds and the system found or made operable. The date of the test and condition of the system shall be entered in the log.

§ 78.17–70 Radio apparatus for lifeboats.

(a) It shall be the duty of the master to require that all batteries for all fixed and portable radio apparatus for lifeboats are brought up to full charge weekly if the batteries are of a type which require recharging.

(b) In any case, the transmitter shall be tested weekly using a suitable artificial aerial.

§ 78.17–75 Requirements for fuel oil.

(a) It shall be the duty of the chief engineer to cause an entry in the log be made of each supply of fuel oil received on board, stating the quantity received, the name of the vendor, the name of the oil producer, and the flashpoint (closed

cup test) for which it is certified by the producer.

(b) It shall be the further duty of the chief engineer to cause to be drawn and sealed and suitably labeled at the time the supply is received on board, a half-pint sample of each lot of fuel oil. These samples shall be preserved until the particular supply of oil is exhausted.

§ 78.17–80 Firefighting equipment, general.

(a) It shall be the duty of the owner, master, or person in charge to see that the vessel's firefighting equipment is at all times ready for use and that all such equipment required by the regulations in this subchapter is provided, maintained, and replaced as indicated.

(b) It shall be the duty of the owner, master, or person in charge to require and have performed at least once in every twelve months the tests and inspections of all hand portable fire extinguishers, semiportable fire extinguishing systems, and fixed fire extinguishing systems on board, as described in Tables 71.25–20 (a) (1) and 71.25–20 (a) (2) in § 71.25–20 of this subchapter. The owner, master, or person in charge shall keep records of such tests and inspections showing the dates when performed, the number and/or other identification of each unit tested and inspected, and the name(s) of the person(s) and/or company conducting the tests and inspections. Such records shall be made available to the inspector upon request and shall be kept for the period of validity of the vessel's current certificate of inspection. Where practicable these records should be kept in or with the vessel's log book. The conduct of these tests and inspections does not relieve the owner, master, or person in charge of his responsibility to maintain this firefighting equipment in proper condition at all times.

Subpart 78.20—Steering Orders

§ 78.20–1 Method of communicating.

(a) All steering orders shall be given and communicated in terms of "right rudder" where it is intended that the top of the wheel, the rudder blade, and the head of the ship should go to the right, and "left rudder" where it is intended that the top of the wheel, the rudder blade, and the head of the ship should go to the left.

Subpart 78.23—Whistling

§ 78.23–1 Unnecessary whistling prohibited.

(a) The unnecessary sounding of the vessel's whistle is prohibited within any harbor limits of the United States.

Subpart 78.25—Unauthorized Lights

§ 78.25–1 Unauthorized lights prohibited.

(a) The master shall not authorize or permit the carrying of any lights not required by law that in any way will interfere with the distinguishing of the signal lights.

Subpart 78.27—Searchlights

§ 78.27–1 Improper use prohibited.

(a) No person shall flash or cause to be flashed the rays of a searchlight or other blinding light onto the bridge or into the pilothouse of any vessel under way.

Subpart 78.30—Lookouts, Pilothouse Watch, Patrolmen, and Watchmen

AUTHORITY: The provisions of this Subpart 78.30 interpret or apply R.S. 4477, 4488, as amended; 46 U.S.C. 470, 481. Treasury Department Order 167–38, October 26, 1959, 24 F.R. 8857.

§ 78.30–5 Pilothouse watch.

(a) In addition to the licensed deck officer or pilot, there shall be at least one member of the crew also on watch in or near the pilothouse at all times when the vessel is being navigated.

§ 78.30–10 Supervised patrol.

(a) The provisions of this section shall apply to all vessels on an international voyage, and to all other vessels having berthed or stateroom accommodations for passengers. This section shall be applicable at all times when passengers are on board.

(b) Between the hours of 10 p. m. and 6 a. m., a supervised patrol shall be maintained so as to completely cover all parts of the vessel accessible to passengers or crew, excepting occupied sleeping accommodations and machinery spaces and similar spaces where a regular watch is maintained.

(c) Clocks, keys, and recording apparatus shall be of an approved type. The station boxes shall have seals placed over the securing screws in order to leave evidence of removal or tampering.

(d) Clocks or key stations shall be so arranged throughout the vessel so as to assure complete coverage of all accessible spaces required by paragraph (b) of this section. The number and location of recording stations, the order in which they are visited, and the number undertaken by one patrolman shall be specifically approved. The stations shall be numbered as required by § 78.47–23. Sufficient watchmen shall be available so that each space will be covered at least once in every hour except as follows:

(1) On existing vessels not constructed in general agreement with §§ 72.05–5 through 72.05–60, of this subchapter, the supervised patrol shall cover all spaces required by paragraph (b) of this section at least once in every 20 minutes.

(2) Public spaces constructed in general agreement with §§ 72.05–5 through 72.05–60, of this subchapter, shall have either an approved fire detecting system installed in such spaces or the supervised patrol shall cover these spaces at least once in every 20 minutes.

(e) The patrolman shall report to the bridge at least once an hour on vessels where the supervised patrol system is not equipped with a recording apparatus in the control station. In vessels requiring more than one patrol route, one patrolman may contact others and make a joint report to the bridge. Failure of a patrolman to follow a prescribed route, or to record each station within the specified time, shall be entered on the record along with the reason for the irregularity.

(f) The patrolman while on duty shall wear a distinctive uniform or badge, and shall have in his possession at all times an efficient flashlight.

(g) A patrolman on duty shall have no other tasks assigned to him.

§ 78.30–15 Watchmen.

(a) The provisions of this section shall apply to all vessels not required to have a supervised patrol under the provisions of § 78.30–10. This section shall be applicable at all times when passengers are on board.

(b) During the nighttime, a suitable number of watchmen shall be stationed in the passenger accommodation areas on each deck.

(c) Watchmen shall be under the direct charge of the master or officer in command of the vessel, and shall report to such officer at the pilothouse at fixed intervals not exceeding one hour. Watchmen shall not be required to perform any other duties while on watch.

(d) The uniform of the night watchman shall be conspicuously different from other persons so as to be readily distinguished. A rating badge marked "Watchman" shall be worn on the left sleeve and the front of the cap shall also be marked "Watchman".

(e) The watchman shall have in his possession at all times while on duty an efficient flashlight.

§ 78.30–20 Master's and officer's responsibility.

(a) Nothing in this part shall exonerate any master or officer in command from the consequences of any neglect to keep a proper lookout or to maintain a proper fire watch or from any neglect of any precaution which may be required by the ordinary practice of seamen or by the special circumstances of the case. When circumstances require it, additional watches shall be maintained to guard against fire or other danger and to give an alarm in case of accident or disaster.

§ 78.30–30 Reckless or negligent operation prohibited by law.

(a) Subsection 13(a) of the Act of April 25, 1940 (46 U.S.C. 526*l*), reads as follows:

> No person shall operate any motorboat or any vessel in a reckless or negligent manner so as to endanger the life, limb, or property of any person. To "operate" means to navigate or otherwise use a motorboat or a vessel.

Subpart 78.33—Reports of Accidents, Repairs, and Unsafe Equipment

AUTHORITY: The provisions of this Subpart 78.33 interpret or apply R.S. 4450, as amended, 4453, as amended, sec. 10, 18 Stat. 128, as amended; 46 U.S.C. 239, 435, 33 U.S.C. 361.

§ 78.33–1 Repairs of boiler and pressure vessels.

(a) Before making any repairs to boilers or unfired pressure vessels, the chief engineer shall submit a report covering the nature of the repairs to the Officer in Charge, Marine Inspection, at or nearest the port where the repairs are to be made.

§ 78.33–5 Accidents to machinery.

(a) In the event of an accident to a boiler, unfired pressure vessel, or machinery tending to render the further use of the item unsafe until repairs are made, or if by ordinary wear such items become unsafe, a report shall be made by the chief engineer immediately to the Officer in Charge, Marine Inspection, or if at sea, immediately upon arrival at port.

§ 78.33–10 Notice required before repairs.

(a) No repairs or alterations, except in an emergency, shall be made to any lifesaving or fire detecting or extinguishing equipment without advance notice to the Officer in Charge, Marine Inspection. When emergency repairs or alterations have been made, notice shall be given to the Officer in Charge, Marine Inspection, as soon as practicable.

§ 78.33–20 Breaking of safety valve seal.

(a) If at any time it is necessary to break the seal on a safety valve for any purpose, the chief engineer shall advise the Officer in Charge, Marine Inspection, at the next port of call, giving the reason for breaking the seal and requesting that the valve be examined and adjusted by an inspector.

(R.S. 4419, as amended; 46 U.S.C. 393)

Subpart 78.35—Cable Traveler

§ 78.35–1 When required.

(a) On vessels where the distance between deck houses is more than 150 feet, a wire cable shall be stretched between the deck houses at all times when the vessel is navigating in other than protected waters. As many loose rings with lanyards shall be attached as deemed necessary by the master. In any case, a properly constructed raised catwalk or raised bridge or a below deck passage may be substituted for the required cable.

(Interprets or applies R.S. 4488, as amended; 46 U.S.C. 481)

Subpart 78.36—Work Vests

AUTHORITY: The provisions of this Subpart 78.36 interpret or apply R.S. 4488, as amended, 4491, as amended, sec. 17, 54 Stat. 166; 46 U.S.C. 481, 489, 526p.

§ 78.36–1 Application.

(a) Provisions of this subpart shall apply to all vessels inspected and certificated in accordance with this subchapter.

§ 78.36–5 Approved unicellular plastic foam work vests.

(a) Buoyant work vests carried under the permissive authority of this subpart shall conform to the specifications contained in Subpart 160.053 in Subchapter Q (Specifications) of this chapter.

§ 78.36–10 Use.

(a) Approved buoyant work vests are considered to be items of safety apparel and may be carried aboard vessels to be worn by crew members when working near or over the water under favorable working conditions. They shall be used under the supervision and control of designated ship's officers. When carried, such vests shall not be accepted in lieu of any portion of the required number of approved life preservers and shall not be substituted for the approved life preservers required to be worn during drills and emergencies.

§ 78.36–15 Shipboard stowage.

(a) The approved buoyant work vests shall be stowed separately from the regular stowage of approved life preservers.

(b) The locations for the stowage of work vests shall be such as not to be easily confused with that for approved life preservers.

§ 78.36–20 Shipboard inspections.

(a) Each work vest shall be subject to examination by a marine inspector to determine its serviceability. If found to be satisfactory, it may be continued in service, but shall not be stamped by a marine inspector with a Coast Guard stamp. If a work vest is found not to be in a serviceable condition, then such work vest shall be removed from the vessel. If a work vest is beyond repair, it shall be destroyed or mutilated in the presence of a marine inspector so as to prevent its continued use as a work vest.

Subpart 78.37—Logbook Entries

§ 78.37–1 Application.

(a) Except as specifically noted, the provisions of this subpart shall apply to all vessels.

§ 78.37–3 Logbooks and records.

(a) Under various statutes or by regulations in this subchapter, vessels engaged in all trades, with the exception of vessels engaged exclusively in trade on rivers of the United States, shall have certain logbooks or records, and, when the occasion arises, it is the duty of the Master or person in charge to place therein specific entries as required by law or regulations in this subchapter.

(b) R.S. 4290, as amended (46 U.S.C. 201), states: "Every vessel making voyages from a port in the United States to any foreign port, or, being of the burden of 75 tons or upward, from a port on the Atlantic to a port on the Pacific, or vice versa, shall have an Official Logbook; * * *." This Official Logbook is furnished gratuitously to masters of United States' flag vessels by the Coast Guard, as Form CG–706B or CG–706C, depending upon the number of persons employed as crew. There is printed in the first several pages of this Official Logbook various acts of Congress relating to logbooks and the entries required to be made therein. When a voyage is completed, or after a specified period of time is completed, the Official Logbooks with required entries therein shall be filed with the Officer in Charge, Marine Inspection, at or nearest the port where the vessel may be.

(c) For vessels other than those required to have Official Logbooks by R.S. 4290, the owners, operators, and/or masters are to supply their own logs or records in any form desired, which will be considered to take the place of the Official Logbooks and may be used for the purpose of making entries therein as required by law or regulations in this subchapter. Such logs or records are not filed with the Officer in Charge, Marine Inspection, but shall be kept available for review by a marine inspector for a period of one year after the date to which the records refer.

§ 78.37–5 Actions required to be logged.

(a) The actions and observations noted in this section shall be entered in the official log book. This section contains no requirements which are not made in other portions of this subchapter, the items being merely grouped together for convenience.

(1) Fire and Boat Drills: Weekly. See § 78.17–50.

(2) Watertight door operation: Daily and Weekly. See § 78.17–3.

(3) Valve and closing appliance operation: Weekly. See § 78.17–5.

(4) Loudspeaker system: Weekly. See § 78.17–10.

(5) Steering gear, whistle, and means of communication: Prior to departure. See § 78.17–15.

(6) Drafts and load line markings: Prior to leaving port, ocean, coastwise, and Great Lakes services only. See § 78.17–20.

(7) Hatches and other openings: All openings and closings, or leaving port without closing, except vessels on protected waters. See § 78.17–35.

(8) Line throwing appliances: Once every 3 months. See § 78.17–40.

(9) Emergency lighting and power systems: Weekly and semiannually. See § 78.17–45.

(10) Electric power operated lifeboat winches: Once every 3 months. See § 78.17–55.

(11) Smoke Detecting System: Once every 3 months. See § 78.17–65.

(12) Fuel oil data: Upon receipt of fuel oil on board. See § 78.17–75.

(13) Cargo gear inspections: At least once a month. See § 71.47–70 of this subchapter.

§ 78.37–10 Official log entries.

(a) In addition to other items required to be entered in the official logbook on every vessel where an official logbook is required, all items relative to the crew and passengers, including the count of passengers carried, and to casualties shall also be entered.

(b) Except as noted in subparagraph (1) of this paragraph, on any vessel where an official logbook is not required, the master shall keep a record of the correct count of all the passengers received and delivered from day to day. This record shall be open to inspection

by the Coast Guard at all times. The aggregate number of the passengers carried shall be furnished to the Coast Guard whenever requested (R. S. 4467, as amended, 46 U. S. C. 460). The information shall be available for a period of one year after the date to which the records refer.

(1) The provisions of the paragraph shall not apply to ferry vessels.

Subpart 78.40—Vehicular Ferries

§ 78.40–1 Stowage of vehicles.

(a) Automobiles or other vehicles shall be stowed in such a manner as to permit both passengers and operators to get out and away from them freely in the event of fire or other disaster. Where there is insufficient clearance to provide for easy egress at all times, both passengers and operators shall be directed to leave their vehicles and to occupy other spaces reserved for them during the crossing. The decks, where necessary, shall be definitely marked with painted lines to indicate the vehicle runways and the aisle spaces.

§ 78.40–5 Securing of vehicles.

(a) The master shall take all necessary precautions to see that automobiles or other vehicles have their motors turned off when the ferry is under way, and the motors shall not be started until the ferry is secured to the landing. In addition, the vehicles at each end shall have their wheels securely blocked, while the vessel is being navigated.

§ 78.40–10 No smoking permitted.

(a) The master shall have appropriate "No Smoking" signs posted and shall take all necessary precautions to prevent smoking or carrying of lighted or smoldering cigars, cigarettes, etc., in the deck area assigned to automobiles or other vehicles.

Subpart 78.43—Railroad Passenger Car Ferries

§ 78.43–1 Precautions for railway passenger cars.

(a) It shall be the duty of the master of any railroad passenger car ferry to see that all of the doors of the cars are unlocked and that the vestibules of the cars are open while the cars are on the ferry, to allow the persons so carried free access at all times.

Subpart 78.45—Display of Plans

§ 78.45–1 When required.

(a) Vessels of 1,000 gross tons and over, and vessels of any tonnage on an international voyage shall have permanently exhibited for the guidance of the officer in charge of the vessel the following plans:

(1) General arrangement plans showing for each deck the fire control stations, the various sections enclosed by fire-resisting bulkheads, the sections enclosed by fire-retarding bulkheads, together with particulars of the fire alarms, detecting systems, the sprinkler installation (if any), the fire extinguishing appliances, means of access to different compartments, decks, etc., and the ventilating systems including particulars of the master fan controls, the positions of dampers, the location of the remote means of stopping the fans, and identification numbers of the ventilating fans serving each section. Alternatively, at the discretion of the Commandant, the aforementioned details may be set out in a booklet, a copy of which shall be supplied to each officer, and one copy at all times shall be available on board in an accessible position.

(2) Plans showing clearly for each deck and hold the boundaries of the watertight compartments, the openings therein with the means of closure and position of any controls thereof, and the arrangements for the correction of any list due to flooding.

(3) Plans and booklets shall be kept up-to-date, any alteration being recorded thereon as soon as practicable.

(R.S. 4488, as amended, sec. 5, 49 Stat. 1384, as amended; 46 U.S.C. 481, 369. Treasury Department Order 167-38, October 26, 1959, 24 F.R. 8857)

Subpart 78.47—Markings for Fire and Emergency Equipment, Etc.

AUTHORITY: The provisions of this Subpart 78.47 interpret or apply R.S. 4488, as amended; 46 U.S.C. 481. Treasury Department Order 167-38, Oct. 26, 1959, 24 F.R. 8857.

§ 78.47–1 Application.

(a) The provisions of this subpart with the exception of § 78.47–90, shall apply to all vessels contracted for on or after November 19, 1952. Vessels contracted for prior to November 19, 1952, shall meet the requirements of § 78.47–90.

§ 78.47–3 General.

(a) It is the intent of this subpart to provide such markings as are necessary for the guidance of the persons on board in case of emergency. In any specific case, and particularly on small vessels, where it can be shown to the satisfaction of the Officer in Charge, Marine Inspection, that the prescribed markings are unnecessary for the guidance of the persons on board in case of emergency, such markings may be modified or omitted.

(b) In addition to English, all stateroom notices, directional signs, etc., shall be printed in languages appropriate to the service of the vessel or other action be taken to achieve the same purpose.

(c) Where in this subpart red letters are specified, letters of a contrasting color on a red background will be accepted.

§ 78.47–5 General alarm bell switch.

(a) The general alarm bell switch in the pilothouse, and in the fire control station, if also located there, shall be clearly and permanently identified by lettering on a metal plate or with a sign in red letters on a suitable background: "GENERAL ALARM."

CROSS REFERENCE: See also § 113.25–20 of Subchapter J (Electrical Engineering) of this chapter.

§ 78.47–7 General alarm bells.

(a) All general alarm bells shall be identified by red lettering at least ½ inch high: "GENERAL ALARM—WHEN BELL RINGS GO TO YOUR STATION."

§ 78.47–9 Carbon dioxide alarm.

(a) All carbon dioxide alarms shall be conspicuously identified: "WHEN ALARM SOUNDS—VACATE AT ONCE. CARBON DIOXIDE BEING RELEASED."

§ 78.47–10 Manual alarm boxes.

(a) In all new installations, manual alarm boxes shall be clearly and permanently marked "IN CASE OF FIRE BREAK GLASS." Existing boxes not so marked with the same or equivalent wording, shall be identified either on the box or adjacent bulkhead in at least ½ inch letters "IN CASE OF FIRE BREAK GLASS." All manual alarm boxes shall be numbered in red on the adjacent bulkhead with at least ½ inch figures. The number shall agree with the number of the zone.

§ 78.47–13 Fire detecting and manual alarm, automatic sprinkler, and smoke detecting alarm bells.

(a) The fire detecting and manual alarm automatic sprinkler, and smoke detecting alarm bells in the engine room shall be identified by at least 1 inch red lettering "FIRE ALARM", "SPRINKLER ALARM" or "SMOKE DETECTING ALARM" as appropriate. Where such alarms on the bridge or in the fire control station do not form a part of an easily identifiable alarm cabinet, the bells shall be suitably identified as above.

§ 78.47–15 Fire extinguishing system branch lines.

(a) The branch line valves of all fire extinguishing systems shall be plainly and permanently marked indicating the spaces served.

§ 78.47–17 Fire extinguishing system controls.

(a) The control cabinets or spaces containing valves or manifolds for the various fire extinguishing systems shall be distinctly marked in conspicuous red letters at least 2 inches high—"STEAM FIRE APPARATUS", "CARBON DIOXIDE FIRE APPARATUS", "FOAM FIRE APPARATUS", "WATER SPRAY FIRE APPARATUS", "MANUAL SPRINKLING SYSTEM", or "AUTOMATIC SPRINKLING SYSTEM", as the case may be.

§ 78.47–20 Fire hose stations.

(a) Each fire hydrant shall be identified in red letters and figures at least 2 inches high "FIRE STATION NO 1," "2," "3," etc. Where the hose is not stowed in the open or behind glass so as to be readily seen, this identification shall be so placed as to be readily seen from a distance.

§ 78.47–23 Supervised patrol stations.

(a) Each supervised patrol clock or key station shall be numbered.

§ 78.47–25 Emergency squad equipment.

(a) Lockers or spaces containing equipment for the use of the emergency squad shall be marked "EMERGENCY SQUAD EQUIPMENT."

§ 78.47–27 Self-contained breathing apparatus and gas masks.

(a) Lockers or spaces containing self-contained breathing apparatus or gas masks shall be marked "SELF-CONTAINED BREATHING APPARATUS" or "GAS MASK."

§ 78.47–30 Hand portable fire extinguishers.

(a) Each hand portable fire extinguisher shall be marked with a number and the location where stowed shall be marked with a corresponding number at least ½ inch high. Where only one type and size of hand portable fire extinguisher is carried, the numbering may be omitted.

§ 78.47–33 Emergency lights.

(a) All emergency lights shall be marked with a letter "E" at least ½ inch high.

§ 78.47–35 Fire doors.

(a) All doors in main vertical zone bulkheads or stairway enclosures, except from individual rooms such as staterooms, fan rooms, lockers, etc., shall be numbered conspicuously on an etched plate or equivalent in not less than ⅜ inch letters and figures "F. S. D. 1," "2," "3," etc. If stenciled or similar notice is used, the letters and figures shall be at least 1 inch high. The number shall be conspicuous with the door in the open position.

§ 78.47–37 Watertight doors.

(a) All watertight doors in subdivision bulkheads shall be numbered conspicuously on both sides on an etched plate or equivalent in not less than ⅜ inch letters and figures "W. T. D. 1," "2," "3," etc. If a stencilled or similar notice is used, the letters and figures shall be at least 1 inch high. If the construction is such that the number cannot be seen with the door in the open position, a similar number shall be placed on the frame or other location immediately adjacent to the door. All watertight door remote control stations shall be marked in the same manner, and in addition, the direction of operation of the lever or wheel to open and close the door shall be conspicuously marked.

(b) Class 1 doors fitted in accordance with § 73.35–5(b) of this subchapter shall additionally be marked "RECLOSE AFTER USE."

§ 78.47–38 Valves and closing appliances.

(a) All valves and closing appliances, or other mechanisms which may be required to be operated for damage control purposes in case of emergency shall be conspicuously marked with letters at least 1 inch high identifying the control and the direction of operation. In all cases indication shall be provided to show whether the control is open or closed.

§ 78.47–40 Exit signs.

(a) Illuminated signs bearing the word "EXIT" in red letters shall be installed in such locations throughout the vessel that from any portion of the vessel normally accessible to the passengers or crew, except machinery spaces, and stores and similar spaces where the crew are not normally employed, so that, with all fire doors in stairway enclosures and main vertical zone bulkheads and all watertight doors closed, the direction of escape to the open deck will be apparent. For the purpose of this paragraph, individual staterooms and other similar small rooms will not be required to have such signs, but upon emerging from such rooms the direction of escape should be apparent. The power for the illuminated exit signs shall be from the emergency switchboard.

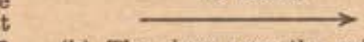
(b) Small rooms or spaces having a secondary means of escape which is not obviously apparent shall have a suitable sign in red letters "EMERGENCY EXIT" directing attention to such escape.

CROSS REFERENCE: See § 111.50–15(d) of Subchapter J (Electrical Engineering) of this chapter for minimum size.

§ 78.47–43 Embarkation direction signs to lifeboats.

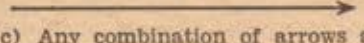
(a) Sufficient embarkation direction signs shall be installed in passageways, stairways, etc., throughout the vessel that from any portion of the vessel normally accessible to the passengers or crew, and with all fire doors in stairway enclosures and main vertical zone bulkheads and all closed watertight doors in subdivision bulkheads, the direction of the shortest route to follow to reach the lifeboats will be apparent. The signs shall be in at least 1 inch letters with arrows of appropriate dimensions:

TO BOATS



(b) The signs near the exits to the embarkation deck shall be similar to the above, and shall indicate the boat stations nearest to the exit:

TO BOAT STATIONS
NOS. 1, 3, 5
(or 2, 4, 6, etc.)



(c) Any combination of arrows and one inch lettering which will clearly indicate the direction to be followed will be acceptable.

§ 78.47–45 Lifeboat stations.

(a) There shall be placed on the deck beams or suspended athwartship from overhead at each lifeboat station on the embarkation deck a sign in three-inch letters "LIFEBOAT STATION NO. 1," "2," "3," etc. If there is insufficient head room or no overhead structure at a boat station, a similar sign shall be permanently installed where it will be readily seen.

§ 78.47–47 Stateroom notices.

(a) Framed notices shall be conspicuously posted in the passenger staterooms indicating the following which may be posted separately or together.

(1) Emergency signal:

EMERGENCY SIGNALS

FIRE AND EMERGENCY—CONTINUOUS RAPID RINGING OF THE SHIP'S BELL AND OF THE GENERAL ALARM BELLS FOR A PERIOD OF NOT LESS THAN 10 SECONDS.

ABANDON SHIP (OR BOAT STATIONS)—MORE THAN 6 SHORT BLASTS AND ONE LONG BLAST OF THE WHISTLE SUPPLEMENTED BY THE SAME SIGNAL ON THE GENERAL ALARM BELLS.

THE OCCUPANTS OF THIS ROOM ARE ASSIGNED TO LIFEBOAT NO. _____. ALL PASSENGERS ARE REQUIRED TO PUT ON LIFE PRESERVERS AND GO TO THEIR LIFEBOAT STATIONS WHENEVER GENERAL ALARM BELLS RING.

THE ROOM STEWARD WILL PROVIDE LIFE PRESERVERS FOR CHILDREN AT THE START OF THE VOYAGE.

(2) Life preservers: The location of life preservers together with instructions and pictures showing how they are worn shall be indicated in a framed notice.

§ 78.47–50 Children's life preservers.

(a) The lockers or boxes in which children's life preservers are stowed and also the number contained therein shall be marked in at least two inch letters and figures:

20
CHILDREN'S LIFE PRESERVERS

§ 78.47–53 Automatic ventilation dampers.

(a) The manual operating positions for automatic fire dampers in ventilation ducts passing through main vertical zone bulkheads shall be identified by red letters at least ½ inch high "VENTILATION FIRE DAMPER." In addition, the open and closed positions shall be similarly marked.

§ 78.47–55 Instructions for changing steering gear.

(a) Instructions in at least ½ inch letters and figures shall be posted in the steering engine room, relating in order, the different steps to be taken in changing to the emergency steering gear. Each clutch, gear, wheel, lever, valve or switch which is used during the change-over shall be numbered or lettered on a metal plate or painted so that the markings can be recognized at a reasonable distance. The instructions shall indicate each clutch or pin to be "in" or "out" and each valve or switch which is to be "opened" or "closed" in shifting to any means of steering for which the vessel is equipped. Instructions shall be included to line up all steering wheels and rudder amidship before changing gears.

§ 78.47–57 Rudder orders.

(a) At all steering stations, there shall be installed a suitable notice on the wheel or device or in such other position as to be directly in the helmsman's line of vision, to indicate the direction in which the wheel or device must be turned for "right rudder" and for "left rudder."

§ 78.47–60 Lifeboats.

(a) The name of the vessel shall be plainly marked or painted on each side of the bow of each lifeboat in letters not less than 3 inches high. For vessels on an international voyage, the vessel's port of registry shall be added in similar type letters.

(b) The number of each lifeboat shall be plainly marked or painted on each side of the bow of each lifeboat in figures not less than 3 inches high. The lifeboats on each side of the vessel shall be numbered from forward aft, with the odd numbers on the starboard side. Where nested lifeboats are permitted, the upper lifeboat shall be numbered in the normal manner and the lower lifeboat shall have the same number followed by the letter "A".

(c) The cubical contents and number of persons allowed to be carried in each lifeboat shall be plainly marked or painted on each side of the bow of each lifeboat in letters and numbers not less than 1½ inches high. In addition, the number of persons allowed shall be plainly marked or painted on top of at least 2 thwarts in letters and numbers not less than 3 inches high.

(d) All oars shall be conspicuously marked with the vessel's name.

(e) Where mechanical disengaging apparatus is used, the control effecting the release of the lifeboat shall be painted bright red and shall have thereon in raised letters either the words—"DANGER—LEVER DROPS BOAT", or the words—"DANGER—LEVER RELEASES HOOKS".

(f) The top of thwarts, side benches and footings of lifeboats shall be painted or otherwise colored international orange. The area in way of the red mechanical disengaging gear control lever, from the keel to the side bench, shall be painted or otherwise colored white, to provide a constrasting background for the lever. This band of white should be approximately 12 inches wide depending on the internal arrangements of the lifeboat.

§ 78.47–63 Liferafts, lifefloats, and buoyant apparatus.

(a) Rigid type liferafts, lifefloats, and buoyant apparatus, together with their oars and paddles, shall be conspicuously marked with the vessel's name. For vessels on an international voyage, the vessel's port of registry also shall be similarly marked on lifefloats and buoyant apparatus.

(b) The number of persons allowed on each rigid type liferaft, lifefloat, and buoyant apparatus shall be conspicuously marked or painted thereon in letters and numbers at least 1½ inches high.

(c) There shall be stenciled in a conspicuous place in the immediate vicinity of each inflatable liferaft the following:

INFLATABLE LIFERAFT NO. ------
------ PERSONS CAPACITY

These markings shall not be placed on the inflatable liferaft containers.

NOTE: § 160.051–8(a) of Subchapter Q (Specifications) of this chapter requires permanently attached nameplates on each inflatable liferaft and carrying case. The nameplate contains the following information: The name of manufacturer, approval number, the manufacturer's model number, serial number, and lot number, and the number of persons for which the inflatable liferaft is approved. In addition, the carrying case shall be marked "Ocean Service Equipment" or "Limited Service Equipment" as applicable, together with the marine inspector's initials, the date, and the letters "USCG."

§ 78.47–65 Life preservers, wood floats, and ring life buoys.

(a) All life preservers, wood floats, and ring life buoys shall be marked with the vessel's name. For vessels on an international voyage, the vessel's port of registry shall be added in similar type letters on all ring life buoys.

§ 78.47–67 Fire hose and axes.

(a) All fire hose and axes shall be marked with the vessel's name.

§ 78.47–70 Portable magazine chests.

(a) Portable magazine chest shall be marked in letters of at least 3 inches high "PORTABLE MAGAZINE CHEST—FLAMMABLE—KEEP LIGHTS AND FIRE AWAY".

§ 78.47–90 Vessels contracted for prior to November 19, 1952.

(a) Vessels contracted for prior to November 19, 1952, shall meet the requirements of this paragraph.

(1) The requirements of §§ 78.47–5 through 78.47–70 shall be met with the exception that existing signs and markings containing the same general intent, but not necessarily identical wording or exact letter type, size, or color, may be retained so long as they are in good condition to the satisfaction of the Officer in Charge, Marine Inspection.

Subpart 78.49—Posting Placards of Instructions for Launching and Inflating Inflatable Liferafts

§ 78.49–1 When required.

(a) Every vessel equipped with inflatable liferafts shall have posted in conspicuous places which are regularly accessible to the crew and/or passengers, approved placards containing instructions for launching and inflating inflatable liferafts for the information of persons on board. The number and location of such placards shall be as determined necessary by the Officer in Charge, Marine Inspection.

(b) Under the requirements contained in § 160.051–6(c)(1) of Subpart 160.051 in Subchapter Q (Specifications) of this chapter, the manufacturer of approved inflatable liferafts is required to provide approved placards containing such instructions with each liferaft.

Subpart 78.50—Markings on Vessels

§ 78.50–1 Application.

(a) The provisions of this subpart shall apply to all vessels except as specifically noted in this subpart.

§ 78.50–5 Markings required by customs regulations.

(a) The following markings are required by the Customs Regulations. Details of the application of the requirements as well as details of the required markings will be found in those regulations:

(1) Name of Vessel—On both bows and the stern. On steam vessels the name is also required on both sides of the pilothouse, and on steam paddle wheel vessels on the outer side of each paddle box.

(2) Hailing Port—On the stern.

(3) Official Number—On the vessel's main beam.

(4) Net Tonnage—On the vessel's main beam.

§ 78.50–10 Draft marks.

(a) All vessels 50 gross tons and over, under the jurisdiction of the U.S. Coast Guard, shall have the draft of the vessel plainly and legibly marked upon the stem and upon the sternpost or rudderpost or at any place at the stern of the vessel as may be necessary for easy observance. The draft shall be taken from the bottom of the keel at the marks to the surface of the water, the bottom of the mark to indicate the draft in feet.

(b) In cases where the keel does not extend forward or aft to the location of the draft marks, due to raked stem or cut-away skeg, the datum line from which the draft shall be taken shall be obtained by projecting the line of the bottom of keel forward or aft, as the case may be, to the location of the draft marks.

(c) In cases where a vessel may have a skeg or other appendage extending locally below the line of the keel, the draft at the end of the vessel adjacent to such appendage shall be measured to a line tangent to the lowest part of such appendage and parallel to the line of the bottom of the keel.

§ 78.50–15 Load line marks.

(a) Vessels assigned a load line shall have the deck line and the load line marks permanently scribed or embossed as required by Subchapter E (Load Lines) of this chapter.

Subpart 78.53—Placard of Lifesaving Signals and Breeches Buoy Instructions

§ 78.53–1 Application.

(a) The provisions of this subpart shall apply to all vessels on an international voyage, and to all other vessels of 150 gross tons or over in ocean, coastwise or Great Lakes service.

§ 78.53–5 Availability.

(a) On all vessels to which this subpart applies there shall be posted in the pilothouse and readily available to the deck officer of the watch a placard (Form CG–811) containing instructions for the use of breeches buoys and the lifesaving signals as set forth in Regulation 16, Chapter V, of the International Convention for Safety of Life at Sea, 1960.

These signals shall be used by vessels or persons in distress when communicating with lifesaving stations and maritime rescue units.

(b) A copy of Form CG-811 shall also be conveniently posted in the engine-room and crews quarters of all vessels to which this subpart applies.

Subpart 78.55—Carrying of Excess Steam

§ 78.55-1 Master and chief engineer responsible.

(a) It shall be the duty of the master and the engineer in charge of the boilers of any vessel to require that a steam pressure is not carried in excess of that allowed by the certificate of inspection, and to require that the safety valves, once set and sealed by the inspector, are in no way tampered with or made inoperative except as provided in § 78.33-20.

Subpart 78.57—Routing Instructions

§ 78.57-1 All personnel must comply.

(a) Due to existing mine field dangers, all licensed masters, officers, and certificated seamen on United States vessels shall comply strictly with the routing instructions issued by competent naval authority. Failure to comply with such routing instructions shall be deemed misconduct within the meaning of R. S. 4450, as amended (46 U. S. C. 239). Nothing herein shall be construed as relieving the master of the responsibility for the safety of his vessel.

Subpart 78.60—Compliance With Provisions of Certificate of Inspection

§ 78.60-1 Master or person in charge responsible.

(a) It shall be the duty of the master or other person in charge of the vessel to see that all of the provisions of the certificate of inspection are strictly adhered to. Nothing in this subpart shall be construed as limiting the master or other person in charge of the vessel, at his own responsibility, from diverting from the route prescribed in the certificate of inspection or taking such other steps as he deems necessary and prudent to assist vessels in distress or for other similar emergencies.

Subpart 78.65—Exhibition of License

§ 78.65-1 Licensed officers.

(a) All licensed officers on a vessel shall have their licenses conspicuously displayed as required by R.S. 4446, as amended (46 U.S.C. 232).

Subpart 78.70—De-Energizing of Cargo Hold Lighting Circuits When Grain or Other Combustible Bulk Cargo Is Carried

AUTHORITY: The provisions of this Subpart 78.70 interpret or apply R.S. 4488, as amended, sec. 17, 54 Stat. 166, as amended; 46 U.S.C. 481, 526p. Treasury Department Order 167-38, October 26, 1959, 24 F.R. 8857.

§ 78.70-1 Master's responsibility.

(a) Before loading bulk grain, or similar combustible bulk cargo, the master shall have the lighting circuits to cargo compartments in which the bulk cargo is to be loaded de-energized at the distribution panel or panel board. He shall thereafter have periodic inspections made of the panel or panel board as frequently as necessary to ascertain that the affected circuits remain de-energized while this bulk cargo remains within the vessel.

§ 78.70-5 Warning notice posted.

(a) As a precaution against any subsequent unintentional re-energizing of the circuits specified above, an appropriate notice shall be posted at the location where the control is effected warning against re-energizing these circuits. Such notice shall remain posted while this bulk cargo remains within the vessel.

Subpart 78.75—Motion Picture Film and Equipment

§ 78.75-1 Type required.

(a) Only acetate or slow-burning film may be used. Nitrocellulose film is specifically prohibited.

(b) Projectors shall be of an approved type.

(R.S. 4488, as amended, 46 U.S.C. 481. Treasury Department Order 167-38, October 26, 1959, 24 F.R. 8857)

Subpart 78.80—Power-Operated Industrial Trucks

AUTHORITY: The provisions of this Subpart 78.80 interpret or apply R.S. 4417a, as amended, 4472, as amended, 4488, as amended, 4491, as amended; 46 U.S.C. 391a, 170, 481, 489. Treasury Department Order 167-38, October 26, 1959, 24 F.R. 8857.

§ 78.80-1 Application.

(a) *Power-operated industrial trucks.* (1) Except as provided in subparagraph (3) of this paragraph, power-operated industrial trucks carried on board vessel as part of the vessel's equipment for handling materials of any kind shall be in compliance with the applicable provisions of this subpart.

(2) Except as provided in subparagraph (3) of this paragraph, power-operated industrial trucks placed on board vessels for handling materials of any kind shall be in compliance with the applicable provisions of this subpart when such vessels are within the navigable waters of the United States, its territories and possessions but not including the Panama Canal Zone.

(3) When power-operated industrial trucks are used in spaces not containing dangerous or hazardous articles, as set forth in § 78.80-10(f) of this subpart, the installation of the minimum safety features of § 78.80-7(c) shall be carried out at the earliest opportunity but in any case not later than July 1, 1963.

(b) *Vessels.* (1) Vessels shall be in compliance with the applicable provisions of this subpart during those periods of time when power-operated industrial trucks are on board as part of the vessel's equipment or when such trucks are placed on board for handling materials of any kind.

NOTE: The regulations affecting the use of power-operated industrial trucks on foreign vessels are in Part 146 of Subchapter N (Dangerous Cargoes), or in the case of foreign tank vessels in Subpart 35.70 of Subchapter D (Tank Vessels) of this chapter.

§ 78.80-3 Alternates.

(a) In cases of undue hardship resulting from unavoidable delays in bringing existing power-operated industrial trucks into compliance with the applicable provisions of this subpart, the Commandant may permit the use of alternate equipment, apparatus, or arrangement for such period of time, and to such extent, and upon such conditions as will assure, to the Commandant's satisfaction, a degree of safety consistent with the minimum standards as set forth in this subpart.

(b) The methods and procedures adopted in connection with the modification of existing equipment to meet required laboratory designations will be taken into consideration in granting permission to use alternate arrangements for a limited period of time.

§ 78.80-5 Definitions of terms used in subpart.

(a) Power-operated industrial trucks are considered to be tractors, lift trucks, and other specialized industrial trucks used for material handling on board a vessel.

(b) For the purpose of the regulations in this subpart, the words "flammable" and "inflammable" are interchangeable or synonymous terms.

§ 78.80-7 Approved power-operated industrial trucks.

(a) Where approved power-operated industrial trucks are required by the regulations in this subchapter such approved trucks shall have a specific designation of a recognized testing laboratory. The following laboratories are recognized for the specific type designations listed:

(1) Underwriters' Laboratories, Inc. (Mailing address, P.O. Box 247, Northbrook, Ill., 60062) for trucks having recognized testing laboratory type designations E, EE, EX, G, GS, LP, LPS, D and DS.

(2) Factory Mutual Laboratories, Engineering Division, 1115 Boston-Providence Turnpike, Norwood, Mass., 02062, for trucks having recognized testing laboratory type designations E, EE, EX, G, GS, LP, LPS, D and DS.

(b) Description of recognized testing laboratory type designations are as follows:

(1) The "E" designated units are electrically powered units that have minimum acceptable safeguards against inherent fire hazards.

(2) The "EE" designated units are electrically powered units that have in addition to all of the requirements for the "E" units, the electric motors and all other electrical equipment completely

enclosed. In certain locations the "EE" unit may be used where the use of an "E" unit may not be considered safe.

(3) The "EX" designated units are electrically powered units that differ from the "E" and "EE" units in that the electrical fittings and equipment are so designed, constructed and assembled that the units may be used in certain atmospheres containing flammable vapors or dusts.

(4) The "G" designated units are gasoline powered units having minimum acceptable safeguards against inherent fire hazards.

(5) The "GS" designated units are gasoline powered units that are provided with additional safeguards to the exhaust, fuel and electrical systems. They may be used in some locations where the use of a G unit may not be considered safe.

(6) The "LP" designated units are similar to the "G" units except that they are liquefied petroleum gas engine powered instead of gasoline powered.

(7) The "LPS" designated units are units similar to the "GS" units except that liquefied petroleum gas is used for fuel instead of gasoline.

(8) The "D" designated units are units similar to the "G" units except that they are diesel engine powered instead of gasoline engine powered.

(9) The "DS" designated units are diesel powered units that are provided with additional safeguards to the exhaust, fuel and electrical systems. They may be used in some locations where a "D" unit may not be considered safe.

(c) In addition to the construction and design safety features required in order to obtain a recognized laboratory type designation, approved power-operated industrial trucks shall have at least the following minimum safety features where applicable:

(1) Power-operated industrial trucks shall be equipped with a warning horn, whistle, or gong, or other device that can be heard clearly above the normal shipboard noises.

(2) Wherever power-operated industrial truck operation exposes the operator to danger from falling objects, the truck shall be equipped with a driver's overhead guard. Where overall height of the truck with forks in the lowered position is limited by head room conditions the overhead guard may be omitted.

NOTE: This overhead guard is only intended to offer protection from the impact of small packages, boxes, bagged material, etc., representative of the job application. It is impractical to build a guard of sufficient strength to withstand the impact of a capacity load since such a guard would constitute a safety hazard because its structure would be so large that it might interfere with good visibility and would weigh so much that it might make the truck top-heavy and unstable.

(3) Power-operated fork lift trucks which handle small objects or unstable loads shall be equipped with a vertical load back rest or rack which shall have height, width and strength sufficient to prevent the load, or part of it, from falling toward the mast when the mast is in a position of maximum backward tilt.

(4) The forks on power-operated fork lift trucks shall be secured to the carriage so that unintentional lifting of the toe shall not occur on such application where this lifting may create a hazard. The factor of safety of forks shall be at least 3 to 1, based on the elastic limit of the material.

(5) Fork extensions or other attachments shall be suitably secured to prevent unintentional lifting or displacement on primary forks.

(6) All exposed wheels shall be provided with guards to prevent the wheels from throwing particles at the operator.

(7) Unless the steering mechanism is of a type that prevents road reactions from causing the steering handwheel to spin, the steering knob, if used, shall be of a mushroom type to engage the palm of the operator's hand, or shall be arranged in some other manner to prevent injury. The knob shall be mounted within the perimeter of the wheel.

(8) All steering controls shall be confined within the clearances of the truck, or so guarded that movement of the controls shall not result in injury to the operator when passing obstructions, stanchions, etc.

§ 78.80–10 Use of power-operated industrial truck in various locations.

(a) *Spaces containing explosives.* (1) Except as otherwise provided in this paragraph, power-operated industrial trucks shall not be used in a space in which Class A, Class B, or Class C explosives are stowed.

NOTE: Class A, Class B and Class C explosives are defined in Part 146 of Subchapter N (Dangerous Cargoes) of this chapter.

(2) The Commandant may grant authority for the use of approved power-operated industrial trucks with a recognized testing laboratory designation of EX in spaces in which Class A, Class B or Class C explosives are stowed when it can be shown that such trucks can be used with safety.

(3) In a space in which packaged small arms ammunition without explosive bullets is stowed, only approved power-operated industrial trucks with a recognized testing laboratory designation of EX, EE, LPS, GS and DS may be used for handling cargo including the handling of such packaged small arms ammunition.

(b) *Spaces containing flammable liquids.* (1) In a space in which packaged flammable liquids are stowed, only approved power-operated industrial trucks with a recognized testing laboratory designation of EX, EE, GS, LPS, and DS may be used for handling cargo including the handling of such packaged flammable liquids.

(c) *Spaces containing flammable solids or oxidizing materials.* (1) In a space in which packaged flammable solids or oxidizing materials are stowed, only approved power-operated industrial trucks with a recognized testing laboratory designation of EX, EE, GS, LPS, and DS may be used for handling cargo including the handling of such packaged flammable solids or oxidizing materials.

(2) When flammable solids or oxidizing materials are contained in closed cargo vans or closed containers and no other dangerous cargo is stowed in the hold or compartment, any standard commercial type power-operated industrial truck in safe operating condition and having the minimum safety features of § 78.80–7(c) may be used in the spaces.

(3) When oxidizing materials in bulk are stowed in the holds or compartment, any approved commercial type power-operated industrial truck may be used in the spaces.

(d) *Spaces containing hazardous articles.* (1) In a space in which packaged or baled hazardous articles of a fibrous nature or bulk sulfur are stowed, only approved power-operated industrial trucks with a recognized testing laboratory designation of EX, EE, GS, LPS and DS may be used for handling cargo, including the handling of such packaged or baled hazardous articles of a fibrous nature or bulk sulfur.

(2) When hazardous articles of a fibrous nature are contained in closed cargo vans or closed portable containers and no other dangerous cargo is stowed in the hold or compartment, any standard commercial type power-operated industrial truck in safe operating condition and having the minimum safety features of § 78.80–7(c) may be used in the spaces.

(e) *Spaces containing other dangerous cargoes and hazardous articles.* (1) In a space in which dangerous cargoes or hazardous articles subject to the regulations in Part 146 of this chapter, except those provided for in paragraphs (a), (b), (c) and (d) of this section, any approved power-operated industrial truck may be used to handle cargo including the handling of such dangerous cargoes or hazardous articles.

(f) *Other spaces.* (1) Any standard commercial type power-operated industrial truck in safe operating condition and having the minimum safety features of § 78.80–7(c) may be used in spaces and for handling cargo in spaces not otherwise restricted by regulation in this subpart.

§ 78.80–15 Special operating conditions.

(a) Notification shall be given to the master or senior deck officer on board before placing power-operated industrial trucks in use aboard the vessel.

(b) When power-operated industrial trucks are in use on board vessels subject to the regulations in this subchapter, they shall be in a safe operating condition.

(c) Spaces exposed to carbon monoxide or other hazardous vapors from the exhausts of power-operated industrial trucks shall have adequate ventilation. The concentration of carbon monoxide shall be kept below 100 parts per million in the holds and intermediate decks where persons are working. When necessary, portable blowers of adequate size and location shall be utilized.

(d) The parts and/or equipment of any power-operated industrial truck requiring replacement shall be replaced only by parts and/or equipment equivalent in safety when installed with those used in the original design.

(e) Any truck that emits sparks or flames from the exhaust system shall immediately be removed from service, and not again returned to service until the cause for the emission of such sparks or flames has been eliminated.

(f) When the temperature of any part of the truck is found to be in excess of a safe operating temperature, the truck shall be removed from service until such overheating has been corrected.

(g) Operation of trucks shall be halted immediately and the engines or motors secured, whenever an emergency condition arises aboard the vessel.

(h) Operation of trucks shall be halted immediately and the engines or motors secured in the event of breakage or leakage of containers used for the carriage of flammable liquids, flammable solids or oxidizing materials.

(i) The rated capacity of a truck shall at all times be posted on the truck in a conspicuous place and such capacity shall not be exceeded.

(j) At least one approved 2-pound dry chemical hand portable fire extinguisher, or its approved equivalent, shall be affixed to the truck in a readily accessible position or kept in close proximity available for immediate use.

(k) Vessel's fire-fighting equipment, both fixed (where installed) and portable, in vicinity of space being worked shall be kept ready for immediate use.

§ 78.80–20 Refueling.

(a) *When permitted.* Power-operated industrial trucks are not permitted to be refueled in the hold of a vessel or on the weather deck except under the following conditions:

(1) Trucks using gasoline as fuel may be refueled in the hold or on the weather deck of a vessel only when such refueling is done with an acceptable portable non-spilling fuel handling system of not over 5 gallons capacity. Transfer of gasoline to these portable non-spilling fuel handling devices is not permitted on board the vessel.

(2) Power-operated industrial trucks using liquefied petroleum gas as fuel may be refueled in the hold or on the weather deck of a vessel only when fitted with removable tanks and provided the hand-operated shut-off valve of the depleted tank is closed and the engine is run until it stalls from lack of fuel before the quick disconnect fitting is opened. In addition, the quick disconnect fitting shall be attached to the fuel tank before the hand-operated shut-off valve is reopened.

(3) Power-operated industrial trucks using diesel oil as fuel may be refueled on the weather deck or in the hold of a vessel by means of portable containers of not over 5-gallon capacity. These trucks may also be refueled on the weather deck of a vessel or portable containers refilled from a larger container provided a suitable pump is used for the transfer operation and a drip pan of adequate size is supplied.

(b) *General requirements.* The following conditions must be met when refueling power-operated industrial trucks in the hold of a vessel or on the weather deck under the circumstances listed in paragraph (a) of this section:

(1) Refueling shall be under the direct supervision of an experienced and responsible person specifically designated for such job by the person in charge of the loading or unloading of the vessel.

(2) No refueling shall be undertaken with less than 2 persons specifically assigned and present for the complete operation, at least one of whom shall be experienced in using the portable fire extinguishers required in the fueling area.

(3) At least one approved 4-pound dry chemical hand portable fire extinguisher, or its approved equivalent shall be provided at the scene of the fueling area. This is in addition to portable extinguisher affixed to the truck in accordance with § 78.80–15(j).

(4) The location for refueling trucks shall be designated by the master or senior deck officer on board the vessel. "No Smoking" signs shall be posted in the area and smoking shall be prohibited.

(5) The location designated for refueling shall be adequately ventilated so as to insure against accumulation of a hazardous concentration of vapors. The ventilation requirements of § 78.80–15(c) when trucks are operating shall also apply when trucks are being refueled.

(6) Truck engines of all trucks in the same hold shall be stopped before any truck in that hold is refueled and before any fuel handling devices or unmounted liquefied petroleum gas cylinders are placed in the hold.

(7) All fuel handling devices and unmounted liquefied petroleum gas containers shall be removed from the hold before any truck engine is started and the trucks again placed in operation.

§ 78.80–25 Charging or replacing batteries.

(a) Batteries for electrically-powered industrial trucks and for the ignition systems of internal combustion engine-powered industrial trucks may be changed in the hold of a vessel provided the following conditions are met:

(1) Suitable handling equipment shall be employed.

(2) Adequate precautions shall be taken to avoid damage to the battery, short circuiting of the battery and spillage of the electrolyte.

(b) Batteries of electrically-powered industrial trucks may be recharged in a hold of a vessel provided the following conditions are met:

(1) The batteries shall be housed in a suitable, ventilated, portable metal container with a suitable outlet at the top for connection of a portable air hose, or shall be placed directly beneath a suitable metal hood with a suitable outlet at the top for connection of a portable air hose. The air hose shall be permanently connected to an exhaust duct leading to the open deck and terminate in a gooseneck or other suitable weather head. If natural ventilation is not practicable or adequate, mechanical means of exhaust shall be employed in conjunction with the duct. The air outlet on the battery container shall be equipped with an interlock switch so arranged that the charging of the battery cannot take place unless the air hose is properly connected to the box.

(2) If mechanical ventilation is used, an additional interlock shall be provided between the fan and the charging circuit so that the fan must be in operation in order to complete the charging circuit for operation. It is preferable that this interlock switch be of a centrifugal type driven by the fan shaft.

(3) The hold shall not contain any cargo coming under the regulations in Part 146 of Subchapter N (Dangerous Cargoes) of this chapter.

(4) The charging facilities may be part of the truck equipment or may be separate from the truck and located inside or outside the cargo hold. The supply or charging circuit (whichever method is used) shall be connected to the truck by a portable plug connection of the break-away type. This portable plug shall be so engaged with the truck battery charging outlet that any movement of the truck away from the charging station will break the connection between the plug and receptacle without exposing any live parts to contact with a conducting surface or object, and without the plug falling to the deck where it may become subject to injury.

(c) All unmounted batteries shall be suitably protected or removed from an area in the hold of the vessel before trucks are operated in that area.

§ 78.80–30 Stowage of power-operated industrial trucks aboard a vessel.

(a) Power-operated industrial trucks may be stowed in any location aboard a vessel provided the following conditions are met:

(1) Gasoline powered trucks shall have all the fuel expended from the system.

(2) Liquefied petroleum gas powered trucks shall have the fuel tanks removed and all the fuel expended from the system.

(b) Power-operated industrial trucks not meeting the conditions set forth in paragraph (a) of this section shall be stowed on the open deck except for intervals such as lunch hours, between work shifts, interdock and intraport movements. If stowed in a fixed metal enclosure located on or above the weather deck, such enclosure shall have access from the weather deck only and shall have adequate ventilation, so ar-

ranged as to remove vapors from both the upper and lower portions of the space.

§ 78.80–35 Stowage of fuel handling devices aboard a vessel.

(d) Flammable liquids and gases to be used as fuels for power-operated industrial trucks shall be marked, labeled and stowed as follows:

(1) They shall be stowed in ICC specification containers, A.S.M.E. containers or portable safety containers having the approval of a recognized testing laboratory, which containers are authorized for the contents.

(2) Containers shall be marked with the name of the contents and shall be labeled in accordance with ICC requirements as follows:

(i) Flammable liquids—"Red Label"; or,

(ii) Flammable gases—"Red Gas Label".

(3) Containers shall be stowed on or above the weather deck in locations designated by the master. ICC specification containers, A.S.M.E. containers, or portable safety containers having the approval of a recognized testing laboratory may be stowed below the weather deck in a paint or lamp locker provided such containers do not exceed 5 gallons capacity each.

(b) Diesel fuel shall be stowed in locations designated by the master.

Subpart 78.85—Prevention of Oil Pollution

§ 78.85–1 Prohibited zones.

(a) All passenger vessels shall be so operated as to meet the requirements of the Oil Pollution Act, 1924 (33 U.S.C. 431–437). In addition, all passenger ships shall be so operated as to avoid discharging any oil or oily ballast which may foul the surface of the sea, within any of the prohibited zones set forth in the Oil Pollution Act, 1961 (33 U.S.C. 1001–1015).

(Sec. 8, 75 Stat. 403; 33 U.S.C. 1007. Treasury Department Order 167–46, November 6, 1961, 26 F.R. 10609)

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PART II

Section 3

Department of the Treasury

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Coast Guard

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Shipping



Title 46—SHIPPING

Chapter I—Coast Guard, Department of the Treasury

SUBCHAPTER I—CARGO AND MISCELLANEOUS VESSELS

PART 90—GENERAL PROVISIONS

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Subpart 90.35—American Bureau of Shipping's Standards

90.35–1 Standards to be used.
90.35–5 Where obtainable.

AUTHORITY: The provisions of this Part 90 issued under R.S. 4405, as amended, 4462, as amended; 46 U.S.C. 375, 416. Interpret or apply R.S. 4399, as amended, 4400, as amended, 4426, as amended, 4427, as amended, sec. 14, 29 Stat. 690, as amended, sec. 10, 35 Stat. 428, as amended, 41 Stat. 305, as amended, secs. 1, 2, 49 Stat. 1544, 1545, as amended, sec. 17, 54 Stat. 166, as amended, sec. 3, 68 Stat. 675; 46 U.S.C. 361, 362, 404, 405, 366, 395, 363, 367, 526p, 50 U.S.C. 198; E.O. 11239, July 31, 1965, 30 F.R. 9671, 3 CFR, 1965 Supp. Treasury Department Orders 120, July 31, 1950, 15 F.R. 6521; 167–14, Nov. 26, 1954, 19 F.R. 8026; CGFR 56–28, July 24, 1956, 21 F.R. 5659, unless otherwise noted.

Subpart 90.01—Authority and Purpose

§ 90.01–1 Purpose of regulations.

(a) The purpose of the regulations in this subchapter is to set forth uniform minimum requirements for cargo and miscellaneous vessels, as listed in Column 5 of Table 90.05–1(a), in accordance with the intent of Title 52 of the Revised Statutes and acts amendatory thereof or supplemental thereto, as well as to implement various International Conventions for Safety of Life at Sea and other treaties which affect the merchant marine. The regulations are necessary to carry out the provisions of law affecting cargo and miscellaneous vessels and such regulations have the force of law.

§ 90.01–5 Assignment of functions.

(a) By Reorganization Plan No. 3 of 1946, effective July 16, 1946, the marine inspection functions of the former Bureau of Marine Inspection and Navigation and its officers and employees were transferred to the Commandant, United States Coast Guard. By Reorganization Plan No. 26 of 1950 (15 F. R. 4935, 3 CFR, 1950 Supp., p. 178, 5 U. S. C. note under 241), effective July 31, 1950, the functions formerly vested in the Commandant, United States Coast Guard, were transferred to the Secretary of the Treasury, with certain specified exceptions. The Secretary of the Treasury by an order dated July 31, 1950 (15 F. R. 6521), delegated to the Commandant the functions formerly performed by him under Reorganization Plan No. 3 of 1946.

§ 90.01–10 Authority for regulations.

(a) *General.* (1) The authority to prescribe regulations generally is set forth in 46 U.S. Code, sections 375 and 416, as well as in certain other provisions in 46 U.S. Code, sections 170, 214, 215, 222, 224, 224a, 226, 228, 229, 230–234, 239, 240, 361, 362, 364, 372, 381, 391, 391a, 392, 393, 399, 400, 402–414, 435, 436, 451–453, 460, 461, 462, 464, 467, 470–482, and 489–498, and acts amendatory thereof or supplemental thereto. Under the provisions of 46 U.S. Code, section 372, the Commandant, United States Coast Guard, superintends the administration of vessel inspection laws and is required to produce a correct and uniform administration of the inspection laws, rules, and regulations.

(b) *Inspection and certification.* (1) The regulations regarding inspection and certification of cargo and miscellaneous vessels interpret or apply 46 U.S. Code, sections 361, 362, 363, 366, 367, 391, 392, 395, 404, 405, 411, 435, and 481, and 50 U.S. Code, section 198.

(c) *Construction and arrangement.* (1) The regulations regarding the construction and arrangement of cargo and miscellaneous vessels interpret or apply 46 U.S. Code, sections 363, 367, 391, 392, 404, 481, and 482, and 50 U.S. Code, section 198.

(d) *Stability.* (1) The regulations regarding stability of cargo and miscellaneous vessels interpret or apply 46 U.S. Code, sections 85a, 88a, 363, 367, 391, 392, 404, 481, 482, and 483, and 50 U.S. Code, section 198.

(e) *Lifesaving equipment.* (1) The regulations regarding lifesaving equipment of cargo and miscellaneous vessels interpret or apply 46 U.S. Code, sections 363, 367, 391, 392, 404, 481, and 526p, and 50 U.S. Code, section 198.

(f) *Fire protection equipment.* (1) The regulations regarding fire protection equipment of cargo and miscellaneous vessels interpret or apply 46 U.S. Code, sections 363, 367, 391, 392, 395, 404, 481, and 526p, and 50 U.S. Code, section 198.

(g) *Vessel control and miscellaneous systems and equipment.* (1) The regulations regarding vessel control and miscellaneous systems and equipment of cargo and miscellaneous vessels interpret or apply 46 U.S. Code, sections 363, 367, 395, 391, 392, 404, and 435, and 50 U.S. Code, section 198.

(h) *Operations.* (1) The regulations regarding operations of cargo and miscellaneous vessels interpret or apply 46 U.S. Code, sections 363, 367, 391, 392, 395, 404, and 435, and 50 U.S. Code, section 198.

(i) *Special construction, arrangement, and provisions for certain dangerous cargoes in bulk.* (1) The regulations regarding special construction, arrangement, and provisions for certain dangerous cargoes in bulk of cargo and miscellaneous vessels interpret or apply 46 U.S. Code, section 170, and 50 U.S. Code, section 198.

Subpart 90.05—Application

§ 90.05–1 Vessels subject to requirements of this subchapter.

(a) This subchapter shall be applicable to all United States flag vessels indicated in Column 5 of Table 90.05–1(a) and to all such foreign vessels which carry 12 or less passengers from any port in the United States to the extent prescribed by law, except as follows:

(1) Any vessel of a foreign nation signatory to the International Convention for Safety of Life at Sea, 1960, and which has on board a current, valid safety equipment certificate.

(2) Any vessel operating exclusively on inland waters which are not navigable waters of the United States.

(3) Any vessel while laid up and dismantled and out of commission.

(4) With the exception of vessels of the U. S. Maritime Administration, any vessel with title vested in the United States and which is used for public purposes.

(b) Notwithstanding the exception previously noted in subparagraph (a)(1) of this section, foreign vessels of novel design or construction or whose operation involves potential unusual risks shall be subject to inspection to the extent necessary to safeguard life and property in United States ports, as further provided by § 2.01–13 of Subchapter A (Procedures Applicable to the Public) of this chapter.

TABLE 90.05-1(a)

Method of propulsion	Size or other limitations [1]	Classes of vessels (including motorboats) examined or inspected under various Coast Guard regulations [1]			
		Vessels inspected and certificated under Subchapter D—Tank Vessels [2]	Vessels inspected and certificated under either Subchapter H—Passenger Vessels [2] [3] [4] or Subchapter T—Small Passenger Vessels [2] [4]	Vessels inspected and certificated under Subchapter I—Cargo and Miscellaneous Vessels [2] [4]	Vessels subject to provisions of Subchapter C—Uninspected Vessels [2] [3]
Column 1	Column 2	Column 3	Column 4	Column 5	Column 6
Steam	Vessels not over 65 feet in length.	All vessels carrying combustible or flammable liquid cargo in bulk.	All vessels carrying more than 6 passengers.[7]	All tugboats and towboats.	All vessels except those covered by columns 3, 4, and 5.[8]
	Vessels over 65 feet in length.	All vessels carrying combustible or flammable liquid cargo in bulk.[8]	1. All vessels carrying more than 12 passengers on an international voyage, except yachts. 2. All vessels of not over 15 gross tons which carry more than 6 passengers.[7] 3. All other vessels carrying passengers, except: a. Yachts. b. Documented cargo or tank vessels issued a permit to carry not more than 16 persons in addition to the crew. c. Towing and fishing vessels, in other than ocean and coastwise service, may carry persons on the legitimate business of the vessel, in addition to crew, but not to exceed one for each net ton of the vessel.	All vessels except those covered by columns 3 and 4.	None.
Motor	Vessels of not over 15 gross tons.	All vessels carrying combustible or flammable liquid cargo in bulk.	All vessels carrying more than 6 passengers.[7]	Those vessels carrying dangerous cargoes when required by 46 CFR Part 98 or 146.	All vessels except those covered by columns 3, 4, and 5.
	Vessels over 15 gross tons except seagoing motor vessels of 300 gross tons and over.	All vessles carrying combustible or flammable liquid cargo in bulk.[8]	1. All vessels carrying more than 12 passengers on an international voyage, except yachts. 2. All vessels not over 65 feet in length which carry more than 6 passengers.[7] 3. All other vessels of over 65 feet in length carrying passengers for hire except documented cargo or tank vessels issued a permit to carry not more than 16 persons in addition to the crew.	All vessels carrying freight for hire except those covered by columns 3 and 4.	All vessels except those covered by columns 3, 4, and 5.
	Seagoing motor vessels of 300 gross tons and over.	All vessels carrying combustible or flammable liquid cargo in bulk.[8]	1. All vessels carrying more than 12 passengers on an international voyage, except yachts. 2. All other vessels carrying passengers, except: a. Yachts. b. Documented cargo or tank vessels issued a permit to carry not more than 16 persons in addition to the crew.	All vessels except those covered by columns 3 and 4, and those engaged in the fishing, oystering, clamming, crabbing, or any other branch of the fishery, kelp, or sponge industry.	All vessels except those covered by columns 3, 4, and 5.
Sail	Vessels not over 700 gross tons.	All vessels carrying combustible or flammable liquid cargo in bulk.	All vessels carrying more than 6 passengers.[7]	Those vessels carrying dangerous cargoes when required by 46 CFR Part 98 or 146.	None.
	Vessels over 700 gross tons.	All vessels carrying combustible or flammable liquid cargo in bulk.	All vessels carrying passengers for hire.	Those vessels carrying dangerous cargoes when required by 46 CFR Part 98 or 146.	None.
Nonself-propelled	Vessels not over 100 gross tons.	All vessels carrying combustible or flammable liquid cargo in bulk.	All vessels carrying more than 6 passengers.[7]	Those vessels carrying dangerous cargoes when required by 46 CFR Part 98 or 146.	All barges carrying passengers except those covered by column 4.
	Vessels over 100 gross tons.	All vessels carrying combustible or flammable liquid cargo in bulk.	All vessels carrying passengers for hire.	All seagoing barges except those covered by columns 3 and 4; and those inland barges carrying dangerous cargoes when required by 46 CFR Part 98 or 146.	All barges carrying passengers except those covered by column 4.

[1] Where length is used in this table it means the length measured from end to end over the deck, excluding sheer. This expression "means a straight line measurement of the overall length from the foremost part of the vessel to the aftermost part of the vessel, measured parallel to the centerline."

[2] Subchapters E (Load Lines), F (Marine Engineering), J (Electrical Engineering), and N (Dangerous Cargoes) of this chapter may also be applicable under certain conditions.

[3] Public nautical schoolships, other than vessels of the Navy and Coast Guard, shall meet the requirements of Part 167 of Subchapter R (Nautical Schools) of this chapter. Civilian nautical schoolships, as defined by 46 U.S.C. 1331, shall meet the requirements of Subchapter H (Passenger Vessels) and Part 168 of Subchapter R (Nautical Schools) of this chapter.

[4] Subchapter H (Passenger Vessels) of this chapter covers only those vessels of 100 gross tons or more. Subchapter T (Small Passenger Vessels) of this chapter covers only those vessels of less than 100 gross tons.

[5] Vessels covered by Subchapters H (Passenger Vessels) or I (Cargo and Miscellaneous Vessels) of this chapter, where the principal purpose or use of the vessel is not for the carriage of liquid cargo, may be granted a permit to carry a limited amount of flammable or combustible liquid cargo in bulk. The portion of the vessel used for the carriage of the flammable or combustible liquid cargo shall meet the requirements of Subchapter D (Tank Vessels) in addition to the requirements of Subchapter H (Passenger Vessels) or I (Cargo and Miscellaneous Vessels) of this chapter.

[6] Any vessel on an international voyage is subject to the requirements of the International Convention for Safety of Life at Sea, 1960.

[7] The meaning of the term "passenger" is as defined in the Act of May 10, 1956 (sec. 1, 70 Stat. 151; 46 U.S.C. 390).

[8] Boilers and machinery are subject to examination on vessels over 40 feet in length.

(R.S. 4472, as amended; 46 U.S.C. 170)

§ 90.05–5 Specific application noted in text.

(a) At the beginning of the various parts, subparts, and sections, a more specific application is generally given for the particular portion of the text involved. This application sets forth the types, sizes, or services or vessels to which the text pertains, and in many cases limits the application of the text to vessels contracted for before or after a specific date. As used in this subchapter, the term "vessels contracted for" includes not only the contracting for the construction of a vessel, but also the contracting for a material alteration to a vessel, the contracting for the conversion of a vessel to a cargo or miscellaneous vessel, and the changing of service or route of a vessel if such change increases or modifies the general requirements for the vessel or increases the hazards to which it might be subjected.

§ 90.05–7 Ocean or unlimited coastwise vessels on inland and Great Lakes Routes.

(a) Vessels inspected and certificated for ocean or unlimited coastwise routes shall be considered suitable for navigation insofar as the provisions of this subchapter are concerned on any inland routes, including the Great Lakes.

§ 90.05–10 Application to vessels on an international voyage.

(a) Where, in various places or portions of this subchapter, requirements are stipulated specifically for "vessels on an international voyage," it is intended that these requirements apply only to vessels subject to the International Convention for Safety of Life at Sea, 1960, which are mechanically propelled vessels of 500 gross tons and over on an international voyage, as defined in § 90.10–17, other than yachts and fishing vessels.

(b) In accordance with Regulation 4, Chapter I (General Provisions) of the International Convention for Safety of Life at Sea, 1960, a vessel which is not normally engaged on an international voyage, but which in exceptional circumstances, is required to undertake a single international voyage may be exempted by the Commandant from any of the requirements of the Regulations of the Convention: *Provided*, That it complies with safety requirements which are adequate, in his opinion, for the voyage which is to be undertaken.

(c) In accordance with Regulation 1(c), Chapter II (Construction) of the International Convention for Safety of Life at Sea, 1960, the Commandant may, if he considers that the sheltered nature and conditions of the voyage are such as to render the application of any specific requirements of Chapter II of this Convention unreasonable or unnecessary; exempt from those requirements individual vessels or classes of vessels which, in the course of their voyage, do not proceed more than 20 miles from the nearest land.

(d) In accordance with Regulation 3 (a), Chapter III (Lifesaving Appliances, Etc.) of the International Convention for Safety of Life at Sea, 1960, the Commandant, if he considers that the sheltered nature and conditions of the voyage are such as to render the application of the full requirements of Chapter III of this Convention unreasonable or unnecessary, may to that extent exempt from the requirements of Chapter III individual vessels or classes of vessels which, in the course of their voyage, do not go more than 20 miles from the nearest land.

§ 90.05–25 Seagoing barge.

(a) All nonself-propelled vessels of 100 gross tons and over that proceed on voyages on the high seas or ocean are subject to inspection and certification as seagoing barges.

(b) In applying the laws and regulations to manned seagoing barges, one criterion for invocation of safety standards is the description of seagoing barges by relative size in gross tons. When it is determined by the Commandant that the gross register tonnage for a particular manned seagoing barge, which is attained by exemptions, reductions, or other devices in the basic gross tonnage formulation, will circumvent or be incompatible with the application of specific safety requirements in the regulations in this subchapter for a manned seagoing barge of such physical size, the Commandant shall prescribe the regulations to be made applicable to such seagoing barge. When the Commandant determines that the gross register tonnage is not a valid criterion for the invocation of safety requirements based on relative size, the parties involved will be informed of the determination and of the regulations applicable to such manned seagoing barges, and before being permitted to operate such seagoing barges, compliance therewith shall be required. Endorsements or notations on the seagoing barge's certificate of inspection may be made as appropriate.

§ 90.05–30 Portable containers—interpretive rulings.

(a) The phrase "drums, barrels, or other packages," as used in R.S. 4417a, as amended (46 U.S.C. 391a), and in R.S. 4472, as amended (46 U.S.C. 170), is interpreted to mean portable containers having a maximum capacity of 110 U.S. gallons and ICC specification cylinders having a water capacity of not more than 1,000 pounds, which are actually loaded and discharged from vessels with their contents intact.

(b) The phrase "inflammable or combustible liquid cargo in bulk" as used in R.S. 4417a, as amended (46 U.S.C. 391a), and in R.S. 4472, as amended (46 U.S.C. 170), is interpreted to include such cargo in portable containers of a capacity of more than 110 U.S. gallons.

(c) The phrase "liquid cargo" as used in R.S. 4417a, as amended (46 U.S.C. 391a), is interpreted to mean inflammable or combustible liquids.

(Interpret or apply R.S. 4417a, as amended, 4472, as amended; 46 U.S.C. 391a, 170)

Subpart 90.10—Definition of Terms Used in This Subchapter

§ 90.10–1 Approved.

This term means approved by the Commandant unless otherwise stated.

§ 90.10–2 Barge.

This term means any nonself-propelled vessel.

§ 90.10–3 Carrying passengers for hire.

The carriage of any person or persons by a vessel for a valuable consideration, whether directly or indirectly flowing to the owner, charterer, operator, agent or any other person interested in the vessel.

§ 90.10–5 Carrying freight for hire.

The carriage of any goods, wares, or merchandise or any other freight for a valuable consideration whether directly or indirectly flowing to the owner, charterer, operator, agent, or any other person interested in the vessel.

§ 90.10–7 Commandant.

This term means the Commandant of the Coast Guard.

§ 90.10–9 Coast Guard District Commander.

This term means an officer of the Coast Guard designated as such by the Commandant to command all Coast Guard activities within his district, which include the inspection, enforcement, and administration of Title 52, Revised Statutes, and acts amendatory thereof or supplemental thereto, and rules and regulations thereunder.

§ 90.10–11 Coastwise.

Under this designation shall be included all vessels normally navigating the waters of any ocean or the Gulf of Mexico 20 nautical miles or less offshore.

§ 90.10–12 Gas free.

This term means free from dangerous concentrations of flammable or toxic gases.

(Interpret or apply R.S. 4417a, as amended, 4472, as amended; 46 U.S.C. 391a, 170)

§ 90.10–13 Great Lakes.

Under this designation shall be included all vessels navigating the Great Lakes.

§ 90.10–15 Headquarters.

This term means the Office of the Commandant, United States Coast Guard, Washington, D.C., 20226.

§ 90.10–17 International voyage.

(a) The term "international voyage" as used in this subchapter shall have the same meaning as that contained in Regulation 2(d), Chapter I of the International Convention for Safety of Life at Sea, 1960, i.e., " 'International voyage' means a voyage from a country to which the present Convention applies to a port outside such country, or conversely; and for this purpose every territory for the

international relations of which a Contracting Government is responsible or for which the United Nations is the administering authority is regarded as a separate country."

(b) The International Convention for Safety of Life at Sea, 1960, does not apply to vessels "solely navigating the Great Lakes of North America and the River St. Lawrence as far east as a straight line drawn from Cap de Rosiers to West Point, Anticosti Island and, on the north side of Anticosti Island, the 63d Meridian." Accordingly, such vessels shall not be considered as being on an "international voyage" for the purpose of this subchapter.

(c) For the purposes of this subchapter the term "territory" as used in paragraph (a) of this section shall be considered to include the Commonwealth of Puerto Rico, the Canal Zone, all possessions of the United States, and all lands held by the United States under a protectorate or mandate.

(d) In addition, although voyages between the continental United States and Hawaii or Alaska, and voyages between Hawaii and Alaska are not "international voyages" under the provisions of the International Convention for Safety of Life at Sea, 1960, such voyages are similar in nature and shall be considered as "international voyages" and subject to the same requirements for the purposes of this subchapter.

§ 90.10–19 Lakes, bays, and sounds.

Under this designation shall be included all vessels navigating the waters of any of the lakes, bays, or sounds other than the waters of the Great Lakes.

§ 90.10–21 Marine inspector or inspector.

These terms mean any person from the civilian or military branch of the Coast Guard assigned under the superintendence and direction of an Officer in Charge, Marine Inspection, or any other person as may be designated for the performance of duties with respect to the inspection, enforcement, and administration of Title 52, Revised Statutes, and acts amendatory thereof or supplemental thereto, and rules and regulations thereunder.

§ 90.10–23 Motorboat.

This term means any vessel indicated in Column 5 of Table 90.05–1(a) 65 feet in length or less which is propelled by machinery (including steam). The length shall be measured from end to end over the deck excluding sheer. This term includes a boat temporarily or permanently equipped with a detachable motor and any such boat when so propelled is subject to the applicable provisions of the Act of April 25, 1940, as amended (secs. 1–22, 54 Stat. 163–167, as amended, 46 U.S.C. 526–526u), and the regulations promulgated thereunder. For the purpose of this subchapter, motorboats are included under the term "vessel" unless specifically noted otherwise. The various classes of motorboats are as follows:

Class A—Any motorboat less than 16 feet in length.
Class 1—Any motorboat 16 feet or over and less than 26 feet in length.
Class 2—Any motorboat 26 feet or over and less than 40 feet in length.
Class 3—Any motorboat 40 feet or over and not more than 65 feet in length.

§ 90.10–24 Nuclear vessel.

(a) A nuclear vessel is a vessel provided with a nuclear powerplant for propulsion or any other purpose, or any vessel handling or processing substantial amounts of radioactive material other than as cargo.

§ 90.10–25 Ocean.

Under this designation shall be included all vessels navigating the waters of any ocean or the Gulf of Mexico more than 20 nautical miles offshore.

§ 90.10–27 Officer in charge, marine inspection.

This term means any person from the civilian or military branch of the Coast Guard designated as such by the Commandant and who, under the superintendence and direction of the Coast Guard District Commander, is in charge of an inspection zone for the performance of duties with respect to the inspections, enforcement, and administration of Title 52, Revised Statutes, and acts amendatory thereof or supplemental thereto, and rules and regulations thereunder.

§ 90.10–29 Passenger.

A passenger is every person other than the master and the members of the crew or other persons employed or engaged in any capacity on board a vessel in the business of that vessel. In the case of a vessel on an international voyage a child under 1 year of age is not counted as a passenger.

§ 90.10–31 Rules of the Road.

(a) The term "Rules of the Road" means the statutory and regulatory rules governing navigation of vessels. These rules are also published by the Coast Guard in pamphlet form as follows:

(1) Rules of the Road—International—Inland (CG–169).

(2) Rules of the Road—Great Lakes (CG–172).

(3) Rules of the Road—Western Rivers (CG–184).

(b) The current editions of the "Rules of the Road" pamphlets may be obtained from any Marine Inspection Office.

§ 90.10–33 Rivers.

Under this designation shall be included all vessels whose naivgation is restricted to rivers and/or canals exclusively, and to such other waters as may be so designated by the Coast Guard District Commander.

§ 90.10–35 Recognized classification society.

The term "recognized classification society" means the American Bureau of Shipping or other classification society recognized by the Commandant.

§ 90.10–36 Seagoing barge.

The phrase "every seagoing barge of one hundred gross tons or over" in subsections 395(a) and 395(b), Title 46, U.S. Code (sec. 10, 35 Stat. 428, as amended), includes every nonself-propelled vessel of 100 gross tons or over, if such vessel will navigate the high seas or ocean. The phrase "nonself-propelled vessel" means a vessel without sufficient means for self-propulsion and is required to be towed.

§ 90.10–37 Vessel.

Where the word "vessel" is used in this subchapter, it shall be considered to include all vessels indicated in Column 5 of Table 90.05–1(a), except as otherwise noted in this subpart.

§ 90.10–39 Western rivers.

For the purpose of this subchapter, the term "western rivers" is as defined in CG–184, "Rules of the Road—Western Rivers."

Subpart 90.15—Equivalents

§ 90.15–1 Conditions under which equivalents may be used.

(a) Where in this subchapter it is provided that a particular fitting, material, appliance, apparatus, or equipment, or type thereof, shall be fitted or carried in a vessel, or that any particular provision shall be made or arrangement shall be adopted, the Commandant may accept in substitution therefor any other fitting, material, apparatus, or equipment, or type thereof, or any other arrangement: *Provided*, That he shall have been satisfied by suitable trials that the fitting, material, appliance, apparatus, or equipment, or type thereof, or the provision or arrangement is at least as effective as that specified in this subchapter.

(b) In any case where it is shown to the satisfaction of the Commandant that the use of any particular equipment, apparatus, or arrangement not specifically required by law is unreasonable or impracticable, the Commandant may permit the use of alternate equipment, apparatus, or arrangement to such an extent and upon such conditions as will insure, to his satisfaction, a degree of safety consistent with the minimum standards set forth in this subchapter.

Subpart 90.20—General Marine Engineering Requirements

§ 90.20–1 Marine engineering details.

(a) All marine engineering details such as piping, valves, fittings, boilers, pressure vessels, etc., and their appurtenances installed on the vessel, shall be designed, constructed, and installed in accordance with the provisions of Subchapter F (Marine Engineering) of this chapter.

(R.S. 4418, as amended, 4433, as amended; 46 U.S.C. 392, 411)

§ 90.20–5 Nuclear vessels.

(a) Nuclear vessels shall comply with the applicable requirements in Subpart 57.30 of Part 57 of Subchapter F (Marine Engineering) of this chapter. The reg-

ulations covering the transportation and handling of radioactive materials as cargo are contained in Part 146 of Subchapter N (Dangerous Cargoes) of this chapter.

(Sec. 2, 23 Stat. 118, as amended, secs. 2, 633, 63 Stat. 496, 545; 46 U.S.C. 2, 14 U.S.C. 2, 633. Interpret or apply R.S. 4417, as amended, 4417a, as amended, 4418, as amended, 4472, as amended, sec. 3, 54 Stat. 347, as amended, sec. 3, 70 Stat. 152; 46 U.S.C. 391, 391a, 392, 170, 1333, 390b. Treasury Department Order 167-17, June 29, 1955, 20 F.R. 4976)

Subpart 90.25—General Electrical Engineering Requirements

§ 90.25-1 Electrical engineering details.

(a) All electrical engineering details and installations shall be designed and installed in accordance with Subchapter J (Electrical Engineering) of this chapter.

(R.S. 4418, as amended; 46 U.S.C. 392)

Subpart 90.30—Special Provisions

§ 90.30-1 Vessels acquired or documented under the act of August 9, 1954.

(a) Vessels acquired or documented under the Act of August 9, 1954 (sec. 3, 68 Stat. 675; 50 U.S.C. 198), shall be subject to the applicable provisions of Title 52 of the Revised Statutes, acts amendatory thereof or supplemental thereto and the rules and regulations thereunder.

(b) Unapproved lifesaving, firefighting, and other equipment may be continued in service as long as, in the opinion of the Officer in Charge, Marine Inspection, such equipment is in good and serviceable condition. All replacements shall be in accordance with Coast Guard requirements.

§ 90.30-5 Installations of equipment made during the unlimited national emergency declared by the President on May 27, 1941.

(a) Boilers, pressure vessels, machinery, piping, electrical, and other installations, including lifesaving, firefighting, and other safety equipment, installed on vessels during the Unlimited National Emergency declared by the President on May 27, 1941, and prior to the termination of Title V of the Second War Powers Act, as extended (sec. 501, 56 Stat. 180, 50 U.S.C. App. 635), which do not fully meet the detailed requirements of the regulations in this chapter, may be continued in service if found to be satisfactory by the Commandant for the purpose intended.

Subpart 90.35—American Bureau of Shipping's Standards

AUTHORITY: The provisions of this Subpart 90.35 interpret or apply sec. 25, 41 Stat. 998, as amended; 46 U.S.C. 881.

§ 90.35-1 Standards to be used.

(a) Where in this subchapter an item, or method of construction, or testing is required to meet the standards established by the American Bureau of Shipping, the current standards in effect at the time of construction of the vessel, or otherwise as applicable, shall be used. The current standards of other recognized classification societies may also be accepted upon approval by the Commandant.

§ 90.35-5 Where obtainable.

(a) The standards established by the American Bureau of Shipping are usually published annually and may be purchased from the American Bureau of Shipping, 45 Broad Street, New York, N.Y., 10004. These standards may be also examined at the Office of the Commandant (M), U.S. Coast Guard, Washington, D.C., 20226, or at the Office of any Coast Guard District Commander or Officer in Charge, Marine Inspection.

PART 91—INSPECTION AND CERTIFICATION

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Subpart 91.40—Drydocking

91.40-1 When required.
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Subpart 91.45—Repairs and Alterations

91.45-1 Notice required.
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Subpart 91.50—Special Operating Requirements

91.50-1 Inspection and testing required when making alterations, repairs, or other such operations involving riveting, welding, burning or like fire-producing actions.

Subpart 91.55—Plan Approval

91.55-1 General.
91.55-5 Plans and specifications required for new construction.
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Subpart 91.60—Certificates Under International Convention for Safety of Life at Sea, 1960

91.60-1 Application.
91.60-5 Cargo Ship Safety Construction Certificate.
91.60-10 Cargo Ship Safety Equipment Certificate.
91.60-15 Cargo Ship Safety Radiotelegraphy Certificate.
91.60-20 Cargo Ship Safety Radiotelephony Certificate.
91.60-25 Exemption Certificate.
91.60-30 Nuclear Cargo Ship Safety Certificate.
91.60-35 Posting of Convention certificates.
91.60-40 Duration of certificates.
91.60-45 American Bureau of Shipping.

AUTHORITY: The provisions of Part 91 issued under R.S. 4405, as amended, 4462, as amended; 46 U.S.C. 375, 416. Interpret or apply R.S. 4399, as amended, 4400, as amended, 4417, as amended, 4418, as amended, 4426, as amended, 4427, as amended, 4433, as amended, 4453, as amended, 4488, as amended, sec. 14, 29 Stat. 690, as amended, sec. 10, 35 Stat. 428, as amended, 41 Stat. 305, as amended, secs. 1, 2, 49 Stat. 1544, 1545, as amended, sec. 17, 54 Stat. 166, as amended, sec. 3, 68 Stat. 675; 46 U.S.C. 361, 362, 391, 392, 404, 405, 411, 435, 481, 366, 395, 363, 367, 526p, 50 U.S.C. 198; E.O. 11239, July 31, 1965, 30 F.R. 9671, 3 CFR, 1965 Supp. Treasury Department Orders 120, July 31, 1950, 15 F.R. 6521; 167-14, Nov. 26, 1954, 19 F.R. 8026; CGFR 56-28, July 24, 1956, 21 F.R. 5659; 167-38, Oct. 26, 1959, 24 F.R. 8857, unless otherwise noted.

Subpart 91.01—Certificate of Inspection

AUTHORITY: The provisions of this Subpart 91.01 interpret or apply R.S. 4421, as amended, 4423, as amended, sec. 12, 35 Stat. 428, as amended; 46 U.S.C. 399, 400, 397.

§ 91.01–1 When required.

(a) Except as noted in this subpart or Subpart 91.05, no vessel subject to inspection and certification shall be operated without a valid certificate of inspection.

§ 91.01–5 Posting.

(a) On vessels of over 25 gross tons, the original certificate of inspection shall, in general, be framed under glass and posted in a conspicuous place where it will be most likely to be observed. On vessels not over 25 gross tons, and on other vessels such as barges, where the framing of the certificate under glass would be impracticable, the original certificate of inspection shall be kept on board to be shown on demand.

§ 91.01–10 Period of validity.

(a) Certificates of inspection will be issued for periods of either 1 or 2 years. Application may be made by the master, owner, or agent for inspection and issuance of a new certificate of inspection at any time during the period of validity of the current certificate. For nuclear vessels, the period of validity shall be 1 year.

(b) Certificates of inspection may be revoked or suspended by the Coast Guard where such process is authorized by law. This may occur if the vessel does not meet the requirements of law or regulations in this chapter or if there is a failure to maintain the safety requirements requisite to the issuance of a certificate of inspection.

(c)(1) In the case of the following vessels, modification of the period of validity of the certificate of inspection will be permitted as set forth in this paragraph:

(i) Nonself-propelled vessels of 100 gross tons and over proceeding on the high seas or ocean for the sole purpose of changing place of employment.

(ii) Nonself-propelled vessels of 100 gross tons and over making rare or infrequent voyages on the high seas or ocean and returning to the port of departure.

(2) The certificate of inspection may be issued for a specific period of time to cover a described situation or for one voyage only but in no case to exceed 2 years. The certificate of inspection will include the conditions under which the vessel must operate. Unless the vessel is in compliance with this Subchapter insofar as it applies to seagoing barges of 100 gross tons and over, such vessel shall not carry any person on board while underway, and the certificate of inspection will be endorsed as an unmanned seagoing barge.

§ 91.01–15 Temporary certificate.

(a) If necessary to prevent delay of the vessel, a temporary certificate of inspection, Form CG–854, shall be issued pending the issuance and delivery of the regular certificate of inspection. Such temporary certificate shall be carried in the same manner as the regular certificate and shall in all ways be considered the same as the regular certificate of inspection which it represents.

§ 91.01–20 Expired certificate.

(a) Nothing in this subpart shall prevent a vessel upon a regularly established line from a port in the United States to a port of a foreign country not contiguous to the United States whose certificate of inspection expires at sea or while said vessel is in a foreign port or a port of Hawaii from lawfully completing her voyage without the valid certificate of inspection or temporary certificate required by this subpart: *Provided*, That the certificate of inspection did not expire within 15 days after the vessel left the last port of the United States, and that the voyage shall be completed within 30 days after the expiration of the certificate of inspection.

Subpart 91.05—Permit To Proceed to Another Port for Repair

§ 91.05–1 When issued.

(a) The Officer in Charge, Marine Inspection, may issue a permit to proceed to another port for repair, Form CG–948 to a vessel, if in his judgment it can be done with safety, even if the certificate of inspection of the vessel has expired or is about to expire.

§ 91.05–5 To whom issued.

(a) Such permit will only be issued upon the written application of the master, owner, or agent of the vessel.

§ 91.05–10 Conditions of permit.

(a) The permit will state upon its face the conditions under which it is issued and whether or not the vessel is permitted to carry freight or passengers.

§ 91.05–15 Posting.

(a) The permit shall be carried in a manner similar to that described in § 91.01–5 for a certificate of inspection.

Subpart 91.15—Inspection of Vessels

§ 91.15–1 Standard in inspection of hulls, boilers, and machinery.

(a) In the inspection of hulls, boilers, and machinery of vessels, the standards established by the American Bureau of Shipping, see Subpart 90.35 of this subchapter, respecting material and construction of hulls, boilers, and machinery, and the certificate of classification referring thereto, except where otherwise provided for by the rules and regulations in this subchapter, Subchapter E (Load Lines), Subchapter F (Marine Engineering), or Subchapter J (Electrical Engineering) of this chapter shall be accepted as standard by the inspectors.

Subpart 91.20—Initial Inspection

§ 91.20–1 Prerequisite of certificate of inspection.

(a) The initial inspection is a prerequisite of the issuance of the original certificate of inspection.

§ 91.20–5 When made.

(a) The original inspection will only be made upon the written application of the owner or builder of the vessel to the Officer in Charge, Marine Inspection, on Form CG–3752, Application for Inspection of U.S. Vessel, at or nearest the port where the vessel is located.

§ 91.20–10 Plans.

(a) Before application for inspection is made, and before construction is started, the owner or builder shall have plans approved by the Commandant indicating the proposed arrangement and construction of the vessel. The procedure for submitting plans and the list of plans to be supplied is set forth in Subpart 91.55.

§ 91.20–15 Scope of inspection.

(a) The initial inspection, which may consist of a series of inspections during the construction of a vessel, shall include a complete inspection of the structure, machinery, and equipment, including the outside of the vessel's bottom, and the inside and outside of the boilers. The inspection shall be such as to insure that the arrangements, materials, and scantlings of the structure, boilers and other pressure vessels and their appurtenances, piping, main and auxiliary machinery, electrical installations, lifesaving appliances, fire-detecting and extinguishing equipment, pilot ladders, and other equipment fully comply with the applicable regulations for such vessel and are in accordance with approved plans, and that the radio installations, including fixed and portable radios for lifeboats, are in accordance with the requirements of the Federal Communications Commission. The inspection shall also be such as to insure that the workmanship of all parts of the vessel and its equipment is in all respects satisfactory, and that the vessel is provided with lights, means of making sound signals and distress signals as required by applicable regulations and the applicable "Rules of the Road."

(b) When equipment is installed which is not required by applicable regulations in this subchapter, that equipment shall be inspected and tested as required for such equipment by applicable regulations in Subchapter H (Passenger Vessels) of this chapter. For example, fire-detecting systems shall be inspected and tested as required by Subpart 71.20 of Subchapter H (Passenger Vessels) of this chapter.

(c) For nuclear vessels, the inspections required by this section shall be made except insofar as they may be limited by the presence of radiation. In addition, the inspection shall include any special requirements of the vessel's "Safety Assessment."

§ 91.20–20 Specific tests and inspections.

(a) The applicable tests and inspections as set forth in Subpart 91.25 of this part shall be made at this time. In addition, the following specific tests and inspections shall be made by the inspector.

(1) Installation of lifeboats, davits, and winches—see Subpart 94.35 of this subchapter.

(2) Installation of carbon dioxide extinguishing piping—see § 95.15–15 of this subchapter.

(3) For inspection procedures of marine engineering equipment and systems, see Subchapter F (Marine Engineering) of this chapter.

(4) For inspection procedures of Electrical Engineering equipment and systems, see Subchapter J (Electrical Engineering) of this chapter.

(5) For inspection and tests of tanks containing certain dangerous cargoes in bulk, see Part 98 of this subchapter.

Subpart 91.25—Inspection for Certification

§ 91.25–1 Prerequisite of reissuance of certificate of inspection.

(a) An inspection for certification is a prerequisite of the reissuance of a certificate of inspection.

§ 91.25–5 When made.

(a) The inspection for certification will be made only upon written application of the master, owner, or agent of the vessel on Form CG–3752, Application for Inspection of U.S. Vessel, to the Officer in Charge, Marine Inspection, at or nearest the port where the vessel is located.

§ 91.25–10 Scope of inspection.

(a) The inspection for certification shall include an inspection of the structure, boilers, and other pressure vessels, machinery, and equipment. The inspection shall be such as to insure that the vessel, as regards the structure, boilers and other pressure vessels, and their appurtenances, piping, main and auxiliary machinery, electrical installations, lifesaving appliances, fire-detecting and extinguishing equipment, pilot ladders, and other equipment, is in satisfactory condition and fit for the service for which it is intended, and that it complies with the applicable regulations for such vessel, and that the radio installation is in compliance with the requirements of the Federal Communications Commission. The lights and means of making sound signals and the distress signals carried by the vessels shall also be subject to the above mentioned annual inspection for the purpose of insuring that they comply with the requirements of the applicable regulations and the applicable Rules of the Road.

(b) For nuclear vessels, the inspections required by this section shall be made except insofar as they may be limited by the presence of radiation. In addition, the inspection shall include any special requirements of the vessel's "Safety Assessment."

(c) When equipment is installed which is not required by applicable regulations in this subchapter, that equipment shall be inspected and tested as required for such equipment by applicable regulations in Subchapter H (Passenger Vessels) of this chapter. For example, fire-detecting systems shall be inspected and tested as required by Subpart 71.25 of Subchapter H (Passenger Vessels) of this chapter.

§ 91.25–15 Lifesaving equipment.

(a) At each inspection for certification, except as modified in subparagraph (2) of this paragraph, the marine inspector shall conduct the following tests and inspections of lifesaving equipment:

(1) It shall be demonstrated that the air tanks of all lifesaving appliances are airtight.

(2) Each lifeboat shall be lowered to near the water and then be loaded with its allowed capacity, evenly distributed throughout the length, and then be lowered into the water until it is afloat, and be released from the falls. In making this test persons or deadweight may be used. The total weight used shall be at least equal to the allowed capacity of the lifeboat considering persons to weigh 165 pounds each. This test shall be made at least once in each two-year period. If practicable it shall be made at the inspection for certification or at a reinspection.

(3) Each life preserver shall be examined to determine its serviceability. If found to be satisfactory, it will be stamped "Passed," together with the date, the port, and the inspector's initials. If not in a serviceable condition, the life preserver shall be removed from the vessel's equipment, and if beyond repair, shall be destroyed in the presence of the inspector.

(4) All lifeboat winch electrical control apparatus shall be opened up and inspected.

(5) Where gravity davits are installed, it shall be demonstrated that the lifeboat can be swung out and lowered from any stopped position by merely releasing the brake on the lifeboat winch. The use of force to start the davits or the lifeboat winch will not be permitted.

(6) Inflatable liferafts shall be serviced at an approved servicing facility in accordance with the provisions of Subpart 160.051 of Subchapter Q (Specifications) of this chapter. Inflatable liferafts shall be serviced at an approved servicing facility every 12 months or not later than the next vessel inspection for certification provided the total time since date of last servicing does not exceed 15 months. The period for servicing is computed from the date of last servicing. Except in emergencies no servicing should be done aboard vessels. If at any time external damage is found to the container or straps or if the seal is broken, the Officer in Charge, Marine Inspection, shall be notified and the raft shall be serviced by an approved servicing facility.

NOTE: After the raft has been satisfactorily serviced in the presence of a marine inspector at an approved servicing facility, the raft is repacked and sealed and the carrying case stamped "PASSED" together with the date, port, and the marine inspector's initials.

(7) All other items of lifesaving equipment shall be examined to determine that they are in suitable condition.

§ 91.25–20 Fire-extinguishing equipment.

(a) At each inspection for certification and at such other times as considered necessary the inspector shall determine that all fire-extinguishing equipment is in suitable condition and may require such tests as are considered necessary to determine the condition of the equipment. The inspector shall determine if the tests and inspections required by § 97.15–60 of this subchapter have been conducted. At each inspection for certification the inspector shall conduct the following tests and inspections of fire-extinguishing equipment:

(1) All hand portable fire extinguishers and semi-portable fire extinguishing systems shall be checked as noted in Table 91.25–20 (a) (1). In addition, the hand portable fire extinguishers and semi-portable fire extinguishing systems shall be examined for excessive corrosion and general condition.

TABLE 91.25–20(a)(1)

Type unit	Test
Soda acid	Discharge. Clean hose and inside of extinguisher thoroughly. Recharge.
Foam	Discharge. Clean hose and inside of extinguisher thoroughly. Recharge.
Pump tank (water or antifreeze).	Discharge. Clean hose and inside of extinguisher thoroughly. Recharge with clean water or antifreeze.
Cartridge operated (water, antifreeze or loaded stream).	Examine pressure cartridge and replace if end is punctured or if cartridge is otherwise determined to have leaked or to be in unsuitable condition. Remove liquid. Clean hose and inside of extinguisher thoroughly. Recharge with clean water, solution, or antifreeze. Insert charged cartridge.
Carbon dioxide	Weigh cylinders. Recharge if weight loss exceeds 10 percent of weight of charge. Inspect hose and nozzle to be sure they are clear.[1]
Dry chemical (cartridge-operated type).	Examine pressure cartridge and replace if end is punctured or if cartridge is otherwise determined to have leaked or to be in unsuitable condition. Inspect hose and nozzle to see they are clear. Insert charged cartridge. Be sure dry chemical is free-flowing (not caked) and chamber contains full charge.
Dry chemical (stored pressure type).	See that pressure gage is in operating range. If not, or if seal is broken, weigh or otherwise determine that full charge of dry chemical is in extinguisher. Recharge if pressure is low or if dry chemical is needed.
Vaporizing liquid[2] (pump type).	Pump a few strokes into clean pail and replace liquid. Keep water out of extinguisher or liquid. Keep extinguisher completely full of liquid.
Vaporizing liquid[2] (stored pressure type).	See that pressure gage is in operating range. Weigh or check liquid level to determine that full charge of liquid is in extinguisher. Recharge if pressure is low or if liquid is needed.

[1] Cylinders shall be tested and marked in accordance with the regulations of the Interstate Commerce Commission, as noted in § 147.04–1 of Subchapter N (Dangerous Cargoes) of this chapter.

[2] Vaporizing-liquid type fire extinguishers containing carbon tetrachloride or chlorobromomethane or other toxic vaporizing liquids shall be removed from all vessels. (See § 95.50–5(c) of this subchapter.)

(2) Fixed fire-extinguishing systems shall be checked as noted in Table 91.25-20 (a) (2). In addition, all parts of the fixed fire-extinguishing systems, shall be examined for excessive corrosion and general conditions.

TABLE 91.25-20 (a) (2)

Type system	Test
Foam	Systems utilizing a soda solution shall have such solution replaced. In all cases, ascertain that powder is not caked.
Carbon dioxide	Weigh cylinders. Recharge if weight loss exceeds 10 percent of weight of charge.[1]

[1] Cylinders shall be tested and marked in accordance with the regulations of the Interstate Commerce Commission, as noted in § 147.04-1 of Subchapter N (Dangerous Cargoes) of this chapter.

(3) On all fire-extinguishing systems, all piping controls, valves, and alarms shall be checked to ascertain that the system is in operating condition. In this respect, steam smothering lines shall be checked with at least a 50 p. s. i. air pressure with the ends capped or by blowing steam through the lines at the designed pressure.

(4) The fire main system shall be operated and the pressure checked at the most remote and highest outlets. All firehose shall be subjected to a test pressure equivalent to the maximum pressure to which they may be subjected in service, but not less than 100 p. s. i.

§ 91.25-25 Hull equipment.

(a) At each inspection for certification, the inspectors shall conduct the following tests and inspections of hull equipment:

(1) All watertight doors shall be operated locally by manual power and also by hydraulic or electric power if so fitted. Where remote control is fitted, the doors shall also be operated by the remote control apparatus.

(2) The remote controls of all valves shall be operated.

(3) An inspection of the cargo gear shall be required. The inspection may consist of tests and examinations to determine the condition and suitability of the cargo gear. Current valid certificates and registers of cargo gear, issued by recognized nonprofit organizations or associations approved by the Commandant, may be accepted as prima facie evidence of the condition and suitability of the cargo gear. Cargo gear certificates and registers will not be issued by the Coast Guard.

(b) Every acceptable cargo gear certificate and/or register shall be properly executed by a person authorized to do so and shall:

(1) Certify as to the tests and examinations conducted;

(2) Show the dates on which the tests and examinations were conducted; and

(3) Indicate that the cargo gear therein described complies with standards equal to or exceeding those set forth in Subpart 91.37.

(c) Competent persons for the purposes of this section and Subpart 91.37 are:

(1) Coast Guard marine inspectors;

(2) Surveyors of the organizations or associations approved by the Commandant;

(3) Such other persons as are authorized by the regulations in Subpart 91.37 as may be required; and,

(4) Responsible officials or employees of the testing laboratories, companies, or organizations who conduct tests of pieces of loose cargo gear, wire rope, or the annealing of gear as may be required.

(d) The registers issued in connection with cargo gear certification must have all required entries fully completed as of the dates indicated, shall be kept current, and shall include the following:

(1) A register of the cargo handling machinery and the gear accessory thereto carried on the vessel named therein;

(2) Certification of the testing and examination of winches, derricks, and their accessory gear;

(3) Certification of the testing and examination of cranes, hoists, and their accessory gear;

(4) Certification of the testing and examination of chains, rings, hooks, shackles, swivels, and blocks;

(5) Certification of the testing and examination of wire rope;

(6) Certification of the heat-treatment of chains, rings, hooks, shackles, and swivels which require such treatment; and,

(7) Certification of the annual thorough examinations of gear not required to be periodically heat-treated.

(e) It is the responsibility of the master to have a ship's officer inspect cargo gear when required by Subpart 91.37. For those inspected vessels which do not have valid cargo gear certificates and registers as provided by this section, such vessels will be required to have their shipboard cargo gear undergo tests and examinations in accordance with the provisions of Subpart 91.37.

§ 91.25-30 Electrical engineering equipment.

(a) For inspection procedures of electrical engineering equipment and systems see Subchapter J (Electrical Engineering) of this chapter.

§ 91.25-35 Marine engineering equipment.

(a) For inspection procedures of marine engineering equipment and systems, see Subchapter F (Marine Engineering) of this chapter.

§ 91.25-37 Tanks containing dangerous cargoes.

(a) For inspection and tests of tanks containing certain dangerous cargoes in bulk, see Part 98 of this subchapter.

(R.S. 4472, as amended; 46 U.S.C. 170)

§ 91.25-40 Sanitary inspection.

(a) At each inspection for certification, the quarters, toilets, and washing spaces, galleys, serving pantries, lockers, etc., shall be examined by the inspector to be assured that they are in a sanitary condition.

(Sec. 4, 49 Stat. 1935, as amended; 46 U.S.C. 660a)

§ 91.25-45 Fire hazards.

(a) At each inspection for certification, the inspector shall examine the tank tops and bilges in the machinery spaces to see that there is no accumulation of oil which might create a fire hazard.

§ 91.25-50 Inspector not limited.

(a) Nothing in this subpart shall be construed as limiting the inspector from making such tests or inspections as he deems necessary to be assured of the safety and seaworthiness of the vessel.

Subpart 91.27—Reinspection

§ 91.27-1 When made.

(a) At least one reinspection shall be made on each vessel holding a certificate of inspection valid for two years. This reinspection will be made, where possible, between the tenth and fourteenth month of the period for which the certificate is valid.

(b) No written application for reinspection will be required.

§ 91.27-5 Scope.

(a) The inspector shall examine all accessible parts of the vessel's hull, machinery, and equipment to be assured that it is in a satisfactory condition.

(b) In general, the scope of the reinspection shall be the same as for the inspection for certification, but will be in less detail unless it is determined that a major change has occurred since the last inspection.

§ 91.27-10 Deficiencies in maintenance.

(a) If the reinspection reveals deficiencies in the maintenance as called for by the regulations in this subchapter, such necessary repairs or improvements shall be made as may be ordered.

§ 91.27-15 Inspectors not limited.

(a) Nothing in this subpart shall be construed as limiting the inspector from making such tests or inspections as he deems necessary to be assured of the seaworthiness of the vessel.

Subpart 91.30—Inspection After Accident

§ 91.30-1 General or partial survey.

(a) A survey, either general or partial, according to the circumstances, shall be made every time an accident occurs or a defect is discovered which affects the safety of the vessel or the efficacy or completeness of its lifesaving appliances, fire-fighting or other equipment, or whenever any important repairs or renewals are made. The survey shall be such as to insure that the necessary repairs or renewals have been effectively made, that the material and the workmanship of such repairs or renewals are in all respects satisfactory, and that the

vessel complies in all respects with the regulations in this subchapter.

(R.S. 4450, as amended; 46 U.S.C. 239)

Subpart 91.35—Sanitary Inspections

§ 91.35–1 When made.

(a) An inspection of quarters, toilet and washing spaces, serving pantries, galleys, etc., shall be made at least once in every month. If the route of the vessel is such that it is away from a United States port for more than one month, an inspection shall be conducted at least once every trip.

(Sec. 4, 49 Stat. 1935, as amended; 46 U.S.C. 660a)

Subpart 91.37—Inspection of Cargo Gear

§ 91.37–1 When made.

(a) The specific tests and examinations shall be made at the intervals stated in the regulations in this subpart.

(b) A thorough examination of the assembled gear shall be made at least once in every year.

(c) An inspection to determine the condition and suitability of shipboard cargo gear will be made by a marine inspector at each inspection for certification. Inspections may be made at such other times as considered necessary by the Officer in Charge, Marine Inspection.

(d) For vessels fitted with cargo gear, an initial test of the assembled units under proof loads shall be conducted, followed by a complete dismantling or disassembling of such gear and a thorough examination of the parts to ascertain its condition. Subsequent tests of the assembled units under proof loads, followed by a dismantling or disassembling of such gear and a thorough examination shall be made once every 4 years, or oftener if necessary.

§ 91.37–3 Definitions of terms and words used in this subpart.

(a) *Cargo gear.* The term "cargo gear" includes masts, stays, booms, winches, cranes, elevators, conveyors, standing and running gear forming that part of the shipboard cargo gear used in connection with the loading or unloading of a vessel. This term does not include material handling gear and rigging of special design vessels used solely in dredging, pile driving, drilling for mineral deposits, and construction work.

(b) *Dismantling or disassembling of gear.* The "dismantling" or "disassembling" of gear contemplated is the taking apart of units of gear to the extent necessary to determine the suitability of such gear for continued service and as may be specifically required to carry out the intent of a particular regulation in this subpart. After proof load tests the disassembling need not include the sheaves and pins of the blocks included in the test unless there appears to be evidence of deformation or failure.

(c) *Thorough examination.* The "thorough examination" contemplated is a visual examination, supplemented if necessary by other means such as by a hammer test or by a test with electronic or ultrasonic devices.

(d) *Ton.* The word "ton" means a ton of 2,240 pounds.

(e) *Safe working load.* The "safe working load" (SWL) contemplated is the load the gear is approved to lift, excluding the weight of the gear itself.

§ 91.37–5 Tests and examinations of shipboard cargo gear.

(a) For vessels fitted with cargo gear and without valid cargo gear certificates and registers issued by organizations or associations recognized by the Coast Guard, inspections shall be made by competent persons described in § 91.25–25(c) (1) and (2) to determine the condition and suitability of the shipboard cargo gear. For the initial and subsequent quadrennial inspections, all the cranes, winches, hoists, derrick booms, derrick and mast bands, and all parts used in loading or unloading cargo shall be assembled in units and such assembled units shall then be tested under proof loads. The proof loads shall be handled for various types of units as required by specific regulations in this subpart. After the proof load tests of the assembled units of gear have been made, such gear shall be disassembled or dismantled so as to permit them to be thoroughly examined. The sheaves and pins of the blocks included in these proof load tests need not be removed unless there appears to be evidence of deformation or failure.

(b) For vessels fitted with cargo gear and holding valid cargo gear certificates and registers issued by organizations or associations recognized by the Coast Guard, the marine inspectors may accept such certificates as prima facie evidence of compliance with the requirements in this subpart. If an Officer in Charge, Marine Inspection, is in doubt as to the condition and suitability of shipboard cargo gear for such a vessel, the tests and examinations, or such portions thereof as deemed necessary, provided for in this subpart will be required.

(c) If any part or portion of the gear fails or becomes defective during such tests, such defective equipment shall be satisfactorily repaired or replaced.

§ 91.37–10 Cargo gear of special design and limited use.

(a) The regulations in this subpart shall apply to cargo gear of special design and limited use (derrick barges rigged for heavy lifts, cargo booms on self unloaders, etc.) only to the extent that it is practicable to do so. These requirements may be modified by the Officer in Charge, Marine Inspection, where the inspection is performed according to the design characteristics of such cargo gear.

(b) Nondestructive tests, such as radiography, ultrasonic, electronic or other methods, may be utilized to determine the condition of heavy lift gear after it has been unit tested, provided such methods are acceptable to the Officer in Charge, Marine Inspection, having cognizance of the tests. However, no deviations or modifications shall be permitted to lessen the requirements for cargo gear inspection as set forth in § 91.37–70 and the maintenance of the applicable cargo gear records as set forth in § 91.37–75.

§ 91.37–15 Cargo gear plans required when plans are not approved by a classification society.

(a) For a new vessel or a vessel applying for initial inspection, the following plans of cargo gear shall be submitted in triplicate to the Officer in Charge, Marine Inspection, having jurisdiction for approval:

(1) Plans showing a stress diagram with the principal details of the gear.

(2) Plans containing a diagram showing the arrangement of the assembled gear and indicating the safe working load for each component part.

(b) The safe working load on which the design of any component part of the cargo gear is to be based, shall be taken as the maximum resultant load upon the component part in the design conditions assumed. The safe working load of the assembly is the load the gear is approved to lift, excluding the weight of the gear itself.

(c) One approved copy of each set of cargo gear plans shall be retained on the vessel.

§ 91.37–20 Cargo gear plans approved by a classification society.

(a) The plans required by § 91.37–15(a) need not be submitted to the Officer in Charge, Marine Inspection, for approval if such plans are or have been approved by the American Bureau of Shipping or similar classification society recognized by the Commandant.

(b) One approved copy of each set of cargo gear plans shall be retained on the vessel.

§ 91.37–25 Factors of safety.

(a) In the design of the cargo gear, the safety factors in Table 91.37–25(a), taken in association with suitable design assumptions for actual loading conditions, shall be used and regarded as minima.

TABLE 91.37–25(a)

Safe working loads for component parts	Safety factors based on—		
	Ultimate strength	Yield point	Breaking test load
All metal structural parts, except steel booms:			
When the working load of the assembled gear is 10 tons or less	[1] 5	----	----
When the working load of the assembled gear is 13 tons or over	[1] 4	----	----
Steel booms:			
When the working load of the assembled gear is 10 tons or less	----	[1] 3	----
When the working load of the assembled gear is 13 tons or over	----	[1] 2½	----
Wooden structural parts	8	----	----
Chains	4½	----	----
Wire rope:			
For working loads 10 tons or under	----	----	5
For working loads over 10 tons	----	----	4
Fiber rope:			
When intended for running rigging	7	----	----
When intended for fixed gear and vangs	5	----	----

[1] For working loads between 10 and 13 tons, intermediate values of safety factors may be used.

(b) The Commandant will give consideration to the use of factors of safety differing from those given in Table 91.37-25(a) where special materials or cargo gear of special design are to be used.

§ 91.37-30 Loose gear certificates and tests.

(a)(1) Evidence of compliance with the proof load test requirements in this section for all chains, rings, hooks, links, shackles, swivels, blocks, and any other loose gear whether accessory to a machine or not, but which is used as ship's cargo gear shall be listed on an appropriate certificate.

(2) This evidence of test and the recording thereof is required only once with respect to each article of gear so long as each article is identified and the certificates required are available on the vessel.

(3) Proof loads applied to the articles of loose gear shall be as shown in Table 91.37-30(a)(3).

TABLE 91.37-30(a)(3)

Articles of gear	*Proof load*
Chains, rings, hooks, links, shackles, swivels	Twice the safe working load.
Single sheave block	Four times the safe working load.[1]
Multiple sheave block with safe working load up to and including 20 tons.	Twice the safe working load.
Multiple sheave block with safe working load over 20 tons up to and including 40 tons.	20 tons in excess of the safe working load.
Multiple sheave block over 40 tons	One and a half times the safe working load.
Roller chains (pitched chains) used with hand operated chain falls, and rings, hooks, shackles, or swivels permanently attached thereto.	Do.
Chain fall blocks used with roller chains (pitched chains), and rings, hooks, shackles, or swivels permanently attached thereto.	Do.

[1] The proof load applied to the block is equivalent to twice the maximum resultant load on the eye or pin when lifting the safe working load attached to a rope which passes around the sheave of the block. The proof load is, therefore, equal to four times the safe working load or twice the safe working load when the load is attached directly to the block instead of a rope passing around the sheave.

(b) All chains, rings, hooks, links, shackles, swivels, blocks and any other loose gear whether accessory to a machine or not, but which is used or intended for use as ship's cargo gear, shall bear a mark or number by which each piece can be identified and shall be listed on a loose gear certificate. The safe working load "SWL" shall be marked on all blocks.

(c) The certificate shall show the distinguishing number or mark applied to the articles of gear; a description of the articles of gear; the date when the test proof load was applied; and the safe working load. The forms for loose gear certificates shall be as prescribed by and acceptable to associations or organizations approved by the Commandant and shall be suitable for the purposes of this section.

(d) After being tested all of the gear shall be examined to ascertain whether any part has been damaged, permanently deformed by the test or has other visible defects. The pins and sheaves of all tested blocks shall be removed for this purpose. If damaged during these tests, such gear shall be satisfactorily repaired or replaced.

(e) The required examinations as set forth in paragraph (d) of this section may be accomplished by mechanical, electrical or other means provided the method employed is equal in efficiency to the visual examination of disassembled gear.

§ 91.37-35 Test and certification of wire rope.

(a) All wire rope used as shipboard cargo gear shall be able to withstand a breaking test load of at least five times the safe working load. In the case of gear with a lifting capacity of over 10 tons, the breaking test load of wire rope shall be at least four times the safe working load. All wire rope shall be identified and described in a wire rope certificate. Such certificate shall be furnished and attested to by the manufacturer or a testing agency and shall certify:

(1) The breaking test load of a sample of the wire rope, which should be at least five times the safe working load or at least four times the safe working load if part of gear with a lifting capacity of over 10 tons;

(2) The name and address of the manufacturer;

(3) The diameter of the rope in inches and/or fractions thereof;

(4) The number of strands and the number of wires in each strand;

(5) The quality of the wire (e.g. improved plow steel);

(6) The date of the test; and,

(7) The load at which the sample broke.

(b) The forms for the wire rope certificates shall be presented by and acceptable to associations or organizations approved by the Commandant and shall be suitable for the purposes described in this section.

(c) In addition to the manufacturers' or testing agencies' attestations, a sample of the wire rope may be tested to destruction if required by the marine inspector when a visual inspection indicates an apparent defective condition.

§ 91.37-40 Proof test of cargo gear as a unit.

(a) Winches with their accessory gear, including the derricks and attachments, at least once in each four years, shall be tested as a unit with proof loads exceeding the safe working load as set forth in Table 91.37-40(a).

TABLE 91.37-40(a)

Safe working load of assembled gear	*Proof load*
Not exceeding 20 tons	25 percent in excess.
Over 20 tons but not exceeding 50 tons.	5 tons in excess.
Over 50 tons	10 percent in excess.

(b) The proof load applied to winches and their gear shall be lifted with the ship's normal tackle including the winches and with the boom at an angle which should not be greater than 15 degrees to the horizontal or to the lowest angle approved in association with the design, or when these angles are impracticable to the lowest practicable angle. When the load has been lifted, it shall be swung as far as possible in both directions.

(1) Where electrical winches are fitted with electromagnetic or hydraulic brakes at the winch, mechanical brakes for manual operation will not be required, but if so fitted shall be in satisfactory operating condition.

(2) Current for electric winch operation during the test shall be taken from the ship's circuits. Shore current may be used if it passes through the ship's switchboard.

(c) Cranes and other hoisting machines with their accessory gear, at least once in each four years, shall be tested with a proof load which shall exceed the safe working load as set forth in Table 91.37-40(a).

(d) The proof load applied to cranes and hoists shall be lifted, topped and swung (slewed) as far as possible in each direction. If the boom of the crane has a movable radius, it shall be tested with a proof load as set forth in this section at the maximum and minimum radii of the boom. In the case of hydraulic cranes whose capacity is limited by pressure, and with which it is not possible to lift a load 25 percent in excess of the safe working load, the greatest possible load in excess of the safe working load shall be used. These tests and the amounts of the loads shall be recorded.

(e) After satisfactory completion of the proof load testing of the cargo gear in accordance with paragraphs (a), (b), (c) and (d) of this section, the cargo gear and all component parts shall be given a thorough visual examination, supplemented as necessary by other means such as a hammer test or with electronic or ultrasonic devices, to determine if any of the parts were damaged, deformed, or otherwise rendered unsafe for further use. If found defective, such gear shall be replaced.

(1) When the test is being conducted for the first time on a vessel, accessory gear shall be dismantled or disassembled for examination after the test. The sheaves and pins of the blocks included in this test need not be removed unless

there appears to be evidence of deformation or failure.

(2) For subsequent tests such parts of the machinery and gear shall be dismantled and/or disassembled after the test as necessary to determine its suitability for continued service.

(f) Appropriate means shall be provided to prevent the foot of the boom from being accidentally lifted from the socket during the test.

(g) Vessels whose cargo gear has been in use but are without the valid registers and certificates described in § 91.25–25 shall be inspected for defective cargo gear. The gear shall then be tested and examined as prescribed in this section. If the movable weights for proof testing are not reasonably available, a spring or hydraulic scale certified for accuracy may be used. Whenever such scales are used, the proof load shall be applied with the boom swung out as far as possible in one direction and then in the other direction and at such intermediate positions as may be indicated. At any position, the indicator of the scale must maintain a constant reading under the proof load for a period of five minutes.

(h) On all types of winches and cranes efficient means shall be provided to stop and hold the proof load in any position, and the efficiency of such means shall be demonstrated.

(1) Electric winches, electrohydraulic winches fitted with electromagnetic or hydraulic brakes at the winch, or cranes shall be equipped so that a failure of the electric power shall stop the motion and set the brakes without any action on the part of the operator.

(2) Current for electric winches and crane operation during the tests shall be taken from the ship's circuits. Shore current may be used if it passes through the ship's switchboard.

§ 91.37–45 Marking of booms and cranes.

(a) The safe working load (abbreviated "SWL") for the assembled gear shall be marked on the heel of each boom with the minimum angle to the horizontal for which the gear is designed. These letters and figures shall be in contrasting colors to the background and at least one inch in height.

(b) Where the boom is rated at varying capacities depending on the radius, tables indicating the maximum safe working loads for the various working angles of the boom and the maximum and minimum radii at which the boom may be safely used shall be conspicuously posted near the controls and visible to the operator when working the gear.

§ 91.37–50 Use of wire rope and chains.

(a) An eye splice made in any wire rope used as cargo gear, with or without a thimble, shall have at least three tucks with whole strands and two tucks with one half the wire cut from the tucking stand: *Provided,* That this requirement shall not preclude the use of any other form of splice or connection if it is as efficient as the splice specified.

(b) Single wire rope cargo falls, wire rope pendants, topping lifts and preventers shall consist of clear lengths without splices except at the working ends. Wire rope clips shall not be used to form eyes in the working ends of single wire rope cargo falls.

(c) Wire rope shall not be used for shipboard cargo gear if in any length of 8 diameters, the number of visible broken wires exceeds ten percent of the total number of wires in the rope, or if the rope shows other signs of excessive wear, corrosion, kinking, or defect.

(d) Hoisting or sling chains used for shipboard cargo gear shall not be used if a length of chain has been stretched more than five percent of the original length, or the chain has become unsafe through overloading or faulty heat-treatment, or whenever other external defects are evident.

(e) Chains used for shipboard cargo gear shall not be shortened by knotting, bolting, or wiring the links. The use of chains having a knot or kink as shipboard cargo gear is prohibited.

§ 91.37–55 Annealing.

(a) Chains, hooks, rings, links, shackles, and swivels of wrought iron used as cargo gear shall be annealed at the following intervals:

(1) Wrought iron chains and gear in general use and of one-half inch or less, at least once in every six months.

(2) All other wrought iron chains and gear, including topping lift chains, in general use, at least once in every twelve months.

(b) The annealing shall be done in a suitable closed oven and not over an open fire. Wrought iron shall be annealed at a temperature of between 1100° and 1200° Fahrenheit for a period of between 30 and 60 minutes. After being annealed, the article shall be allowed to cool slowly and shall be then tested completely for defects.

(c) The heat-treatment of the cargo gear shall be done only by reputable firms having suitable equipment and personnel trained for this purpose. A certificate attesting to the annealing of all gear heat-treated shall be furnished to the vessel.

(d) The heat-treatment of chains, hooks, rings, links, shackles, and swivels of materials other than wrought iron used as cargo gear, if required, shall be effected in accordance with the manufacturers' instructions.

§ 91.37–60 Additions to gear.

(a) When articles of loose gear and/or wire rope conforming with the requirements in this subpart are added to installed gear, or used as replacements in such gear from time to time, a record shall be maintained on the vessel which shall identify each article and the certificate accompanying it.

§ 91.37–65 Alterations, renewals, or repairs of cargo gear.

(a) Whenever important repairs, renewals, or alterations are indicated or intended for the masts, booms, and permanent fittings of the cargo gear, such repairs, renewals, or alterations shall be undertaken only after compliance with the applicable provisions of § 91.45–1.

(b) Tests and examinations of the repairs, renewals, or alterations shall be in accordance with the provisions of § 91.37–40.

(c) When welding is used to lengthen, alter, or repair chains, rings, hooks, links, shackles, or swivels, they shall be properly heat-treated and shall before being again put into use, be tested and examined in accordance with the provisions of § 91.37–30.

§ 91.37–70 Responsibility of ship's officer for inspection of cargo gear.

(a) All wire rope, chains other than bridle chains attached to booms or masts, and all rings, hooks, links, shackles, swivels and blocks used in loading or unloading shall be visually inspected by a ship's officer designated for that purpose by the master.

(b) These inspections by a ship's officer shall be made at frequent intervals, and in any event not less than once in each month.

(c) Immediately after such an inspection by a ship's officer notations of such an inspection shall be made in record form which shall be in or kept with the cargo gear register if carried. In addition, the same notations of inspections together with the date shall be entered in the Official Logbook for those vessels required to carry this record, or such information shall be kept with the log records maintained on vessels not required to carry the Official Logbook. (See § 91.37–75 for entries required to be kept.)

§ 91.37–75 Records regarding cargo gear.

(a) The cargo gear records described in this subpart shall be maintained on the vessel and shall be made available to Coast Guard officials upon request. These records shall be kept for the periods of time they are valid and, in addition, until the next Coast Guard inspection for certification of the vessel. The certificates of manufacturers and/or testing laboratories, companies, or organizations shall be maintained on the vessel so long as the gear described in such certificates is on board the vessel.

(b) The records of all the inspections of cargo gear made by the ship's officers in accordance with § 91.37–70 shall be maintained on the vessel for periods of time which agree with those periods as covered by the current Coast Guard certificate of inspection issued to the vessel. These records show the dates of inspections, identify articles inspected, the conditions observed, and the name of the officer performing the inspection.

(c) The records of all tests and examinations conducted by or under the supervision of surveyors of the organizations or associations approved by the Commandant shall be maintained on the vessel.

(d) The Coast Guard will not issue cargo gear certificates and/or registers. The Coast Guard's records of inspections, tests, and examinations of a particular vessel's cargo gear made by a

marine inspector or conducted under the supervision of the Coast Guard will be maintained in the office of the Officer in Charge, Marine Inspection, having jurisdiction over the vessel at the time such work was performed. The original certificates or certified copies of certificates of manufacturers and/or testing laboratories, companies, or organizations for loose cargo gear, wire rope, or the annealing of gear shall be maintained on the vessel.

§ 91.37–80 Advance notice that cargo gear testing is desired.

(a) The owner, agent, or master of a vessel shall give an advance notice when it is desired that the tests and examinations of cargo gear be made by or under the supervision of the marine inspector. This advance notice shall be given to the Officer in Charge, Marine Inspection, in whose marine inspection zone the vessel is available for such inspection and examination.

(b) For the initial inspection and examination of cargo gear by the Coast Guard, the advance notice shall be to the cognizant Officer in Charge, Marine Inspection, as early as possible and shall include sketches and/or drawings showing each unit of cargo gear, the identification of component parts and the safe working loads. Copies of original certificates of manufacturers and/or testing laboratories, companies, or organizations maintained on the vessel may be accepted by the cognizant Officer in Charge, Marine Inspection, when satisfied such certificates properly describe the qualities of the component parts of the gear in question.

§ 91.37–85 Responsibility for conducting required tests and examinations.

(a) The vessel's owners and/or operators shall furnish and pay the expenses required in conducting the tests and examinations prescribed by the regulations in this subpart, including the supplying of all instruments, other equipment, and personnel including personnel supervision for performance of all work required.

(b) The Coast Guard's participation in these required tests and examinations shall be confined to witnessing required tests and examinations with the view to determining whether or not the gear is satisfactory for the purpose intended. In the event it is determined that the gear is defective or unable to meet the standards set forth in this subpart such gear, or portions thereof, shall be replaced to the satisfaction of the Officer in Charge, Marine Inspection, having jurisdiction over the vessel.

Subpart 91.40—Drydocking

§ 91.40–1 When required.

(a) Except for extensions as authorized by the Commandant, all vessels shall be placed in drydock or hauled out for examination within the periods set forth in this paragraph, depending upon the service.

(1) Each vessel should be drydocked or hauled out at intervals not to exceed 18 months if it operates in salt water an aggregate of more than 9 months in the 18-month period since it was last drydocked or hauled out.

(2) Each vessel shall be drydocked or hauled out at intervals not to exceed 36 months if it operates in salt water an aggregate of more than 3 months but not more than 6 months in each 12-month period since it was last drydocked or hauled out. When a vessel exceeds an aggregate of 6 months service in salt water in any 12-month period since it was last drydocked or hauled out, it shall be drydocked or hauled out within 6 months after the end of that period or within the 36-month interval, whichever is earlier.

(3) Each vessel shall be drydocked or hauled out at intervals of 48 months if it operates in salt water an aggregate of more than one month but not more than 3 months in each 12-month period since it was last drydocked or hauled out.

(4) Each vessel shall be drydocked or hauled out at intervals not to exceed 60 months if it operates in salt water an aggregate not exceeding one month in each 12-month period since it was last drydocked or hauled out.

§ 91.40–5 Notice by owner.

(a) The master, owner, or agent shall notify the Officer in Charge, Marine Inspection, when any vessel is to be placed on a drydock in order that an examination of the underwater portion of the vessel may be made if deemed necessary.

Subpart 91.45—Repairs and Alterations

§ 91.45–1 Notice required.

(a) No repairs or alterations affecting the safety of the vessel with regard to the hull, machinery, or equipment, shall be made without the knowledge of the Officer in Charge, Marine Inspection.

(b) Drawings of alterations shall be approved before work is started unless deemed unnecessary by the Officer in Charge, Marine Inspection.

(c) Drawings will not be required for repairs in kind.

§ 91.45–5 Inspection required.

(a) An inspection either general or partial depending upon the circumstances shall be made whenever any important repairs or alterations are undertaken.

Subpart 91.50—Special Operating Requirements

§ 91.50–1 Inspection and testing required when making alterations, repairs, or other such operations involving riveting, welding, burning or like fire-producing actions.

(a) The provisions of "Standard for the Control of Gas Hazards on Vessels to be Repaired," NFPA No. 306, published by National Fire Protection Association, 60 Batterymarch Street, Boston, Mass., 02110, shall be used as a guide in conducting the inspections and issuance of certificates required by this section.

(b) Until an inspection has been made to determine that such operation can be undertaken with safety, no alterations, repairs, or other such operations involving riveting, welding, burning, or like fire-producing actions shall be made:

(1) Within or on the boundaries of cargo tanks which have been used to carry combustible liquids or chemicals in bulk; or,

(2) Within spaces adjacent to cargo tanks which have been used to carry Grade D combustible liquid cargo, except where the distance between such cargo tanks and the work to be performed is not less than twenty-five (25) feet; or,

(3) Within or on the boundaries of fuel tanks; or,

(4) To pipelines, heating coils, pumps, fittings, or other appurtenances connected to such cargo or fuel tanks; or,

(5) On miscellaneous vessels such as cable, salvage, pile driving, and oil drilling rig vessels that have been specially authorized to carry Grade B or Grade C flammable liquid cargo in bulk by the Commandant, within or on the boundaries of such cargo tanks or within spaces adjacent to such cargo tanks.

(c) Such inspections shall be made and evidenced as follows:

(1) In ports or places in the United States or its territories and possessions the inspection shall be made by a marine chemist certificated by the National Fire Protection Association; however, if the services of such certified marine chemist are not reasonably available, the Officer in Charge, Marine Inspection, upon the recommendation of the vessel owner and his contractor or their representative, shall select a person who, in the case of an individual vessel, shall be authorized to make such inspection. If the inspection indicates that such operations can be undertaken with safety, a certificate setting forth the fact in writing and qualified as may be required, shall be issued by the certified marine chemist or the authorized person before the work is started. Such qualifications shall include any requirements as may be deemed necessary to maintain, insofar as can reasonably be done, the safe conditions in the spaces certified throughout the operation and shall include such additional tests and certifications as considered required. Such qualifications and requirements shall include precautions necessary to eliminate or minimize hazards that may be present from protective coatings or residues from cargoes.

(2) When not in such a port or place, and a marine chemist or such person authorized by the Officer in Charge, Marine Inspection, is not reasonably available, the inspection shall be made by the senior officer present and a proper entry shall be made in the vessel's logbook.

(d) It shall be the responsibility of the senior officer present to secure copies of certificates issued by the certified marine chemist or such person authorized by the Officer in Charge, Marine Inspection. It shall be the responsibility of the senior officer present, insofar as the persons under his control are concerned, to maintain a safe condition on the vessel by full observance of all qualifications and requirements listed by the marine chemist in the certificate.

Subpart 91.55—Plan Approval

AUTHORITY: The provisions of this Subpart 91.55 interpret or apply R.S. 4490, as amended, sec. 3, 24 Stat. 129, as amended; 46 U.S.C. 482, 483.

§ 91.55–1 General.

(a) The following list of required plans is general in character, but includes all plans which normally show construction and safety features coming under the cognizance of the Coast Guard. In the case of a particular vessel, all of the plans enumerated may not be applicable, and it is intended that only those plans and specifications be submitted as will clearly show the vessel's arrangement, construction and required equipment.

(b) In the following list of required plans, the items which must be approved by the American Bureau of Shipping for vessels classed by that organization are indicated by an asterisk. When prints bearing record of such approval by the American Bureau of Shipping are forwarded to the Coast Guard they will in general be accepted as satisfactory except insofar as the law or the Coast Guard regulations contain requirements which are not covered by the American Bureau of Shipping.

§ 91.55–5 Plans and specifications required for new construction.

(a) *General.* (1) Specifications.

(2) General Arrangement Plan of decks, holds, inner bottoms, etc., and including inboard and outboard profile.

(b) *Hull structure.*[1] (1) *Inner Bottom Plating and Framing.

(2) *Midship Section.

(3) *Shell Plating and Framing.

(4) *Stem, Stern Frame, and Rudder.

(5) *Structural Deck Plans for Strength Decks.

(6) *Pillars and Girders.

(7) *Watertight and Oiltight Bulkheads.

(8) *Foundations for Main Machinery and Boilers.

(9) *Arrangement of Ports, Doors, and Airports in Shell Plating.

(10) *Hatch Coamings and Covers in Weather and Watertight Decks.

(11) *Details of Watertight Doors and Operating Gear.

(12) *Scuppers and Drains Penetrating Shell Plating.

(13) *Arrangement of the cargo gear including a stress diagram. The principal details of the gear and the safe working load for each component part shall be shown.

(c) *Hull calculations, etc.* Required only when a stability test is to be performed.

(1) Lines (for information).

(2) Curves of Form.

(3) Capacity Plan showing capacities and vertical and longitudinal centers of gravity of cargo spaces, tanks, etc. (for information).

(4) Tank Sounding tables (for information).

(5) Draft Mark Locations (for information).

(d) *Fire control.* (1) General arrangement plans showing for each deck the control stations, the various fire sections enclosed by fire resisting bulkheads, the arrangement of the alarm and extinguishing systems, the fire extinguishers, means of access to different compartments and decks and the ventilation system including location of ventilation shutdowns, positions of dampers and the numbers identifying each system.

(2) Ventilation diagram including dampers and other fire control features.

(3) Details of alarm systems.

(4) Details of extinguishing systems, including fire mains, carbon dioxide, foam and sprinkling systems.

(e) *Marine engineering.* For plans required for marine engineering equipment and systems, see Subchapter F (Marine Engineering) of this chapter.

(f) *Electrical engineering.* For plans required for electrical engineering, equipment and systems, see Subchapter J (Electrical Engineering) of this chapter.

(g) *Lifesaving equipment.* (1) These plans are to show the location and arrangement of embarkation decks, all overboard discharges and projections in way of launching lifeboats, weights of lifeboats fully equipped and loaded, working loads of davits and winches, types and sizes of falls, the manufacturer's name and identification for all equipment, and all other relevant and necessary information.

(i) Arrangement of lifeboats.

(ii) Arrangement of davits.

(iii) Location and stowage of liferafts and buoyant apparatus.

(h) *Crew's accommodations.* (1) Arrangement plans showing accommodations, ventilation, escapes, hospital, and sanitary facilities for all crewmembers.

§ 91.55-10 Plans required for alterations of existing vessels.

(a) In the event of alterations involving the safety of the vessel, the applicable plans shall be submitted for approval covering the proposed work except as modified by § 91.45–1. The general scope of the plans shall be as noted in § 91.55–5.

§ 91.55–15 Procedure for submittal of plans.

(a) As the relative location of shipyards, design offices, and Coast Guard offices vary throughout the country, no specific routing will be required in the submittal of plans. In general, one of the following procedures would apply, but in a particular case, if a more expeditious procedure can be used, there will be no objection to its adoption.

(1) The plans may be submitted to the Officer in Charge, Marine Inspection, in the district in which the vessel is to be built. This procedure will be most expeditious in the case of those offices where personnel and facilities are available for examination and approval of the plans locally.

(2) The plans may be submitted directly to the Commandant (MMT), U. S. Coast Guard, 1300 "E" Street NW., Washington, D.C., 20226. In this case, the plans will be returned directly to the submitter, with a copy of the action being forwarded to the interested Officer in Charge, Marine Inspection.

(3) The plans may be submitted directly to field technical offices.

(i) Commander, 3d Coast Guard District (mmt), 45 Broadway, New York, N.Y., 10006, for the geographical area covered by 1st, 3d and 5th Coast Guard Districts.

(ii) Commander, 8th Coast Guard District (mmt), Room 308, Customhouse, New Orleans, La., 70130, for geographical area covered by 2d, 7th and 8th Coast Guard Districts.

(iii) Commander, 12th Coast Guard District (mmt), 630 Sansome St., San Francisco, Calif., 94501, for geographical area covered by 11th, 12th, 13th, 14th and 17th Coast Guard Districts.

(4) In the case of classed vessels, upon specific request by the submitter, the American Bureau of Shipping will arrange to forward the necessary plans to the Coast Guard indicating its action thereon. In this case, the plans will be returned as noted in subparagraph (2) of this paragraph.

§ 91.55–20 Number of plans required.

(a) Four copies of each plan are normally required so that one can be returned to the submitter. If the submitter desires additional approved plans, a suitable number should be submitted to permit the required distribution.

Subpart 91.60—Certificates Under International Convention for Safety of Life at Sea, 1960

§ 91.60–1 Application.

(a) The provisions of this subpart, with the exception of §§ 91.60–30 and 91.60–40(e), shall apply to all cargo vessels on an international voyage other than nuclear vessels.

(b) The provisions of §§ 91.60–30, 91.60–35 and 91.60–40(e) shall apply to all nuclear cargo vessels on an international voyage.

§ 91.60–5 Cargo Ship Safety Construction Certificate.

(a) All vessels on an international voyage are required to have a Cargo Ship Safety Construction Certificate. This certificate shall be issued by the U.S. Coast Guard or the American Bureau of Shipping to certain vessels on behalf of the United States of America as provided in Regulation 12, Chapter I, of the International Convention for Safety of Life at Sea, 1960.

(b) All such vessels shall meet the applicable requirements of this chapter for vessels on an international voyage.

§ 91.60–10 Cargo Ship Safety Equipment Certificate.

(a) All vessels on an international voyage are required to have a Cargo Ship Safety Equipment Certificate.

[1] The asterisk (*) indicates items which may require approval by the American Bureau of Shipping for vessels classed by that society.

(b) All such vessels shall meet the applicable requirements of this chapter for vessels on an international voyage.

§ 91.60–15 Cargo Ship Safety Radiotelegraphy Certificate.

(a) The application for Cargo Ship Safety Radiotelegraphy Certificate is made on FCC Form 801 to the local office of the Federal Communications Commission.

(b) Where applicable, a Cargo Ship Safety Radiotelegraphy Certificate will be issued by the Federal Communications Commission to a vessel meeting its requirements for a vessel fitted with a radiotelegraph installation.

§ 91.60–20 Cargo Ship Safety Radiotelephony Certificate.

(a) The application for a Cargo Ship Safety Radiotelephony Certificate is made on FCC Form 801 to the local office of the Federal Communications Commission.

(b) Where applicable, a Cargo Ship Safety Radiotelephony Certificate will be issued by the Federal Communications Commission to a vessel meeting its applicable requirements for a vessel fitted with a radiotelephone installation.

§ 91.60–25 Exemption Certificate.

(a) A vessel may be exempted by the Commandant from complying with certain requirements of the Convention under his administration upon request made in writing to him and transmitted via the Officer in Charge, Marine Inspection.

(b) When an exemption is granted to a vessel by the Commandant under and in accordance with the Convention, an Exemption Certificate describing such exemption shall be issued through the appropriate Officer in Charge, Marine Inspection, in addition to other required certificates.

§ 91.60–30 Nuclear Cargo Ship Safety Certificate.

(a) All nuclear cargo vessels on an international voyage are required to have a Nuclear Cargo Ship Safety Certificate.

(b) All such vessels shall meet the applicable requirements of this chapter for nuclear vessels on an international voyage.

(c) Nuclear vessels cannot be exempted from any requirements of the Convention.

§ 91.60–35 Posting of Convention certificates.

(a) The certificates described in this subpart, or certified copies thereof, when issued to a vessel shall be posted in a prominent and accessible place on the vessel.

(b) The certificates shall be carried in a manner similar to that described in § 91.01–5 for a certificate of inspection.

§ 91.60–40 Duration of certificates.

(a) A Cargo Ship Safety Equipment Certificate shall be issued for a period of not more than 24 months.

(b) A Cargo Ship Safety Construction Certificate shall be issued for a period of not more than 60 months.

(c) A Cargo Ship Safety Radiotelegraphy Certificate and a Cargo Ship Safety Radiotelephony Certificate shall be issued for a period of not more than 12 months.

(d) An Exemption Certificate shall not be valid for longer than the period of the certificate to which it refers.

(e) The Nuclear Cargo Ship Safety Certificate shall be issued for a period of not more than 12 months.

(f) A Convention certificate may be withdrawn, revoked, or suspended at any time when it is determined the vessel is no longer in compliance with applicable requirements. (See § 2.01–70 of this chapter for procedures governing appeals.)

§ 91.60–45 American Bureau of Shipping.

(a) The American Bureau of Shipping, with its home office at 45 Broad Street, New York, N.Y., 10004, is hereby designated as an organization duly authorized to issue the "Cargo Ship Safety Construction Certificate" to certain cargo ships on behalf of the United States of America as provided in Regulation 12, Chapter I, of the International Convention for Safety of Life at Sea, 1960, and Executive Order 11239 and the certificate shall be subject to the requirements in this subpart. The American Bureau of Shipping is authorized to place the official seal of the United States of America on the certificate. This designation and delegation to the American Bureau of Shipping shall be in effect from May 26, 1965, until terminated by proper authority and notice of cancellation is published in the FEDERAL REGISTER.

(b) At the option of the owner or agent of a vessel on an international voyage and on direct application to the American Bureau of Shipping, the Bureau may issue to such vessel a Cargo Ship Safety Construction Certificate, having a period of validity of not more than 60 months after ascertaining that the vessel:

(1) Has met the applicable requirements of the Convention; and,

(2) Is currently classed by the Bureau and classification requirements have been dealt with to the satisfaction of the Bureau.

(c) When the Bureau determines that a vessel to which it has issued a Cargo Ship Safety Construction Certificate no longer complies with the Bureau's applicable requirements for classification, the Bureau shall immediately furnish to the Coast Guard all relevant information, which will be used by the Coast Guard to determine whether or not to withdraw, revoke or suspend the Cargo Ship Safety Construction Certificate.

(Sec. 25, 41 Stat. 998, as amended, sec. 701, 62 Stat. 731, as amended; 46 U.S.C. 881, 18 U.S.C. 701)

PART 92—CONSTRUCTION AND ARRANGEMENT

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AUTHORITY: The provisions of this Part 92 issued under R.S. 4405, as amended, 4462, as amended; 46 U.S.C. 375, 416. Interpret or apply R.S. 4417, as amended, 4418, as amended, 4426, as amended, 4488, as amended, 4490, as amended, sec. 10, 35 Stat. 428, as amended, 41 Stat. 305, as amended, secs. 1, 2, 49 Stat.

1544, 1545, as amended, sec. 3, 68 Stat. 675; 46 U.S.C. 391, 392, 404, 481, 482, 395, 363, 367, 50 U.S.C. 198; E.O. 11239, July 31, 1965, 30 F.R. 9671, 3 CFR, 1965 Supp. Treasury Department Orders 120, July 31, 1950, 15 F.R. 6521; 167-14, Nov. 26, 1954, 19 F.R. 8026; CGFR 56-28, July 24, 1956, 21 F.R. 5659; 167-38, Oct. 26, 1959, 24 F.R. 8857, unless otherwise noted.

Subpart 92.01—Hull Structure

§ 92.01-1 Application.

(a) The provisions of this subpart, with the exception of § 92.01-90, shall apply to all vessels contracted for on or after November 19, 1952. Vessels contracted for prior to November 19, 1952, shall meet the requirements of § 92.01-90.

§ 92.01-5 Vessels subject to load line.

(a) For vessels assigned a load line, see Subchapter E (Load Lines) of this chapter, for special requirements as to strength, closure of openings, etc.

(Sec. 2, 45 Stat. 1493, as amended, sec. 2, 49 Stat. 888, as amended; 46 U.S.C. 85a, 88a. Treasury Department Order 167-48, Oct. 19, 1962, 27 F.R. 10504)

§ 92.01-10 Structural standards.

(a) In general, compliance with the standards established by the American Bureau of Shipping, see Subpart 90.35 of this subchapter, will be considered as satisfactory evidence of the structural efficiency of the vessel. However, in special cases, a detailed analysis of the entire structure or some integral part may be made by the Coast Guard to determine the structural requirements.

§ 92.01-13 Sliding watertight doors.

(a) Sliding watertight doors, where fitted, shall be designed, tested, and installed in accordance with Subpart 163.001 of Subchapter Q (Specifications) of this chapter.

§ 92.01-15 Special consideration.

(a) Special consideration will be given to the structural requirements for small vessels or vessels of an unusual design not contemplated by the rules of the American Bureau of Shipping.

§ 92.01-90 Vessels contracted for prior to November 19, 1952.

(a) Existing structure previously approved will be considered satisfactory so long as it is maintained in good condition to the satisfaction of the Officer in Charge, Marine Inspection. Minor repairs and alterations may be made to the same standard as the original construction.

Subpart 92.05—General Fire Protection

§ 92.05-1 Fire hazards to be minimized.

(a) The general construction of the vessel shall be such as to minimize fire hazards insofar as is reasonable and practicable.

§ 92.05-5 Woodwork insulated from heated surfaces.

(a) Internal combustion engine exhausts, boiler and galley uptakes, and similar sources of ignition shall be kept clear of and suitably insulated from any woodwork or other combustible matter.

§ 92.05-10 Lamp room construction.

(a) Lamp, paint, and oil lockers and similar compartments shall be constructed of steel or shall be wholly lined with metal.

§ 92.05-15 Segregation of spaces containing the emergency source of electric power.

(a) The provisions of this section shall apply to all vessels contracted for on or after October 1, 1958.

(b) When a compartment containing the emergency source of electric power, or vital components thereof, adjoins a space containing either the ship's service generators or machinery necessary for the operation of the ship's service generators, all common bulkheads and/or decks shall be protected by approved "structural insulation" or other approved material. This protection shall be such as to be capable of preventing an excessive temperature rise in the space containing the emergency source of electric power, or vital components thereof, for a period of at least one hour in the event of fire in the adjoining space. Bulkheads or decks meeting Class A-60 requirements, as defined by § 72.05-10 of Subchapter H (Passenger Vessels) of this chapter, will be considered as meeting the requirements of this paragraph.

Subpart 92.07—Structural Fire Protection

§ 92.07-1 Application.

(a) The provisions of this subpart, with the exception of § 92.07-90, shall apply to all vessels of 4,000 gross tons and over contracted for on or after January 1, 1962. Such vessels contracted for prior to January 1, 1962, shall meet the requirements of § 92.07-90.

§ 92.07-5 Definitions.

(a) *Standard fire test.* A "standard fire test" is one which develops in the test furnace a series of time temperature relationships as follows:

5 minutes—1,000° F.
10 minutes—1,300° F.
30 minutes—1,550° F.
60 minutes—1,700° F.

(b) *"A" Class divisions.* Bulkheads or decks of the "A" Class shall be composed of steel or equivalent metal construction, suitably stiffened and made intact with the main structure of the vessel; such as shell, structural bulkheads, and decks. They shall be so constructed, that if subjected to the standard fire test, they would be capable of preventing the passage of flame and smoke for one hour.

(c) *"B" Class bulkheads.* Bulkheads of the "B" Class shall be constructed with approved incombustible materials and made intact from deck to deck and to shell or other boundaries. They shall be so constructed that, if subjected to the standard fire test, they would be capable of preventing the passage of flame and smoke for one half hour.

(d) *"C" Class divisions.* Bulkheads or decks of the "C" Class shall be constructed of approved incombustible materials, but need meet no requirements relative to the passage of flame.

(e) *Steel or other equivalent metal.* Where the term "steel or other equivalent metal" is used in this subpart, it is intended to require a material which, by itself or due to insulation provided, has structural and integrity qualities equivalent to steel at the end of the applicable fire exposure.

(f) *Approved material.* Where in this subpart approved materials are required, they refer to materials approved under the applicable subparts of Subchapter Q (Specifications) of this chapter, as follows:

Deck Coverings	164.006
Structural Insulations	164.007
Bulkhead Panels	164.008
Incombustible Materials	164.009
Interior Finishes	164.012

§ 92.07-10 Construction.

(a) The hull, superstructure, structural bulkheads, decks, and deckhouses shall be constructed of steel. Alternately, the Commandant may permit the use of other suitable material in special cases, having in mind the risk of fire.

(b) Bulkheads of galleys, paint and lamp lockers, and emergency generator rooms shall be of "A" Class construction.

(c) The boundary bulkheads and decks separating the accommodations and control stations from cargo and machinery spaces, galleys, main pantries and storerooms, other than small service lockers, shall be of "A" Class construction.

(d) Within the accommodation and service areas the following conditions shall apply:

(1) Corridor bulkheads in accommodation spaces shall be of the "A" or "B" Class intact from deck to deck. Stateroom doors in such bulkheads may have a louver in the lower half.

(2) Elevator, dumbwaiter, and other trunks shall be of "A" Class construction.

(3) Bulkheads not already specified to be of "A" or "B" Class construction may be of "A", "B", or "C" Class construction.

(4) The integrity of any deck in way of a stairway opening shall be maintained by means of "A" or "B" class bulkheads and doors at one level. The doors shall be of self-closing type. Holdback hooks will not be permitted. However, magnetic holdbacks operated from the bridge or from other suitable remote control positions are acceptable.

(5) Interior stairs, including stringers and treads, shall be of steel.

(6) Except for washrooms and toilet spaces, deck coverings within accommodation spaces shall be of an approved type. However, overlays for leveling or finishing purposes which do not meet the requirements for an approved deck covering may be used in thicknesses not exceeding 3/8 of an inch.

(7) Ceilings, linings, and insulation, including pipe and duct laggings, shall be of approved incombustible materials.

(8) Any sheathing, furring or holding pieces incidental to the securing of any bulkhead, ceiling, lining, or insulation shall be of approved incombustible materials.

(9) Combustible veneers, trim, decorations, etc. shall not be used in corridors or hidden spaces. This is not intended to preclude the use of an approved Interior Finish or a reasonable number of coats of paint.

(e) Wood hatch covers may be used between cargo spaces or between stores spaces. Hatch covers in other locations shall be of steel or equivalent metal construction. Tonnage openings shall be closed by means of steel plates.

(f) Nitrocellulose or other highly flammable or noxious fume-producing paints or lacquers shall not be used.

§ 92.07–90 Vessels contracted for prior to January 1, 1962.

(a) Existing structure arrangements and materials previously approved will be considered satisfactory so long as they are maintained in good condition to the satisfaction of the Officer in Charge, Marine Inspection. Minor repairs and alterations may be made to the same standard as the original construction.

Subpart 92.10—Means of Escape

§ 92.10–1 Application.

(a) The provisions of this subpart, with the exception of § 92.10–90, shall apply to all vessels contracted for on or after November 19, 1952. Vessels contracted for prior to November 19, 1952, shall meet the requirements of § 92.10–90.

§ 92.10–5 Two means required.

(a) There shall be at least two means of escape from all general areas accessible to the passengers, if carried, or where the crew may be quartered or normally employed. At least one of these two means of escape shall be independent of watertight doors.

§ 92.10–10 Location.

(a) The two means of escape shall be as remote as practicable so as to minimize the possibility of one incident blocking both escapes.

§ 92.10–15 Vertical ladders not accepted.

(a) Vertical ladders and deck scuttles shall not in general be considered satisfactory as one of the required means of escape. However, where it is demonstrated that the installation of a stairway would be impracticable, a vertical ladder may be used as the second means of escape.

§ 92.10–20 No means for locking doors.

(a) No means shall be provided for locking doors giving access to either of the two required means of escape, except that crash doors or locking devices, capable of being easily forced in an emergency, may be employed provided a permanent and conspicuous notice to this effect is attached to both sides of the door. This paragraph shall not apply to outside doors to deckhouses where such doors are locked by key only and such key is under the control of one of the vessel's officers.

§ 92.10–25 Stairway size.

(a) Stairways shall be of sufficient width having in mind the number of persons having access to such stairs for escape purposes.

(b) Vessels contracted for on or after January 1, 1959, shall meet the requirements of this paragraph. Special consideration for relief may be given in the case of small vessels if it is shown to be unreasonable or impracticable to meet the requirements.

(1) All interior stairways, other than those within the machinery spaces or cargo holds, shall have a minimum width of 28 inches. The angle of inclination with the horizontal of such stairways shall not exceed 50 degrees.

§ 92.10–30 Dead end corridors.

(a) Dead end corridors, or the equivalent, more than 40 feet in length shall not be permitted.

§ 92.10–35 Public spaces.

(a) In all cases, public spaces having a deck area of over 300 square feet shall have at least two exits. Where practicable, these exits shall give egress to different corridors, rooms, or spaces to minimize the possibility of one incident blocking both exits.

§ 92.10–40 Access to lifeboats.

(a) The stairways, corridors, and doors shall be so arranged as to permit a ready and direct access to the various lifeboat embarkation areas.

§ 92.10–45 Weather deck communications.

(a) Vertical communication shall be provided between the various weather decks by means of permanent inclined ladders.

§ 92.10–90 Vessels contracted for prior to November 19, 1952.

(a) Existing arrangements previously approved will be considered satisfactory so long as they are maintained in good condition to the satisfaction of the Officer in Charge, Marine Inspection. Minor repairs and alterations may be made to the same standards as the original design: *Provided*, That in no case will a greater departure from the standards of §§ 92.10–5 through 92.10–45 be permitted than presently exists. Nothing in this paragraph shall be construed as exempting any vessel from having 2 means of escape from all main compartments which are accessible to the passengers, if carried, or where the crew are normally quartered or employed.

Subpart 92.15—Ventilation

§ 92.15–1 Application.

The provisions of this subpart, with the exception of § 92.15–90, shall apply to all vessels contracted for on or after November 19, 1952. Vessels contracted for prior to November 19, 1952, shall meet the requirements of § 92.15–90.

§ 92.15–5 Vessels using fuel having a flashpoint of 110 degrees or lower.

(a) Where liquid fuel having a flashpoint of 110 degrees F. or lower is used for main or auxiliary machinery or for starting purposes, the spaces containing such machinery or fuel tanks shall have ventilation as required by this section.

(1) At least 2 ventilators fitted with cowls or their equivalent for the purpose of properly and effectively ventilating the bilges of every engine and fuel-tank compartment in order to remove any flammable or explosive gases.

(2) Vessels constructed so that the greater portions of the bilges under the engine and fuel tanks are open or exposed to the natural atmosphere at all times are not required to be fitted with ventilators.

§ 92.15–10 Ventilation for closed spaces.

(a) Except as noted in paragraph (c) of this section, all enclosed spaces within the vessel shall be properly vented or ventilated. Means shall be provided to close off all vents and ventilators.

(b) Means shall be provided for stopping all fans in ventilation systems serving machinery and cargo spaces and for closing all doorways, ventilators and annular spaces around funnels and other openings to such spaces, from outside these spaces, in case of fire.

(c) On unmanned cargo barges not fitted with a fixed bilge system, vents and ventilators may be omitted from void spaces.

§ 92.15–15 Ventilation for crew quarters and, where provided, passenger spaces.

(a) All living spaces shall be adequately ventilated in a manner suitable to the purpose of the space.

(b) On vessels of 100 gross tons and over, except for such spaces as are so located that under all ordinary conditions of weather, windows, ports, skylights, etc., and doors to passageways can be kept open, all crew spaces shall be ventilated by a mechanical system, unless it can be shown that a natural system will provide adequate ventilation. However, vessels which trade regularly in the tropics shall, in general, be fitted with a mechanical ventilation system.

§ 92.15–90 Vessels contracted for prior to November 19, 1952.

(a) Existing arrangements previously approved will be considered satisfactory so long as they are maintained in good condition to the satisfaction of the Officer in Charge, Marine Inspection. Minor repairs and alterations may be made to the same standards as the original design provided that in no case will a greater departure from the standards of §§ 92.15–5 through 92.15–15 be permitted than presently exists.

Subpart 92.20—Accommodations for Officers and Crew

§ 92.20–1 Application.

(a) The provisions of this subpart, with the exception of § 92.20–90, shall apply to all vessels of 100 gross tons and

over contracted for on or after November 19, 1952. Vessels of 100 gross tons and over contracted for prior to November 19, 1952, shall meet the requirements of § 92.20–90.

(b) Vessels of less than 100 gross tons shall meet the applicable requirements of this subpart insofar as is reasonable and practicable.

§ 92.20–5 Intent.

(a) It is the intent of this subpart that the accommodations provided for officers and crew on all vessels shall be securely constructed, properly lighted, heated, drained, ventilated, equipped, located, arranged, and, where practicable, shall be insulated from undue noise and effluvia.

(b) The crew referred to herein includes all persons, except the licensed officers, regularly employed on board any vessel. Where the requirements for the accommodation of licensed officers are not otherwise specified, they shall be of at least equivalent to that indicated herein for the crew.

(c) For the purpose of this subpart, the term "crew spaces" shall include sleeping rooms, messrooms, recreational rooms, toilet and shower spaces, etc., which are intended for the exclusive use of the crew.

§ 92.20–10 Location of crew spaces.

(a) Crew spaces shall be located, where practicable, so that the maximum amount of fresh air and light are obtainable, having due regard to the service of the vessel and the requirements of other space users.

(b) Crew quarters shall not be located farther forward in a vessel than a vertical plane located at 5 percent of the vessel's length abaft the forward side of the stem at the designed summer load waterline. However, for vessels in other than ocean or coastwise service, this distance need not exceed 28 feet. For the purpose of this paragraph, the length shall be as defined in § 43.15–1 of Subchapter E (Load Lines) of this chapter. No section of the deck of the crew spaces shall be below the deepest load line, except that in special cases, the Commandant may approve such an arrangement: *Provided*, That in no case shall the deck head of the crew space be below the deepest load line.

(c) Hawse pipes or chain pipes shall not pass through crew spaces.

(d) There shall be no direct communication, except through solid, close fitted doors or hatches between crew spaces and chain lockers, cargo, or machinery spaces.

(e) There shall be no access, vents, or sounding tubes from fuel or cargo oil tanks opening into crew spaces, except that sounding tubes and access openings may be located in corridors.

(f) Where practicable, crew spaces shall be located entirely separate and independent of spaces allotted to passengers or licensed officers.

§ 92.20–15 Construction.

(a) All crew spaces are to be constructed in a manner suitable to the purpose for which they are intended. The bulkheads separating the crew space from cargo and machinery spaces, lamp and paint rooms, storerooms, drying rooms, washrooms, and toilet spaces shall be made odorproof where deemed necessary by the Commandant.

(b) Toilet spaces, except when provided as private or semiprivate facilities, shall be so built, fitted, and situated, that no odor from them will readily enter other crew spaces.

(c) Where shell or unsheathed weather decks form boundaries of crew spaces, suitable protective coverings shall be applied to prevent formation or accumulation of moisture.

(d) Where crew spaces adjoin or are immediately above spaces such as galleys, machinery spaces or casings, donkey boilerrooms, etc., they shall be suitably protected from the heat.

(e) The interior sides and deckheads of crew spaces shall be covered with enamel, paint, or other material light in color.

(f) Crew spaces shall be properly drained where considered necessary.

(g) All washrooms and toilet rooms shall be properly drained and so constructed and arranged that they can be kept in a clean, workable, and sanitary condition. The scuppers shall be located in the lowest part of the space, due consideration being given to the average trim of the vessel.

§ 92.20–20 Sleeping accommodations.

(a) *Arrangements.* (1) Separate sleeping accommodations are to be provided for the deck, engine, and steward groups of the crew.

(2) Each watch of seamen, firemen or similar ratings on duty in watches is to be provided with separate sleeping room or rooms, unless the total space for accommodations makes this impracticable.

(3) Where practicable, each licensed officer shall be provided with a separate stateroom.

(b) *Size.* (1) Sleeping accommodations for the crew shall be divided into rooms, no one of which shall berth more than four persons.

(2) Each room shall be of such size that there are at least 30 square feet of deck area and a volume of at least 210 cubic feet for each person accommodated. The clear headroom shall be not less than 6 feet 3 inches. In measuring sleeping quarters allocated to crews of vessels, any equipment contained therein for the use of the occupants is not to be deducted from the total volume or from the deck area.

(c) *Equipment.* (1) Each person shall have a separate berth and not more than one berth shall be placed above another. The berths shall have a framework of metal or other hard, smooth material not likely to corrode or harbor vermin, and shall be so arranged that they provide ample room for easy occupancy. The overall size of a berth shall not be less than 30 inches wide by 76 inches long, except by special permission of the Commandant. Where berths adjoin, they shall be divided by a partition not less than 18 inches in height. Where two tiers of berths are fitted, the bottom of the lower must not be less than 12 inches above the deck, and the bottom of the upper must not be less than 2 feet 6 inches both from the bottom of the lower and from the deck overhead. The berths shall not be obstructed by pipes, ventilating ducts, or other installations.

(2) A locker of metal or other hard, smooth material shall be provided for each person accommodated in a room. Each locker shall be not less than 300 square inches in cross section area and 60 inches high. It shall be so placed as to be readily accessible. The interior of the locker shall be so arranged as to facilitate the proper stowage of clothes.

§ 92.20–25 Washrooms and toilet rooms.

(a) There shall be provided at least one toilet, one washbasin, and one shower or bathtub for each eight members or portion thereof in the crew to be accommodated. The crew to be accommodated shall include all members who do not occupy rooms to which private or semiprivate facilities are attached.

(b) Under the following conditions, the toilet and washing facilities for the specific groups of the crew indicated shall be located in spaces separate from the facilities for other crew members; and shall be provided for that group in the ratios required by paragraph (a) of this section.

(1) The members of the engine department, where their number, exclusive of licensed officers, and others separately provided for, exceeds eight.

(2) The members of the steward's department, exclusive of those separately provided for, where their number exceeds eight.

(3) All female members of the crew.

(c) The toilet rooms and washrooms shall be located convenient to the sleeping quarters of the crew to which they are allotted but shall not open directly into such quarters except when they are provided as private or semiprivate facilities.

(d) All washbasins, showers, and bathtubs shall be equipped with proper plumbing, including hot and cold running water. Washbasins may be located in the crew sleeping quarters.

(e) The toilet rooms shall be separate from the washrooms and at least one washbasin shall be fitted in each toilet room, except where private or semiprivate facilities are provided and washbasins are installed in the sleeping rooms.

(f) All toilets shall be installed with proper plumbing for flushing. Toilets shall be provided with seats of the open front type. Urinals may be fitted in toilet rooms, if desired, but no reduction in the required number of toilets will be made therefore.

(g) Where more than one toilet is located in a space or compartment, each toilet shall be separated by partitions, which shall be open at the top and bottom for ventilation and cleaning purposes.

§ 92.20–30 Messrooms.

(a) Messrooms shall be located as near to the galley or suitably equipped serving pantry as is practicable, except where messroom is equipped with a steam table. The mess rooms shall be of such size as to seat the number of persons normally scheduled to be eating at one time.

(b) Messrooms shall be properly equipped with tables, seats, and other necessary equipment and shall be so arranged as to permit access to each seat.

§ 92.20–35 Hospital space.

(a) Each vessel, which in the ordinary course of its trade makes voyages of more than three days duration between ports and which carries a crew of twelve or more, shall be provided with a hospital space. This space shall be situated with due regard to the comfort of the sick so that they may receive proper attention in all weathers.

(b) The hospital shall be suitably separated from other spaces and shall be used for the care of the sick and for no other purpose.

(c) The entrance shall be of such width and in such a position as to admit a stretcher case readily. Berths shall be of metal and may be in double tier, provided the upper berth is hinged and arranged to be secured clear of the lower berth when not in use. At least one berth shall be so arranged that it can be made accessible from both sides when necessary.

(d) The hospital shall be fitted with berths in the ratio of one berth to every twelve members of the crew or portion thereof who are not berthed in single occupancy rooms, but the number of berths need not exceed six.

(e) The hospital shall have a toilet, washbasin, and bath tub or shower conveniently situated. Other necessary suitable equipment of such character as clothes locker, table, seat, etc., shall be provided.

§ 92.20–40 Other spaces.

(a) Sufficient facilities, depending upon the number of the crew, shall be provided where the crew may wash their own clothes. There shall be at least one tub or sink, fitted with the necessary plumbing, including hot and cold running water.

(b) Clothes drying facilities or space shall be provided for the needs of the crew.

(c) Recreation accommodations shall be provided. Where messrooms are used for this purpose, they shall be suitably planned.

§ 92.20–45 Lighting.

(a) All crew spaces shall be adequately lighted in accordance with the requirements of Subchapter J (Electrical Engineering) of this chapter.

(b) Berth lights shall be provided for each member of the crew.

§ 92.20–50 Heating.

(a) All crew spaces shall be adequately heated in a manner suitable to the purpose of the space.

(b) The heating system will be considered satisfactory if it is capable of maintaining a minimum temperature of 70° F. under normal operating conditions without undue curtailment of the ventilation.

(c) Radiators and other heating apparatus shall be so placed, and where necessary shielded, as to avoid risk of fire, danger or discomfort to the occupants. Pipes leading to radiators or heating apparatus shall be lagged where those pipes create a hazard to persons occupying the space.

§ 92.20–55 Insect screens.

(a) Except in such areas as are considered to be insect free, provision shall be made to protect the crew quarters against the admission of insects. This may be accomplished by the fitting of suitable screens to ventilating skylights, airports, ventilators, and doors to unscreened spaces and the open deck or by other methods.

§ 92.20–90 Vessels contracted for prior to November 19, 1952.

(a) Vessels of less than 100 gross tons, contracted for prior to November 19, 1952, shall meet the general intent of § 92.20–5 and in addition shall meet the following requirements:

(1) Existing structure, arrangements, materials, and facilities, previously accepted or approved will be considered satisfactory so long as they are maintained in a suitable condition to the satisfaction of the Officer in Charge, Marine Inspection. Minor repairs and alterations may be made to the same standard as the original construction.

(b) Vessels of 100 gross tons and over, contracted for prior to March 4, 1915, shall meet the requirements of this paragraph.

(1) Existing structure, arrangements, materials, and facilities, previously approved will be considered satisfactory so long as they are maintained in good condition to the satisfaction of the Officer in Charge, Marine Inspection. Minor repairs and alterations may be made to the same standard as the original construction: *Provided*, That in no case will a greater departure from the standards of §§ 92.20–5 through 92.20–55 be permitted than presently exists.

(c) Vessels of 100 gross tons and over, contracted for on or after March 4, 1915, but prior to January 1, 1941, shall meet the requirements of this paragraph.

(1) Existing structure, arrangements, materials, and facilities, previously approved will be considered satisfactory so long as they are maintained in a suitable condition to the satisfaction of the Officer in Charge, Marine Inspection. Minor repairs and alterations may be made to the same standard as the original construction.

(2) Where reasonable and practicable, a minimum of one toilet, shower, and washbasin shall be provided for each 10 members of the crew or fraction thereof.

(3) Crew spaces shall have a volume of at least 120 cubic feet and a deck area of at least 16 square feet for each person accommodated.

(4) Each crewmember shall have a separate berth, and berths may not be placed more than two high.

(5) Each vessel, which in the ordinary course of its trade makes a voyage of more than three days' duration between ports and which carries a crew of 12 or more persons, shall be provided with a suitable hospital space for the exclusive use of the sick or injured. Berths shall be provided in the ratio of one berth for each twelve members of the crew or fraction thereof, but the number of berths need not exceed six.

(6) The crew spaces shall be securely constructed, properly lighted, heated, drained, ventilated, equipped, located, and arranged, and where practicable, shall be insulated from undue noise and effluvia.

(d) Vessels of 100 gross tons and over, contracted for on or after January 1, 1941, but prior to November 19, 1952, shall meet the requirements of this paragraph.

(1) Existing structure, arrangements, materials, and facilities, previously approved will be considered satisfactory so long as they are maintained in a suitable condition to the satisfaction of the Officer in Charge, Marine Inspection. Minor repairs and alterations may be made to the same standard as the original construction.

(2) Washrooms and toilet rooms:

(i) There shall be a minimum of one toilet, shower, and washbasin for each 8 members of the crew or fraction thereof who are not accommodated in rooms having attached private or semiprivate facilities.

(ii) Separate facilities shall be provided for the engineroom, deck, or stewards department when the number of crew in that department, exclusive of officers, exceeds 8.

(iii) Toilet rooms shall be separate from the wash rooms. At least one washbasin shall be installed in each toilet room.

(iv) Toilets shall be provided with seats of the open front type. Urinals may be fitted in toilet rooms, if desired, but no reduction will be made in the required number of toilets.

(v) Washbasins, showers, and bath tubs if substituted for showers, shall be equipped with proper plumbing including hot and cold running water.

(3) Crew spaces shall have a volume of at least 120 cubic feet and a deck area of at least 16 square feet for each person accommodated.

(4) Each crewmember shall have a separate berth, and berths may not be placed more than two high.

(5) Each vessel, which in the ordinary course of its trade makes a voyage of more than three days duration between ports and which carries a crew of 12 or more persons, shall be provided with a suitable hospital space for the exclusive use of the sick or injured. Berths shall be provided in the ratio of one berth for each 12 members of the crew or fraction thereof, but the number of berths need not exceed six.

(6) The crew spaces shall be securely constructed, properly lighted, heated,

drained, ventilated, equipped, located, and arranged, and where practicable, shall be insulated from undue noise and effluvia.

Subpart 92.25—Rails and Guards

§ 92.25–1 Application.

(a) The provisions of this subpart, with the exception of § 92.25–90, shall apply to all vessels contracted for on or after July 1, 1960. Vessels contracted for prior to July 1, 1960, shall meet the requirements of § 92.25–90.

§ 92.25–5 Where rails required.

(a) Rails at least 36 inches high or equivalent protection shall be installed near the periphery of all weather decks accessible to persons on board. Such rails on decks which extend outboard to the side of the vessel shall be in at least three courses approximately evenly spaced. Such rails on decks which do not extend outboard to the side of the vessel, such as tops of deckhouses and winch houses, shall be in at least two courses approximately evenly spaced. If it can be shown to the satisfaction of the Officer in Charge, Marine Inspection, that the installation of rails of such height will be unreasonable and impracticable, having regard to the business of the vessel, rails of a lesser height or in some cases grab rails may be accepted and inboard rails may be eliminated if the deck is not generally accessible.

§ 92.25–10 Storm rails.

(a) On vessels in ocean and coastwise service, suitable storm rails shall be installed in all passageways and at the deckhouse sides where persons on board might have normal access. Storm rails shall be installed on both sides of passageways which are 6 feet or more in width.

§ 92.25–15 Guards in dangerous places.

(a) Suitable hand covers, guards, or rails shall be installed in way of all exposed and dangerous places such as gears, machinery, etc.

§ 92.25–90 Vessels contracted for prior to July 1, 1960.

(a) Existing structure, arrangements, materials, and facilities previously approved will be considered satisfactory so long as they are maintained in good condition to the satisfaction of the Officer in Charge, Marine Inspection. Minor repairs and alterations may be made to the same standards as the original construction: *Provided*, That in no case will greater departure from the standards of §§ 92.25–5 through 92.25–15 be permitted than presently exists.

PART 93—STABILITY

Subpart 93.01—Application
Sec.
93.01–1 General.

Subpart 93.05—Stability Test
93.05–1 When required.
93.05–5 Procedure.

Subpart 93.10—Stability Information for Operating Personnel
Sec.
93.10–1 Information supplied to master.

Subpart 93.13—Ballast
93.13–1 When needed.
93.13–5 Fixed ballast.
93.13–10 Liquid ballast.

Subpart 93.15—Stability Letter
93.15–1 Posting.
93.15–5 Information contained in stability letter.

AUTHORITY: The provisions of this Part 93 issued under R.S. 4405, as amended, 4462, as amended; 46 U.S.C. 375, 416. Interpret or apply R.S. 4417, as amended, 4418, as amended, 4426, as amended, 4488, as amended, 4490, as amended, sec. 3, 24 Stat. 129, as amended, 41 Stat. 305, as amended, sec. 2, 45 Stat. 1943, as amended, sec. 2, 49 Stat. 888, as amended, secs. 1, 2, 49 Stat. 1544, 1545, as amended, sec. 3, 68 Stat. 675; 46 U.S.C. 391, 392, 404, 481, 482, 483, 363, 85a, 88a, 367, 50 U.S.C. 198; E.O. 11239, July 31, 1965, 30 F.R. 9671, 3 CFR, 1965 Supp. Treasury Department Orders 120, July 31, 1950, 15 F.R. 6521; 167–14, Nov. 26, 1954, 19 F.R. 8026; CGFR 56–28, July 24, 1956, 21 F.R. 5659; 167–38, Oct. 26, 1959, 24 F.R. 8857, unless otherwise noted.

Subpart 93.01—Application

§ 93.01–1 General.

(a) The provisions of this part shall apply to the following vessels:

(1) All vessels contracted for on or after November 19, 1952, on an international voyage.

(2) Any other vessel whose stability is questioned by the Commandant or the Officer in Charge, Marine Inspection.

Subpart 93.05—Stability Test

§ 93.05–1 When required.

(a) Except as otherwise provided in this section, each vessel to which this part pertains shall be subjected to a stability test conducted under the supervision of the Coast Guard and the results of the test shall be approved before the vessel is placed in service.

(b) The Commandant may allow the stability test of a vessel to be dispensed with provided basic stability data are available from the stability test of a sister vessel and it is shown to the satisfaction of the Commandant that reliable stability information for the exempted vessel can be obtained from such basic data.

(c) The Commandant may also allow the stability test of an individual vessel or class of vessels, especially designed for the carriage of liquid or ore in bulk, to be dispensed with when reference to existing data for similar vessels clearly indicates that due to the vessel's proportions and arrangements more than sufficient metacentric height will be available in all probable loading conditions.

§ 93.05–5 Procedure.

(a) *Stability tests.* Stability tests conducted on or after November 19, 1952, shall meet the requirements of this section.

(b) *Plans required.* (1) The following plans are essential for use in conducting the stability test and determining the results, and if these plans have not been previously submitted, they shall be made available at the time of the test:

Lines plan.
Curves of form, or hydrostatic curves.
General arrangement plan of decks, holds, inner bottoms, etc.
Inboard and outboard profile.
Midship section.
Capacity plan showing capacities and vertical and longitudinal centers of gravity of cargo spaces, tanks, etc.
Tank sounding tables.
Draft mark locations.

(c) *Stability test preparations.* (1) Preparations as noted in this paragraph shall be made to place a vessel in suitable condition for a stability test. The Coast Guard representative supervising the stability test may relax from these standards in a particular instance if, in his opinion, such relaxation is warranted and will not materially affect the reliability of the results of the test.

(2) To obtain dependable stability results, all tanks on the vessel, as far as practicable, shall be either completely empty and dry or fully pressed up and without air pockets. Where this is impracticable, slack tanks may be accepted provided their free surface can be readily and accurately determined for the angles of heel to be obtained during the stability test.

(3) The vessel shall be as nearly complete as practicable when the test is conducted. If additional material or equipment is to be installed after the test, a complete list of such items by weight and location shall be prepared.

(4) All dunnage, tools, and other items extraneous to the completed vessel shall be removed before the test.

(5) The vessel shall be moored in a location reasonably protected from broadside wind, waves, and tide. The depth of water shall be sufficient to provide ample clearance under the vessel against grounding. Mooring lines shall be arranged so that they will not interfere with the free rolling or listing of the vessel.

Subpart 93.10—Stability Information for Operating Personnel

§ 93.10–1 Information supplied to master.

(a) Based on the results of the stability test, information shall be prepared by the owners, approved by the Commandant, and furnished to the master which sets forth the stability data necessary to permit efficient handling of the vessel. In general, this information shall be such that the master can, for any condition of loading, by rapid and simple process, obtain accurate guidance as to the stability of the vessel and determine the freeboard.

(b) In the case of a vessel which due to its design or type of service, etc., requires special consideration of its stability characteristics, the information shall also include an indication of any operating conditions which must be maintained to assure the safety of the vessel.

(c) Where any alterations are made to a vessel so as to materially affect the stability information supplied to the

master, amended stability information shall be provided. If necessary the vessel shall have a new stability test.

Subpart 93.13—Ballast

§ 93.13–1 When needed.

(a) In view of the wide range of cargo weight and distribution placed in a cargo vessel, the use of ballast may be necessary in order to provide satisfactory immersion, trim and stability.

§ 93.13–5 Fixed ballast.

(a) When fixed ballast is installed, its amount and location shall be included in the stability information provided the vessel.

(b) Fixed ballast shall not be removed from the vessel or relocated unless first approved by the Commandant, except that such ballast may be temporarily moved for examination or repair of the vessel and then only under the supervision of a marine inspector.

§ 93.13–10 Liquid ballast.

(a) Liquid ballast may be used when necessary to provide satisfactory draft, trim, weight distribution, or stability.

(b) If it is necessary to put liquid ballast in oil tanks, the oily ballast shall not be discharged overboard within any of the prohibited zones as defined in the Oil Pollution Act, 1961 (33 U.S.C. 1011), except through oily water separators which meet the requirements in § 55.10–25(n) of Subchapter F (Marine Engineering) of this chapter, or directly into sludge barges or shore facilities, or other approved means.

(Sec. 8, 75 Stat. 404; 33 U.S.C. 1007. Treasury Department Order 167–46, Nov. 6, 1961, 26 F.R. 10609)

Subpart 93.15—Stability Letter

§ 93.15–1 Posting.

(a) Each vessel subject to the requirements of this part shall have posted under glass in the pilothouse a stability letter issued by the Coast Guard before the vessel is placed in service.

§ 93.15–5 Information contained in stability letter.

(a) Stability letters issued to vessels subject to the provisions of § 93.05–1(a) or (b) will record approval of the information required by Subpart 93.10 and will set forth the master's responsibility for maintaining satisfactory stability conditions at all times.

(b) Stability letters issued to vessels which are exempted from a stability test in accordance with § 93.05–1(c), will record this fact.

PART 94—LIFESAVING EQUIPMENT

Subpart 94.01—Application

Sec.
94.01–1 Details of application.

Subpart 94.05—General Provisions Pertaining to Lifesaving Equipment

94.05–1 Equipment of an approved type.
94.05–5 Equipment installed but not required.
94.05–10 Primary lifesaving equipment.

Subpart 94.10—Lifeboats, Liferafts, Lifefloats, Buoyant Apparatus, and Rescue Boats

Sec.
94.10–1 Application.
94.10–5 Type of lifeboats, liferafts, lifefloats, buoyant apparatus, and rescue boats required.
94.10–10 Requirements for vessels in ocean or coastwise service other than barges; towing, fishing, and wrecking vessels; pilot boats; and yachts.
94.10–15 Requirements for seagoing barges in ocean or coastwise service.
94.10–20 Requirements for towing, fishing, and wrecking vessels, and pilot boats in ocean or coastwise service.
94.10–25 Requirements for yachts in ocean or coastwise service.
94.10–40 Requirements for vessels in Great Lakes, lakes, bays, and sounds; or river service other than fireboats, wrecking and fishing vessels, pilot boats, and yachts.
94.10–45 Requirements for fireboats, wrecking and fishing vessels, and pilot boats in Great Lakes; lakes, bays, and sounds; or river service.
94.10–50 Requirements for yachts in Great Lakes; lakes, bays, sounds; or river service.
94.10–55 Inflatable liferafts as an alternate for lifeboats, other liferafts, lifefloats and buoyant apparatus on certain vessels not on an international voyage.
94.10–90 Vessels contracted for prior to May 26, 1965.

Subpart 94.15—Stowage and Marking of Lifeboats, Liferafts, Lifefloats, and Buoyant Apparatus

94.15–1 Application.
94.15–5 General.
94.15–10 Stowage.
94.15–15 Marking.
94.15–90 Vessels contracted for prior to May 26, 1965.

Subpart 94.20—Equipment for Lifeboats, Liferafts, Lifefloats, and Buoyant Apparatus

94.20–1 Application.
94.20–5 General.
94.20–10 Required equipment for lifeboats.
94.20–15 Description of equipment for lifeboats.
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94.20–25 Description of equipment for liferafts.
94.20–30 Required equipment for lifefloats and buoyant apparatus.
94.20–35 Description of equipment for lifefloats and buoyant apparatus.
94.20–90 Vessels contracted for prior to May 26, 1965.

Subpart 94.25—Davits for Lifeboats

94.25–1 Application.
94.25–5 General.
94.25–10 Requirements for vessels in ocean or coastwise service.
94.25–15 Requirements for vessels in Great Lakes, lakes, bays, and sounds, or river service.
94.25–90 Vessels contracted for prior to May 26, 1965.

Subpart 94.30—Lifeboat Winches

94.30–1 Application.
94.30–5 General.
94.30–10 Number and type required.
94.30–15 Installation.
94.30–90 Vessels contracted for prior to November 19, 1952.

Subpart 94.33—Blocks and Falls for Lifeboats

Sec.
94.33–1 Application.
94.33–5 General.
94.33–10 Installations where lifeboat winches are used.
94.33–15 Installations where lifeboat winches are not used.
94.33–90 Vessels contracted for prior to May 26, 1965.

Subpart 94.35—Installation of Lifeboats, Davits and Winches

94.35–1 Application.
94.35–5 Tests and examinations.

Subpart 94.40—Life Preservers

94.40–1 Application.
94.40–5 General.
94.40–10 Number required.
94.40–15 Distribution and stowage.
94.40–90 Vessels contracted for prior to May 26, 1965.

Subpart 94.43—Ring Life Buoys and Water Lights

94.43–1 Application.
94.43–5 General.
94.43–10 Number required.
94.43–15 Distribution and securing.
94.43–90 Vessels contracted for prior to May 26, 1965.

Subpart 94.45—Line-Throwing Appliances

94.45–1 Application.
94.45–5 General.
94.45–10 Type required.
94.45–15 Equipment for line-throwing appliances.
94.45–20 Accessibility.
94.45–25 Service recommendations.
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Subpart 94.50—Embarkation Aids

94.50–1 Application.
94.50–5 Ladders.
94.50–7 Embarkation aids into inflatable liferaft.
94.50–10 Illumination for lifeboat launching operations.
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94.50–90 Vessels contracted for prior to May 26, 1965.

Subpart 94.55—Portable Radio Apparatus

94.55–1 Required on international voyage.

Subpart 94.90—Ship's Distress Signals

94.90–1 Application.
94.90–5 Vessels in ocean or coastwise service.
94.90–10 Vessels in Great Lakes service.

AUTHORITY: The provisions of this Part 94 issued under R.S. 4405, as amended, 4462, as amended; 46 U.S.C. 375, 416. Interpret or apply R.S. 4417, as amended, 4418, as amended, 4426, as amended, 4488, as amended, 4491, as amended, sec. 10, 35 Stat. 428, as amended, 41 Stat. 305, as amended, secs. 1, 2, 49 Stat. 1544, 1545, as amended, sec. 17, 54 Stat. 166, as amended, sec. 3, 68 Stat. 675; 46 U.S.C. 391, 392, 404, 481, 489, 395, 363, 367, 526p, 50 U.S.C. 198; E.O. 11239, July 31, 1965, 30 F.R. 9671, 3 CFR, 1965 Supp. Treasury Department Orders 120, July 31, 1950, 15 F.R. 6521; 167–14, Nov. 26, 1954, 19 F.R. 8026; CGFR 56–28, July 24, 1956, 21 F.R. 5659; 167–38, Oct. 26, 1959, 24 F.R. 8857.

Subpart 94.01—Application

§ 94.01–1 Details of application.

(a) Except as specifically noted, the provisions of this part shall apply to all vessels other than motorboats. Motorboats shall meet the requirements of Sub-

parts 94.01, 94.05, and 94.40, and § 94.10–1(c).

Subpart 94.05—General Provisions Pertaining to Lifesaving Equipment

§ 94.05–1 Equipment of an approved type.

(a) Where equipment in this part is required to be of an approved type, such equipment requires the specific approval of the Commandant. Such approvals are published in the FEDERAL REGISTER and in addition, are contained in Coast Guard publication CG–190, "Equipment Lists."

(b) Specifications for many of the items required to be of an approved type have been promulgated and are contained in Subchapter Q (Specifications) of this chapter. In general, such specifications are of interest only to the manufacturer of specific items of equipment.

§ 94.05–5 Equipment installed but not required.

(a) Where items of lifesaving equipment are not required, but are installed, such equipment and its installation shall meet the requirements of this part.

§ 94.05–10 Primary lifesaving equipment.

(a) The term "primary lifesaving equipment" means a lifeboat or an acceptable substitute. Life preservers and ring life buoys are not included in this definition of "primary lifesaving equipment."

Subpart 94.10—Lifeboats, Liferafts, Lifefloats, Buoyant Apparatus, and Rescue Boats

§ 94.10–1 Application.

(a) Except as otherwise provided in this section, the provisions of this subpart shall apply to all vessels other than motorboats, contracted for on or after May 26, 1965.

(b) Vessels other than motorboats, contracted for prior to May 26, 1965, shall meet the requirements of § 94.10–90.

(c) Inspected motorboats carrying freight for hire shall be provided with such number and size of approved liferafts, lifefloats, or buoyant apparatus as deemed necessary by the Officer in Charge, Marine Inspection. Workboats or skiffs may be permitted by the Officer in Charge, Marine Inspection, if considered suitable.

(d) In the case of special types of vessels subject to the International Convention for Safety of Life at Sea, 1960, which are not specifically treated in this subpart, such as whale factory ships, fish processing and canning ships, etc., the Commandant may give special consideration as to lifesaving equipment requirements to the extent permitted by the International Convention for Safety of Life at Sea, 1960.

§ 94.10–5 Type of lifeboats, liferafts, lifefloats, buoyant apparatus, and rescue boats required.

(a) *Lifeboats.* (1) All lifeboats shall be of an approved type, constructed in accordance with Subpart 160.035 of Subchapter Q (Specifications) of this chapter except as specifically noted in this part.

(2) All lifeboats certified to carry 60 or more but not over 100 persons shall be either motor lifeboats or shall be fitted with an approved type of hand-propelling gear. Lifeboats carrying more than 100 persons shall be motor lifeboats.

(3) A Class 1 motor lifeboat is one that is fitted with a compression-ignition engine, is capable of being readily started in all conditions, and has sufficient fuel for 24 hours continuous operation. The speed ahead in smooth water when loaded with its full complement of persons and equipment shall be at least 6 knots.

(4) Except as further modified in this subparagraph, all lifeboats, except those installed on vessels in river service, shall be fitted with suitable disengaging apparatus consisting of fixed hooks in the lifeboat or mechanical disengaging apparatus. Mechanical disengaging apparatus, if fitted shall be of an approved type, constructed in accordance with Subpart 160.033 of Subchapter Q (Specifications) of this chapter.

(i) All lifeboats installed on ocean, coastwise, or Great Lakes vessels of over 3,000 gross tons shall be fitted with mechanical disengaging apparatus so arranged as to make it possible for the lifeboats to be launched with their full complement of persons and equipment while such vessels are underway or stopped, and for both ends of the lifeboat to be released simultaneously, under tension or not, by one person. Simultaneous release shall be effected by partially rotating a shaft which shall be continuous and extend from points of contact with the hooks.

(ii) All lifeboats installed on any particular vessel shall be fitted with the same type of disengaging apparatus.

(iii) On small vessels, the Commandant may approve means other than those previously mentioned to agree with the needs of a particular vessel.

(b) *Liferafts.* (1) All rigid type liferafts shall be of an approved type, constructed in accordance with Subpart 160.018 of Subchapter Q (Specifications) of this chapter. Type A liferafts shall be stowed on the standard liferaft skids required by § 94.15–10(c)(1) unless specifically noted otherwise. Rigid type liferafts shall not be used as required equipment on vessels on an international voyage.

(2) All inflatable liferafts shall be of an approved type constructed in accordance with Subpart 160.051 of Subchapter Q (Specifications) of this chapter.

(3) On vessels on an international voyage, each inflatable liferaft shall have a carrying capacity of not less than 6 nor more than 25 persons.

(c) *Lifefloats.* (1) All lifefloats shall be of an approved type, constructed in accordance with Subpart 160.027 of Subchapter Q (Specifications) of this chapter.

(d) *Buoyant apparatus.* (1) All buoyant apparatus shall be of an approved type, constructed in accordance with Subpart 160.010 of Subchapter Q (Specifications) of this chapter.

(e) *Rescue boat.* (1) In general, a suitable rescue boat shall be a small lightweight boat of rigid construction, with built-in buoyancy and capable of being readily launched and easily maneuvered. Also it shall be of adequate proportion to permit taking an unconscious person on board without capsizing. A rescue boat and its installation shall be acceptable to the Officer in Charge, Marine Inspection, as suitable for the rescue of persons accidentally falling over the side, or for similar emergency purposes. The size, shape, installation, and other factors of suitability will be determined with due consideration of the size, arrangement, intended service, and crew requirements of the vessel on which it is to be installed.

§ 94.10–10 Requirements for vessels in ocean or coastwise service other than barges; towing, fishing, and wrecking vessels; pilot boats; and yachts.

(a) All vessels shall be provided with sufficient lifeboats on each side of the vessel to accommodate all persons on board.

(b) Lifeboats shall be not less than 24 feet in length, except where owing to the size of the vessel, or for other reasons, the Commandant considers the carriage of such lifeboats to be unreasonable or impracticable. However, in no case shall lifeboats of less than 16 feet in length be used.

(c) All vessels of 1,600 gross tons and over on an international voyage shall carry at least one motor-propelled lifeboat of Class 1.

(d) In addition to the lifeboats required by paragraph (a) of this section, all vessels on an international voyage and all vessels in ocean service shall be provided with liferafts of such aggregate capacity to accommodate at least one-half the total number of persons on board. Those vessels having widely spaced accommodations and/or working spaces shall have at least one liferaft in each such location.

(e) Inflatable liferafts may be substituted for lifeboats on certain vessels not on an international voyage in accordance with § 94.10–55.

§ 94.10–15 Requirements for seagoing barges in ocean or coastwise service.

(a) All manned seagoing barges of 100 gross tons and over shall be provided with a lifeboat of sufficient capacity for all persons on board. All lifeboats shall have a capacity of at least 80 cubic feet.

(b) Inflatable liferafts may be substituted for lifeboats on certain vessels in accordance with § 94.10–55.

§ 94.10–20 Requirements for towing, fishing, and wrecking vessels, and pilot boats in ocean or coastwise service.

(a) All vessels of 500 gross tons and over on an international voyage, other than fishing vessels, shall meet the applicable requirements of § 94.10–10 in lieu of the requirements of this section.

(b) All vessels shall carry sufficient lifeboats or flotation equipment for all

persons on board. In lieu of the standard lifeboats required by § 94.10–5 (a), the following types of boats or flotation equipment may be used by the vessels specified:

(1) Vessels engaged exclusively in the business of purse seining may use their seine boats.

(2) Vessels engaged exclusively in the business of hook and line fishing from dories may use their dories provided they are fitted with air tanks of sufficient capacity to meet the requirements of Subpart 160.035 of Subchapter Q (Specifications) of this chapter for lifeboats.

(3) Vessels engaged exclusively in the business of wrecking may use their surf boats.

(4) Vessels engaged exclusively in the business of furnishing pilots to vessels may use their launches and/or yawls.

(5) Vessels not exceeding 150 feet in length which are under 300 gross tons engaged exclusively in the business of transporting supplies, equipment, and cargo to or from operational sites of exploration, development, removal and storage of resources or related activities thereof on the continental shelf of the United States in the Gulf of Mexico, in the Atlantic Ocean south of the thirty-third parallel north latitude and in the Pacific Ocean may use lifefloats in lieu of lifeboats if a suitable emergency boat is carried and is adequately installed. Vessels in this category may carry persons in addition to the crew up to the number specified in the certificate of inspection, but not to exceed 16, and such persons may be only industry personnel engaged exclusively in the exploration, development, removal and storage of resources, or related activities thereof, who are required by the nature of their work to ride such vessels.

(c) All lifeboats shall have a capacity of at least 180 cubic feet. However, the Coast Guard District Commander may, in exceptional cases, permit smaller lifeboats where the crew is insufficient to handle the larger lifeboat or where there is lack of space to carry such larger lifeboat. In no case may lifeboats be used having a capacity of less than 125 cubic feet.

(d) Inflatable liferafts may be substituted for lifeboats, liferafts, lifefloats and buoyant apparatus on certain vessels in accordance with § 94.10–55.

§ 94.10–25 Requirements for yachts in ocean or coastwise service.

(a) All yachts in ocean service shall have an aggregate lifeboat and liferaft capacity for all persons on board. Not less than 75 percent of the required capacity shall be in lifeboats and the remainder may be in Type A or Type B liferafts.

(b) All yachts in coastwise service shall have an aggregate lifeboat and liferaft capacity as required in paragraph (a) of this section, except that during the interval between May 15 and October 15 in any one year, both dates inclusive, they shall only be required to be equipped with lifeboat and liferaft capacity to accommodate 70 percent of all persons on board, not less than 50 percent of the required capacity shall be in lifeboats and the remainder may be in Type A or Type B liferafts.

(c) All lifeboats shall have a capacity of at least 125 cubic feet. However, the Coast Guard District Commander may, if he deems it proper, modify the requirements as to the size of lifeboats.

(d) Yachts may use their launches in lieu of the standard lifeboats required by § 94.10–5 (a), provided the launches are equipped with air tanks of sufficient capacity to meet the requirements of Subpart 160.035 of Subchapter Q (Specifications) of this chapter for lifeboats. Such launches shall be fitted with suitable nameboards or the name of the vessel shall be painted on the bow or stern.

(e) Inflatable liferafts may be substituted for lifeboats and liferafts on certain vessels in accordance with § 94.10–55.

§ 94.10–40 Requirements for vessels in Great Lakes; lakes, bays, and sounds; or river service other than fireboats, wrecking and fishing vessels, pilot boats, and yachts.

(a) All vessels, except those on an international voyage, shall be provided with lifeboats and liferafts as required by Table 94.10–40(a).

(b) Inflatable liferafts may be substituted for lifeboats and liferafts on certain vessels in accordance with § 94.10–55.

(c) All vessels on an international voyage shall meet the applicable requirements of § 94.10–10.

TABLE 94.10–40 (a)—LIFEBOATS AND LIFERAFTS REQUIRED ON VESSELS IN GREAT LAKES; LAKES, BAYS, AND SOUNDS AND RIVER SERVICE OTHER THAN FIREBOATS, WRECKING AND FISHING VESSELS, PILOT BOATS, AND YACHTS

	Great Lakes			Lakes, bays, and sounds		Rivers	
		Other vessels					
	Vessels carrying cargo	50 gross tons and over	Under 50 gross tons	50 gross tons and over	Under 50 gross tons	50 gross tons and over	Under 50 gross tons
Percentage of persons to be accommodated.	100	100	100	100	100	At least one suitable boat with lines attached and supplied with oars.[3]	Only lifeboats or liferafts as in the judgment of Officer in Charge, Marine Inspection, are necessary.
Percentage of required equipment in lifeboats.	[1] 100	[1] [2] 50	Either lifeboats or liferafts.	[2] 50	Either lifeboats or liferafts.	do	Do.
Percentage of required equipment which may be in Type A or Type B liferafts.	None	50	do	50	do	do	Do.

[1] When of 300 gross tons and over, vessels carrying cargo having berthing and/or working spaces forward widely separated from messing or recreational spaces aft shall have, in addition to all other lifeboats and liferafts required, two fully equipped approved liferafts of not less than 15-person capacity. These liferafts shall be stowed (not necessarily in skids) so as to float clear in the event of sinking of the vessel. One shall be located forward and the other aft. An approved lifefloat of not less than 15-person capacity may be substituted for the required liferaft aft. When of 300 gross tons and over, vessels carrying cargo (not having berthing and/or working spaces forward widely separated from messing or recreational spaces aft) and towing vessels are required to have only one approved liferaft or lifefloat of not less than 15-person capacity as additional lifesaving equipment.

[2] Harbor towing vessels of less than 150 gross tons may substitute one or more liferafts of Type A or Type B for the lifeboats required if the lifeboats interfere with the practical operation of the vessel and the substitution may be made with safety in the opinion of the Officer in Charge, Marine Inspection.

[3] Vessels navigating waters where the average depth of the channel does not exceed 3 feet shall not be required to be equipped with boats.

§ 94.10–45 Requirements for fireboats, wrecking and fishing vessels, and pilot boats in Great Lakes; lakes, bays, and sounds; or river service.

(a) All vessels of 50 gross tons and over shall have an aggregate lifeboat and liferaft capacity to accommodate all persons on board. Not less than 50 percent of such capacity shall be in lifeboats and the remainder may be in Type A or Type B liferafts.

(b) All vessels of less than 50 gross tons shall have an aggregate lifeboat and liferaft capacity to accommodate all persons on board. The liferafts may be either Type A or Type B.

(c) In lieu of the standard lifeboats required by § 94.10–5 (a) the following types of boats may be used:

(1) Vessels used exclusively as fireboats and connected to or belonging to a regularly organized fire department shall be required to carry only such boats or rafts as in the judgment of the Officer in Charge, Marine Inspection, may be required to carry the crew.

(2) Vessels engaged exclusively in the business of furnishing pilots to vessels may use their launches and/or yawls.

(3) Vessels engaged exclusively in the business of wrecking may use their surf boats.

(4) Vessels engaged exclusively in the business of seine fishing may use their seine boats.

(d) Inflatable liferafts may be substituted for lifeboats and liferafts on certain vessels in accordance with § 94.10–55.

§ 94.10–50 Requirements for yachts in Great Lakes; lakes, bays, and sounds; or river service.

(a) All yachts shall be fitted with lifeboats and liferafts as required by Table 94.10–40(a), depending upon the service. Alternatively, such equipment may be provided as required by Table 75.10–20

(a) of Subchapter H (Passenger Vessels) of this chapter.

(b) Inflatable liferafts may be substituted for lifeboats and liferafts on certain vessels in accordance with § 94.10–55.

§ 94.10–55 Inflatable liferafts as an alternate for lifeboats, other liferafts, lifefloats and buoyant apparatus on certain vessels not on an international voyage.

(a) (1) On all vessels inflatable liferafts may be permitted as substitutes for other types of liferafts, lifefloats and buoyant apparatus wherever they may be required.

(2) The capacity of inflatable liferafts carried in place of other liferafts, lifefloats, and buoyant apparatus shall be at least equivalent to that required of the equipment for which substitution is made.

(3) The substitution of inflatable liferafts shall not be made without prior approval of the Officer in Charge, Marine Inspection.

(b) On all vessels less than 3,000 gross tons the substitution of liferafts for lifeboats may be permitted as follows:

(1) (i) On all vessels under 500 gross tons, inflatable liferafts may be substituted for all required lifeboats.

(ii) The total capacity of the inflatable liferafts shall be at least equal to the total number of persons that the lifeboats would have been required to accommodate. Partial substitution is permissible provided the aggregate lifeboat and inflatable liferaft capacity is sufficient to accommodate the required number of persons, as indicated above.

(iii) Where substitution of inflatable liferafts is made, a suitable rescue boat shall be provided. In the case of partial substitution, a lifeboat may serve as the rescue boat.

(iv) In the exceptional case on a vessel under 100 gross tons, the rescue boat may be omitted when it can be shown to the satisfaction of the Commandant that it is not necessary due to the size, arrangement and maneuverability of the vessel, and its intended service.

(2) (i) On all vessels of 500 gross tons and upward to 1,600 gross tons, inflatable liferafts may be substituted for all required lifeboats provided one approved lifeboat of a size acceptable to the Officer in Charge, Marine Inspection, suitable for rescue purposes, is installed.

(ii) The aggregate lifeboat and inflatable liferaft capacity shall be at least equal to the total number of persons that the lifeboats would have been required to accommodate.

(iii) The launching arrangement and location of the lifeboat to be used as rescue boat shall be such that it can be readily launched and shall be to the satisfaction of the Officer in Charge, Marine Inspection.

(3) (i) On all vessels of 1,600 gross tons and upward to 3,000 gross tons, inflatable liferafts may be substituted for all except two of the required lifeboats. These lifeboats shall be of a size acceptable to the Officer in Charge, Marine Inspection, and shall be suitable for rescue purposes. In all cases, two approved lifeboats, one on each side, shall be provided.

(ii) The aggregate lifeboat and inflatable liferaft capacity shall be at least equal to the total number of persons that the lifeboats, for which substitutions are made plus those remaining on board, would have been required to accommodate.

(4) The substitution of inflatable liferafts for lifeboats shall not be made without prior approval of the Officer in Charge, Marine Inspection.

(c) On all seagoing barges of 100 gross tons and over an inflatable liferaft may be substituted for the required lifeboat, the total capacity of which shall be sufficient to accommodate all persons on board.

(1) On seagoing barges employed as drilling tenders in the offshore oil exploration industry where substitution of inflatable liferafts is made, a suitable rescue boat shall be provided. In the case of partial substitution, a lifeboat may serve as the rescue boat.

(d) The Commandant may give special consideration to the substitution of approved inflatable liferafts for required lifeboats on vessels of 3,000 gross tons and over.

§ 94.10–90 Vessels contracted for prior to May 26, 1965.

(a) Vessels contracted for prior to May 26, 1965, shall meet the following requirements:

(1) Except as specifically modified by this paragraph, the requirements of §§ 94.10–5 through 94.10–55 shall be complied with insofar as the number and general type of lifesaving equipment is concerned. Existing items of lifesaving equipment previously approved, but not meeting the applicable specifications or requirements set forth in §§ 94.10–5 through 94.10–55 may be continued in service so long as they are maintained in good condition to the satisfaction of the Officer in Charge, Marine Inspection. Minor repairs, alterations, and replacements may be permitted to the same standards as the original installation. However, all new installations or major replacements shall meet the applicable specifications or requirements.

(2) On vessels of over 3,000 gross tons certificated for ocean, coastwise, or Great Lakes service, all replacement of disengaging apparatus shall meet the requirements of § 94.10–5(a) (4) (i). On all other vessels certificated for any service, all of the lifeboats on a particular vessel shall be fitted with the same type of disengaging apparatus.

(3) The requirements of § 94.10–10(c) shall not apply except for replacements, and then only if it can be done without change to existing davits and arrangements.

Subpart 94.15—Stowage and Marking of Lifeboats, Liferafts, Lifefloats, and Buoyant Apparatus

§ 94.15–1 Application.

(a) The provisions of this subpart, with the exception of § 94.15–90, shall apply to all vessels contracted for on or after May 26, 1965. Vessels contracted for prior to May 26, 1965, shall meet the requirements of § 94.15–90.

§ 94.15–5 General.

(a) The lifeboats, liferafts, lifefloats, and buoyant apparatus shall be readily available in the case of emergency, and shall be kept in good working order and available for immediate use at all times when the vessel is being navigated and, insofar as reasonable and practicable, while the vessel is not being navigated.

(b) The decks on which lifeboats, liferafts, lifefloats, and buoyant apparatus are carried shall be kept clear of freight or any other obstructions which would interfere with the immediate launching of the lifesaving appliances.

§ 94.15–10 Stowage.

(a) *General.* Lifeboats, liferafts, lifefloats, and buoyant apparatus shall be stowed in such a manner that:

(1) They are capable of being launched in the shortest possible time.

(2) They shall not impede the launching or handling of other lifesaving appliances.

(3) They shall not impede the marshalling of persons at the embarkation stations, or their embarkation.

(4) They shall be capable of being put in the water safely and rapidly even under unfavorable conditions of list and trim.

(b) *Lifeboat stowage.* (1) Every lifeboat shall be attached to a separate set of davits.

(2) Suitable access to the lifeboats shall be provided to enable the crew to prepare the lifeboats for launching.

(3) Lifeboats shall be so stowed that embarkation into them may be made rapidly and in good order.

(4) Lifeboats shall not be stowed in the bows of the vessel nor as far aft as to be endangered by the propellers or overhang of the stern.

(5) Lifeboats shall be so stowed that it shall not be necessary to lift them in order to swing out the davits, except on small vessels where such requirement is unreasonable and impracticable in the opinion of the Officer in Charge, Marine Inspection.

(6) Means shall be provided for bringing the lifeboats against the ship's side and holding them there so that persons may be safely embarked.

(7) On vessels certificated for ocean or coastwise service, lifeboats shall be fitted with skates or other suitable means to facilitate launching against an adverse list of up to 15 degrees. However, skates may be dispensed with if, in the opinion of the Commandant, the arrangements are such as to insure that the lifeboats can be satisfactorily launched without such skates.

(8) On vessels in ocean and coastwise service, where applicable, means shall be provided outside the machinery space to prevent the discharge of water into the lifeboats while they are being lowered. This shall consist of baffles to deflect the water down the vessel's side, or reach rods, or other means to close the discharge openings.

(c) *Liferaft stowage.* (1) Type A liferafts shall be stowed on standard skids constructed in accordance with Subpart 160.042 of Subchapter Q (Specifications) of this chapter.

(2) Type B liferafts shall be stowed in such a manner that they may be readily launched.

(3) The additional liferaft required on Great Lakes vessels by Table 94.10–40 (a) shall be stowed in such a manner that it will float clear in the event of sinking of the vessel. The requirements of subparagraphs (1) and (2) of this paragraph need not be complied with for such liferaft.

(4) Inflatable liferafts shall be stowed in such a manner that they will float free in the event of the vessel sinking. Stowage and launching arrangements will be to the satisfaction of the Officer in Charge, Marine Inspection.

(d) *Lifefloat and buoyant apparatus stowage.* (1) Lifefloats and buoyant apparatus shall be stowed in such a manner as to be readily launched. Lifefloats exceeding 400 pounds in weight shall be stowed in such a manner as not to require lifting before launching.

(2) Lifefloats and buoyant apparatus shall not be secured to the vessel except by lashings which can be easily slipped. They may be stowed in tiers one above the other, but not more than four high. When stowed in tiers, the separate units shall be kept apart by suitable distance pieces.

(3) Means shall be provided to prevent shifting.

§ 94.15–15 Marking.

(a) Lifeboats, liferafts, lifefloats, and buoyant apparatus shall be marked as required by §§ 97.37–37 and 97.37–40 of this subchapter.

§ 94.15–90 Vessels contracted for prior to May 26, 1965.

(a) Vessels contracted for prior to May 26, 1965, shall meet the following requirements:

(1) The provisions of §§ 94.15–5 through 94.15–15 shall be met except as further set forth in this paragraph.

(2) The requirements of § 94.15–10(b) (7) shall apply unless in the opinion of the Officer in Charge, Marine Inspection, it is unreasonable or impracticable, or the arrangement or construction of the vessel make the use of skates or similar appliances unnecessary.

Subpart 94.20—Equipment for Lifeboats, Liferafts, Lifefloats, and Buoyant Apparatus

§ 94.20–1 Application.

(a) The provisions of this subpart, with the exception of § 94.20–90, shall apply to all vessels contracted for on or after May 26, 1965. Vessels contracted for prior to May 26, 1965, shall meet the requirements of § 94.20–90.

§ 94.20–5 General.

(a) Equipment for lifeboats, liferafts, lifefloats, and buoyant apparatus shall be of good quality, efficient for the purpose they are intended to serve, and kept in good condition.

(b) Lifeboats, liferafts, lifefloats, and buoyant apparatus shall be fully equipped before the vessel is navigated and the equipment shall remain in such lifesaving appliances throughout the voyage, except as provided in § 97.15–45 (e) of this subchapter.

(c) It shall be unlawful to stow in any lifeboat, liferaft, lifefloat, or buoyant apparatus any article not required by this subpart unless such article can be properly stowed so as not to reduce the seating capacity or space available to the occupants and so as not to adversely affect the seaworthiness of such appliances or, in the case of lifeboats, overload the davits or winches.

(d) Loose equipment, except boathooks in lifeboats, shall be securely attached to the lifesaving appliance to which it belongs.

§ 94.20–10 Required equipment for lifeboats.

(a) The lifeboats for all vessels shall be equipped in accordance with Table 94.20–10(a). For a description of the items contained in this table, and the units comprising the items, see the applicable paragraphs of § 94.20–15. The letter identification prefixing the item in the table corresponds to the paragraph designations in § 94.20–15.

TABLE 94.20–10(a)

Letter identification	Item	Ocean and coastwise		Great Lakes		Lakes, bays and sounds; and rivers
		Other than seagoing barges	Seagoing barges	Vessels carrying cargo	Other	
a	Bailer	1	None	1	None	None
b	Bilge pump	[1] 1	None	None	None	None
c	Boathooks	2	2	1	1	1
d	Bucket	2	1	1	1	1
e	Compass and mounting	1	None	None	None	None
f	Ditty bag	1	None	None	None	None
g	Drinking cups	1	1	None	None	None
h	Fire extinguishers (motor-propelled lifeboats only).	2	2	2	2	2
i	First-aid kit	1	None	None	None	None
j	Flashlight	1	None	1	None	None
k	Hatchets	2	None	2	1	1
l	Heaving line	2	None	None	None	None
m	Jackknife	1	1	None	None	None
n	Ladder, lifeboat, gunwale	1	None	None	None	None
o	Lantern	1	1	1	1	1
p	Lifeline	1	1	1	1	1
q	Life preservers	2	2	2	2	2
r	Locker	1	None	1	None	None
s	Mast and sail (oar-propelled lifeboats only)	1	None	None	None	None
t	Matches (boxes)	2	2	1	1	1
u	Milk, condensed (pounds per person)	1	None	None	None	None
v	Mirrors, signaling	2	None	None	None	None
w	Oars	[2] 1 unit	[2] 1 unit	[2] 1 unit	[2] 1 unit	[2] 1 unit
x	Oil, illuminating (quarts)	1	None	1	None	None
y	Oil, storm (gallons)	1	None	1	None	None
z	Painter	2	1	2	1	1
aa	Plugs	1	1	1	1	1
bb	Provisions (pounds per person)	2	None	None	None	None
cc	Rowlocks	[2] 1 unit	[2] 1 unit	[2] 1 unit	[2] 1 unit	[2] 1 unit
dd	Rudder and tiller	1	1	1	1	None
ee	Sea anchor	1	None	1	None	None
ff	Signals, distress, floating orange smoke	2	None	None	None	None
gg	Signals, distress, red hand flare	[2] 1 unit	None	[2] ½ unit	None	None
hh	Signals, distress, red parachute flare	[2] 1 unit	None	[2] ½ unit	None	None
ii	Tool kit (motor-propelled lifeboat only)	[2] 1 unit	[2] 1 unit	[2] 1 unit	[2] 1 unit	[2] 1 unit
jj	Water (quarts per person)	3	1	None	None	None
kk	Whistle, signaling	1	None	None	None	None
ll	Fishing kit	1	None	None	None	None
mm	Cover, protecting	1	None	None	None	None
nn	Signals, lifesaving	1	None	None	None	None
oo	Desalting kit	[4] 1	None	None	None	None

[1] Motor-propelled lifeboats, certified for 100 or more persons, shall be fitted with an additional hand bilge pump of an approved type or a power bilge pump.
[2] For description of units, see § 94.20–15.
[3] Vessels in coastwise service need only carry 1 unit for each 5 lifeboats or fraction thereof.
[4] Optional equipment. See § 94.20–15(jj) water.

§ 94.20–15 Description of equipment for lifeboats.

(a) *Bailer.* The bailer shall have a lanyard attached and shall be of sufficient size and suitable for bailing.

(b) *Bilge pump.* Bilge pumps shall be of an approved type, constructed in accordance with Subpart 160.044 of Subchapter Q (Specifications) of this chapter. They shall be of the size given in Table 94.20–15 (b) depending upon the capacity of the lifeboat as determined by the six-tenths rule as described in § 160.035–8 (b) of Subchapter Q (Specifications) of this chapter.

TABLE 94.20–15 (b)

Capacity of lifeboat, cubic feet		Bilge pump size
Over	Not over	
--------	330	1
330	700	2
700	--------	3

(c) *Boathooks.* Boathooks shall be of the single hook ball-point type. Boathook handles shall be of clear grained white ash, or equivalent, and of a length

and diameter as given in Table 94.20–15 (c).

TABLE 94.20-15 (c)

Length of lifeboat, feet		Boathook handles	
Over	Not over	Diameter, inches	Length, feet
.....	23	1½	8
23	29	1¾	10
29	.....	2	12

(d) *Bucket.* The bucket shall be of heavy gage galvanized iron, or other suitable corrosion-resistant metal, of not less than 2-gallon capacity, and shall have a 6-foot lanyard of 12-thread manila attached.

(e) *Compass and mounting.* The compass and mounting shall be of an approved type constructed in accordance with U. S. Coast Guard specification dated December 14, 1944.

(f) *Ditty bag.* The ditty bag shall consist of a canvas bag and shall contain a sailmaker's palm, needles, sail twine, marline, and marline spike.

(g) *Drinking cups.* Drinking cups shall be enamel coated or plastic, graduated in ounces, and be provided with lanyards 3 feet in length.

(h) *Fire extinguisher.* Fire extinguishers shall be of approved Type B–C, Size I (see § 95.50–5 of this subchapter). One shall be attached to each end of the lifeboat.

(i) *First-aid kit.* The first-aid kit shall be of an approved type, constructed and fitted in accordance with Subpart 160.041 of Subchapter Q (Specifications) of this chapter.

(j) *Flashlight.* The flashlight shall be of an approved Type I, Size No. 3, constructed in accordance with Subpart 161.008 of Subchapter Q (Specifications) of this chapter. Three spare cells (or one 3-cell battery) and two spare bulbs, stowed in a watertight container, shall be provided with each flashlight. Batteries shall be replaced yearly during the annual stripping, cleaning, and overhaul of the lifeboat.

(k) *Hatchet.* Hatchets shall be of an approved type, constructed in accordance with Subpart 160.013 of Subchapter Q (Specifications) of this chapter. They shall be attached to the lifeboat by individual lanyards and be readily available for use, one at each end of the lifeboat.

(l) *Heaving line.* The heaving line shall be of adequate strength, 10 fathoms in length, and 1 inch in circumference. It shall be of such quality as to be buoyant after 24 hours' submergence.

(m) *Jackknife.* The jackknife (with can opener) shall be of an approved type, constructed in accordance with Subpart 160.043 of Subchapter Q (Specifications) of this chapter.

(n) *Ladder, lifeboat gunwale.* The lifeboat gunwale ladder shall consist of 3 flat wood steps cut out for hand holds. The steps shall be spaced 12 inches apart and fastened with ⅝ inch diameter manila rope. Each rope end shall be tied inside the lifeboat at about amidships with the ladder stowed on top of the side benches and ready for immediate use. Other suitable devices may be specifically approved.

(o) *Lantern.* The lantern shall contain sufficient oil to burn for at least 9 hours, and shall be ready for immediate use.

(p) *Lifeline.* The lifeline shall be properly secured to both sides of the lifeboat along its entire length, festooned in bights not longer than 3 feet, with a seine float in each bight, which float may be omitted if the line is of an inherently buoyant material and absorbs little or no water. The lifeline shall be of a size and strength not less than ⅜-inch diameter manila. The bights shall hang to within 12 inches of the water when the lifeboat is light.

(q) *Life preservers.* Life preservers shall be of an approved type, constructed in accordance with the applicable subparts of Subchapter Q (Specifications) of this chapter.

(r) *Locker.* The locker shall be suitable for the storage and preservation of the small items of equipment.

(s) *Mast and sail.* A unit, consisting of a standing lug sail together with the necessary spars and rigging, shall be provided in general agreement with Table 94.20–15 (s). The sails shall be of good quality canvas, colored Indian Orange (Cable No. 70072, Standard Color Card of America). Rigging shall consist of galvanized wire rope not less than 5/16 inch in diameter. The mast and sail shall be protected by a suitable canvas cover.

TABLE 94.20-15 (s)

Length of lifeboat, feet		Standing lug sail							Mast [1]		Yard [1]	
Over	Not over	Area, square feet	Luff and head lengths	Leach length	Foot length	Clew to throat	Ounces per square yard	Commercial designation No.	Length	Diameter, inches	Length	Diameter, inches
			Ft. In.	Ft. In.	Ft. In.	Ft. In.			Ft. In.		Ft. In.	
.....	17	58	8 11	12 1	8 10	10 10	14.35	10	11 2	3	6 11	2
17	19	74	9 8	13 8	10 0	12 2	14.35	10	12 6	3	7 8	2
19	21	93	7 5	15 1	11 2	13 8	14.35	10	13 10	3½	8 5	2½
21	23	113	8 3	16 11	12 4	15 1	14.35	10	15 2	3½	9 3	2½
23	25	135	9 0	18 6	13 6	16 6	14.35	10	16 6	4	10 0	3
25	27	158	9 9	20 0	14 7	17 10	17.50	8	17 10	4	10 9	3
27	29	181	10 5	21 5	15 7	19 1	17.50	8	19 2	4½	11 5	3½
29	31	203	11 0	22 8	16 6	20 3	20.74	6	20 6	4½	12 0	3½
31	[2]	[2]	[2]	[2]	[2]	[2]	[2]	[2]	[2]	[2]	[2]	[2]

[1] Mast lengths measured from heel to center of upper halyard sheave. Mast diameters measured at thwart. Mast and yard shall be of clear-grained spruce, fir, or equivalent.
[2] Subject to special consideration.

(t) *Matches.* A box of friction matches in a watertight container stowed in an equipment locker or secured to the underside of the stern thwart if no locker is fitted.

(u) *Milk, condensed.* One pound of condensed milk shall be provided for each person the lifeboat is certified to carry, to be stowed in lockers or other compartments providing suitable protection.

(v) *Mirrors, signaling.* Signaling mirrors shall be of an approved type.

(w) *Oars.* A unit, consisting of a complement of rowing oars and steering oar, shall be provided for each lifeboat in accordance with Table 94.20–15(w), except that motor-propelled and hand-propelled lifeboats need only be equipped with four rowing oars and one steering oar. In any case, the emergency lifeboats shall be provided with the full complement of oars prescribed by the table. All oars shall be buoyant.

TABLE 94.20-15 (w)

Length of lifeboat, feet		Number of oars		Length of oars, feet	
Over	Not over	Rowing	Steering	Rowing	Steering
.....	15	4	1	8	9
15	19	6	1	10	11
19	21	6	1	11	12
21	23	6	1	12	13
23	25	8	1	13	14
25	27	8	1	14	15
27	----	8	1	15	16

(x) *Oil, illuminating.* One quart of illuminating oil shall be provided in a metal container.

(y) *Oil, storm.* One gallon of vegetable, fish, or animal oil shall be provided in a suitable metal container so constructed as to permit a controlled distribution of oil on the water, and so arranged that it can be attached to the sea anchor.

(z) *Painter.* Painters shall be of manila rope not less than 2¾ inches in circumference, or equivalent, and of a length not less than 3 times the distance between the deck on which the lifeboat is stowed and the light draft of the vessel. For lifeboats in vessels on ocean, coastwise or Great Lakes service one of the painters shall have a long eye splice and be attached to the thwart with a toggle. The other painter shall be attached to the stem.

(aa) *Plug.* The automatic drain required in the lifeboat shall be provided with a cap or plug attached to the lifeboat by a suitable chain.

(bb) *Provisions.* Two pounds of hard bread or its approved equivalent shall be provided for each person the lifeboat is certified to carry. The provisions shall be packaged in hermetically sealed cans of an approved type. The cans shall be stowed in lockers or other compartments providing suitable protection.

(cc) *Rowlocks.* A unit, consisting of sufficient rowlocks and rowlock sockets for each oar required by Table 94.20–15

(w) plus 2 additional rowlocks. The rowlocks shall be attached to the lifeboat by separate chains so as to be available for immediate use, except that the 2 additional spare rowlocks shall be carried in the equipment locker or stowed near the stern if no locker is fitted. The rowlocks and rowlock sockets shall be distributed so as to provide the maximum amount of single banked oars practicable.

(dd) *Rudder and tiller.* The rudder and tiller shall be constructed in accordance with § 160.035–3 (t) of Subchapter Q (Specifications) of this chapter.

(ee) *Sea anchor.* The sea anchor shall be of an approved type.

(ff) *Signals, distress, floating orange smoke.* Two approved floating orange smoke distress signals, constructed in accordance with Subpart 160.022 of Subchapter Q (Specifications) of this chapter. The service use of this equipment shall be limited to three years from date of manufacture, and replacement shall be made no later than the first annual stripping, cleaning, and overhaul of the lifeboat after the date of expiration.

(gg) *Signals, distress, red hand flare.* A unit, consisting of twelve approved hand red flare distress signals in a watertight container, constructed in accordance with Subpart 160.021 or Subpart 160.023 of Subchapter Q (Specifications) of this chapter. The service use of this equipment shall be limited to three years from date of manufacture, and replacement shall be no later than the first annual stripping, cleaning, and overhaul of the lifeboat after the date of expiration.

(hh) *Signals, distress, red parachute flare.* A unit, consisting of twelve parachute red flare distress signals with an approved means of projecting them, all contained in a portable watertight container; or twelve approved hand-held rocket-propelled parachute red flare distress signals contained in a portable watertight container. Construction shall be in accordance with Subparts 160.024 and 160.028 or Subpart 160.036 of Subchapter Q (Specifications) of this chapter. The service use of this equipment shall be limited to three years from date of manufacture, and replacement shall be no later than the first annual stripping, cleaning, and overhaul of the lifeboat after the date of expiration.

(ii) *Tool kit.* The tool kit shall consist of at least the following tools contained in a suitable container:

(1) One 12-ounce ball peen hammer.
(2) One screwdriver with 6-inch blade.
(3) One pair 8-inch slip joint pliers.
(4) One 8-inch adjustable end wrench.

(jj) *Water.* (1) For each person the lifeboat is certified to carry, there shall be provided 3 quarts of drinking water consisting of nine approved hermetically sealed containers per person, constructed and filled in accordance with Subpart 160.026 of Subchapter Q (Specifications) of this chapter. The service life of this equipment shall be limited to 5 years from date of packing, and replacement shall be made no later than the first annual stripping, cleaning, and overhaul of the lifeboat after the date of expiration. Approved desalting kits capable of producing an equal amount of drinking water may be substituted for not more than one third of the drinking water required to be carried.

(2) The drinking water containers shall be stowed in drinking water tanks, lockers, or other compartments providing suitable protection.

(kk) *Whistle, signaling.* The whistle shall be of the ball-type, of corrosion-resistant construction, with a 3-foot lanyard attached, and in good working order.

(ll) *Fishing kit.* The fishing kit shall be of an approved type constructed in accordance with Subpart 160.061 of Subchapter Q (Specifications) of this chapter.

(mm) *Cover, protecting.* The protecting cover shall be of a highly visible color, and capable of protecting the occupants against injury by exposure.

(nn) *Table of lifesaving signals.* The table shall be in accordance with the provisions of Chapter V, Regulation 16, of the International Convention for Safety of Life at Sea, 1960, and shall be printed on water resistant paper.

(oo) *Desalting kit.* One or more approved desalting kits may be used as a substitute for one third of the required amount of drinking water per person, and shall be constructed in accordance with Subpart 160.058 of Subchapter Q (Specifications) of this chapter.

§ 94.20–20 Required equipment for liferafts.

(a) The liferafts for all vessels shall be equipped in accordance with Table 94.20–20(a). For a description of the items contained in this table and the units comprising the items, see the applicable paragraphs of § 94.20–25. The letter identification prefixing the item in the table corresponds to the paragraph designation in § 94.20–25.

TABLE 94.20–20(a)

Letter identification	Item identification	Ocean and coastwise	Great Lakes		Lakes, bays, and sounds; and rivers
			Vessels carrying cargo	Other vessels	
a	Boathook	1	1	1	1
b	Drinking cups	1	None	None	None
c	Jackknife	1	None	None	None
d	Lifeline	[1] 1	[1] 1	[1] 1	[1] 1
e	Matches (boxes)	1	1	None	None
f	Mirrors, signaling	2	None	None	None
g	Oars	[2] 1 unit	[2] 1 unit	[2] 1 unit	[2] 1 unit
h	Oil, storm (gallons)	1	1	None	None
i	Painter	1	1	1	1
j	Provisions (pounds per person)	2	None	None	None
k	Rowlocks	[2] 1 unit	[2] 1 unit	[2] 1 unit	[2] 1 unit
l	Sea anchor	1	1	None	None
m	Signals, distress	[2] 1 unit	[2] 1 unit	None	None
n	Water (quarts per person)	1	None	None	None
o	Water light	1	1	[4] 1	None

[1] Not required on Type A liferafts.
[2] For description of units see § 94.20–25.
[3] 1 unit here means 6 hand red flare distress signals and 6 parachute red flare distress signals with an approved means of projecting them.
[4] Required only on towing vessels of 300 gross tons and over.

(b) Inflatable liferafts shall be equipped with ocean service equipment for vessels on ocean and coastwise routes and with limited service equipment for vessels on Great Lakes, lakes, bays, sounds, and river routes in accordance with Subpart 160.051 of Subchapter Q (Specifications) of this chapter.

NOTE: Subpart 160.051 of Subchapter Q (Specifications) of this chapter requires the servicing of inflatable liferafts at approved servicing facilities. Included in the servicing at an approved servicing facility is a complete inspection of the required equipment by a marine inspector.

§ 94.20–25 Description of equipment for liferafts.

(a) *Boathooks.* Boathooks shall be of the single hook ball point type. Boathook handles shall be of clear grained white ash, or equivalent, not less than 8 feet long and 1½ inches in diameter.

(b) *Drinking cups.* Drinking cups shall be enameled and provided with ⅛-inch cotton lanyards 3 feet in length.

(c) *Jackknife.* The jackknife (with can opener) shall be of an approved type, constructed in accordance with Subpart 160.043 of Subchapter Q (Specifications) of this chapter.

(d) *Lifeline.* The lifeline shall be properly secured around the sides and ends of the liferaft, festooned in bights not longer than 3 feet, with a seine float in each bight, which float may be omitted if the line is of an inherently buoyant material and absorbs little or no water. The lifeline shall be of a size and strength not less than ⅜-inch diameter manila.

(e) *Matches.* A box of friction matches in a watertight container.

(f) *Mirrors, signaling.* Signaling mirrors shall be of an approved type.

(g) *Oars.* A unit, consisting of 4 rowing oars and one steering oar not less than 8 feet in length shall be provided for life rafts for 7 persons or more. For life rafts for 6 persons or less, a unit shall consist of 2 paddles not less than 5 feet in length.

(h) *Oil, storm.* One gallon of vegetable, fish, or animal oil shall be provided in a suitable metal container so constructed as to permit a controlled distribution of oil on the water, and so arranged that it can be attached to the sea anchor.

(i) *Painter.* Painters shall be of manila rope not less than 2¾ inches in

circumference and of a length not less than 3 times the distance between the deck on which the liferafts are stowed and the light draft of the vessel.

(j) *Provisions.* Two pounds of hard bread or its approved equivalent shall be provided for each person the life raft is certified to carry. The provisions shall be packaged in hermetically sealed cans of an approved type. The cans shall be stowed in compartments providing suitable protection.

(k) *Rowlocks.* A unit consisting of 5 rowlocks attached to the liferaft by separate chains and ready for immediate use, together with proper rowlock sockets so arranged as to provide 4 rowing positions and one steering position with the liferaft floating either side up. Rowlocks and rowlock sockets are not required on life rafts for 6 persons or less.

(l) *Sea anchor.* The sea anchor shall be constructed of good quality canvas or other satisfactory material, and shall be not less than 2 feet in diameter.

(m) *Signals, distress.* A unit, consisting of equipment as specified in subparagraphs (1) to (3) of this paragraph. The service use of this equipment shall be limited to three years from date of manufacture, and replacement shall be made no later than the first annual inspection of the vessel after the date of expiration.

(1) Twelve approved hand red flare distress signals in a watertight container and two approved floating orange smoke distress signals, constructed in accordance with Subparts 160.021 and 160.022 of Subchapter Q (Specifications) of this chapter, or

(2) Twelve approved hand red flare distress signals in a watertight container and 12 approved hand orange smoke distress signals, constructed in accordance with Subparts 160.021 and 160.037 of Subchapter Q (Specifications) of this chapter, or

(3) Twelve approved hand combination flare and smoke distress signals, constructed in accordance with Subpart 160.023 of Subchapter Q (Specifications) of this chapter.

(n) *Water.* (1) For each person the liferaft is certified to carry, there shall be provided one quart of drinking water consisting of three approved hermetically sealed containers per person, constructed and filled in accordance with Subpart 160.026 of Subchapter Q (Specifications) of this chapter. The service life of this equipment shall be limited to five years from date of packing, and replacement shall be made no later than the first annual stripping, cleaning, and overhaul of the liferaft after the date of expiration.

(2) The drinking water containers shall be stowed in compartments providing suitable protection.

(o) *Water light.* The water light shall be of an approved type, constructed in accordance with Subparts 160.012 or 161.001 of Subchapter Q (Specifications) of this chapter. The water light shall be attached to the liferaft by a 12-thread manila lanyard 3 fathoms in length.

§ 94.20–30 Required equipment for lifefloats and buoyant apparatus.

(a) The lifefloats and buoyant apparatus for all vessels shall be equipped in accordance with Table 94.20–30(a). For a description of the items contained in this table, and the units comprising the items, see the applicable paragraphs of § 94.20–35. The letter identification prefixing the item in the table corresponds to the paragraph designation in § 94.20–35.

TABLE 94.20–30(a)

Letter identification	Item	Number required for each lifefloat and buoyant apparatus		
		Ocean and coastwise	Great Lakes	Lakes, bays, sounds, and rivers
a	Boathook [1]	1	1	1
b	Lifeline	1	1	1
c	Paddles [1]	4	4	4
d	Painter	1	1	1
e	Water light [2]	1	1	None

[1] Buoyant apparatus need not be equipped with boathook or paddles.
[2] Equipment for 24 persons or less not required to have a water light.

§ 94.20–35 Description of equipment for lifefloats and buoyant apparatus.

(a) *Boathook.* Boathooks shall be of the single hook ball point type. Boathook handles shall be of clear grained white ash, or equivalent, not less than 6 feet long and 1½ inches in diameter.

(b) *Lifeline.* The lifeline shall be properly secured around the sides and ends of the lifefloat or buoyant apparatus, festooned in bights not longer than 3 feet, with a seine float in each bight, which float may be omitted if the line is of an inherently buoyant material and absorbs little or no water. The lifeline shall be of a size and strength not less than ⅜-inch diameter manila.

(c) *Paddles.* Paddles shall be not less than 5 feet long.

(d) *Painter.* (1) The painter for buoyant apparatus shall be of manila rope not less than 2 inches in circumference and of a length not less than 6 feet plus the distance between the deck on which the buoyant apparatus is stowed and the light draft of the vessel.

(2) The painter for lifefloats shall be of manila rope not less than 2¾ inches in circumference and of a length not less than 3 times the distance between the deck on which the lifefloats are stowed and the light draft of the vessel.

(e) *Water light.* The water light shall be of an approved type, constructed in accordance with Subpart 160.012 or 161.001 of Subchapter Q (Specifications) of this chapter. The water light shall be attached to the lifefloat or buoyant apparatus by a 12-thread manila lanyard 3 fathoms in length.

§ 94.20–90 Vessels contracted for prior to May 26, 1965.

(a) Vessels contracted for prior to May 26, 1965, shall meet the following requirements:

(1) Except as specifically modified by this paragraph, the requirements of §§ 94.20–5 through 94.20–35 shall be complied with insofar as the number of items of equipment and the method of stowage of the equipment is concerned. Existing items of equipment previously approved, but not meeting the applicable specifications or requirements set forth in §§ 94.20–5 through 94.20–35 may be continued in service so long as they are maintained in a good condition to the satisfaction of the Officer in Charge, Marine Inspection. All new installations or replacements shall meet the applicable specifications or requirements in this part.

(2) Lifeboats previously approved without automatic drain plugs shall have two plugs or caps attached to the lifeboat by separate chains.

(3) Decked lifeboats shall have no drain holes or plugs, but shall be equipped with two bilge pumps.

(4) On vessels certificated for ocean or coastwise service and contracted for prior to November 19, 1952, unless other approved means are provided to achieve the same purpose, three ½-inch-diameter manila grablines shall be fitted extending from gunwale to gunwale under the keel to enable persons to cling to and climb upon the upturned lifeboat. The ends of each grabline shall be securely attached to the side benches or other permanent part of the lifeboat and each grabline shall be made up with figure eight knots spaced approximately 18 inches apart in order to provide hand grips. Means shall be provided for taking up any slack in the grablines.

Subpart 94.25—Davits for Lifeboats

§ 94.25–1 Application.

(a) The provisions of this subpart, with the exception of § 94.25–90, shall apply to all vessels contracted for on or after May 26, 1965. Vessels contracted for prior to May 26, 1965, shall meet the requirements of § 94.25–90.

§ 94.25–5 General.

(a) All gravity and mechanical type davits shall be of an approved type, constructed in accordance with Subpart 160.032 of Subchapter Q (Specifications) of this chapter.

(b) Davits for lifeboats weighing in excess of 5,000 pounds when fully equipped (but without persons) shall be of the gravity type.

(c) All davits shall be so arranged that the lifeboats do not require lifting prior to being swung out, except on small vessels where such requirement is unreasonable or impracticable in the opinion of the Officer in Charge, Marine Inspection.

(d) All davits and necessary gear shall be such as to meet the requirements for the installation test set forth in Subpart 94.35. The design, arrangements, and installation shall be such as to preclude undue delay in getting lifeboats into the water, and shall be of such strength that the lifeboats can be turned out manned by a launching crew and then safely lowered with the full complement of persons and equipment, with the ship listed to 15 degrees either way and with a 10-degree trim.

(e) Radial davits, where permitted, shall comply with the following requirements:

(1) They shall be fitted with means to prevent them from being jerked from their sockets.

(2) They shall maintain a factor of safety of six based on the weight of the fully equipped and loaded lifeboat, except that the weight of the fully equipped lifeboat alone may be used where the lifeboat is launched before being loaded with people.

(3) They shall be fitted with hand gear of sufficient power to insure that the boat can be turned out against a maximum list of 15 degrees.

(4) They shall be shop tested and show no permanent set or undue stress when subjected to a load equal to 2.2 times the working load. In addition, they shall be shop tested with a load equal to 1.1 times the weight of the fully equipped lifeboat with the davit set up to simulate a 15-degree list inboard, and it shall be determined that the hand gear can adequately handle the load in this condition.

(f) Davits shall be so disposed on one or more decks as to permit the lifeboats placed under them to be safely lowered without interference from the operation of any other davits.

(g) On a vessel on which inflatable liferafts have been substituted for lifeboats, a launching device for each lifeboat to be used for rescue purposes shall be installed. Radial type davits or other means may be used in sheltered waters if acceptable to the Officer in Charge, Marine Inspection.

§ 94.25–10 Requirements for vessels in ocean or coastwise service.

(a) All vessels shall be fitted with a set of approved gravity or mechanical davits for each lifeboat carried except that on small vessels radial type davits or other means may be used if specifically approved by the Commandant.

(b) All davit installations shall have 2 lifelines fitted to a davit span. The lifelines shall be of such length as to reach the water at the lightest sea going draft with the vessel listed 15 degrees either way.

§ 94.25–15 Requirements for vessels in Great Lakes, lakes, bays, and sounds, or river service.

(a) All vessels shall be fitted with a set of approved gravity or mechanical davits for each lifeboat carried, except that on small vessels, radial type davits or other means may be used if specifically approved by the Commandant.

(b) For vessels in Great Lakes service, all davit installations shall have 2 lifelines fitted to a davit span. The lifelines shall be of such length as to reach the water at the lightest draft with the vessel listed 15 degrees either way.

§ 94.25–90 Vessels contracted for prior to May 26, 1965.

(a) Vessels contracted for prior to May 26, 1965, shall meet the following requirements:

(1) Except as specifically modified by this paragraph, the requirements of §§ 94.25–5 through 94.25–15 shall be complied with insofar as the number and general type of equipment is concerned. Existing items of equipment previously approved, but not meeting the applicable specifications or requirements set forth in §§ 94.25–5 through 94.25–15 may be continued in service so long as they are maintained in good condition to the satisfaction of the Officer in Charge, Marine Inspection. Minor repairs, alterations, and replacements may be made to the same standards as the original installation. However, all new installations or major replacements shall meet the applicable specifications or requirements.

(2) On vessels the keels of which were laid after September 1, 1941, all davits for lifeboats weighing in excess of 5,000 pounds when fully equipped (but without persons) shall be of the gravity type.

Subpart 94.30—Lifeboat Winches

§ 94.30–1 Application.

(a) The provisions of this subpart, with the exception of § 94.30–90, shall apply to all vessels contracted for on or after November 19, 1952. Vessels contracted for prior to November 19, 1952, shall meet the requirements of § 94.30–90.

§ 94.30–5 General.

(a) All lifeboat winches shall be of an approved type, constructed in accordance with Subpart 160.015 of Subchapter Q (Specifications) of this chapter.

(b) Where ice conditions are likely to be encountered, suitable fabric covers shall be provided for all lifeboat winches, so fitted over exposed mechanism, that ice formations may be readily broken adrift when necessary to operate the winch.

(c) Where lifeboat winches are used, wire falls shall be employed.

§ 94.30–10 Number and type required.

(a) Lifeboat winches shall be fitted for each set of davits on all vessels in ocean or coastwise service where the height of the deck on which lifeboats are carried exceeds 20 feet from the lightest seagoing draft.

(b) Lifeboat winches shall be used in all cases where gravity type davits are employed.

(c) Lifeboat winches for use with gravity davits shall have grooved drums of such size that there will be only one layer of wire on the drums. Lifeboat winches for use with mechanical davits need not have grooved drums, and may be designed to take more than one layer of wire.

§ 94.30–15 Installation.

(a) Lifeboat winches shall be so located that the operator can observe the movement of the lifeboat during the lowering operation. In addition, any electrical controls provided shall meet the requirements of Subpart 111.65 of Subchapter J (Electrical Engineering) of this chapter.

(b) The lead of the falls to the lifeboat winches and length and size of wire shall be in accordance with Subpart 94.33.

§ 94.30–90 Vessels contracted for prior to November 19, 1952.

(a) Vessels contracted for prior to November 19, 1952, shall meet the following requirements:

(1) Except as specifically modified by this paragraph, the requirements of §§ 94.30–5 through 94.30–15 with the exception of § 94.30–10 (a), shall be complied with insofar as the number and general type of equipment is concerned. Existing items of equipment previously approved, but not meeting the applicable specifications or requirements set forth in §§ 94.30–5 through 94.30–15 may be continued in service so long as they are maintained in good condition to the satisfaction of the Officer in Charge, Marine Inspection. However, all new installations or major replacements shall meet the applicable specifications or requirements.

(2) Existing arrangements previously approved, but not meeting the requirements of § 94.30–15 (a), need not be changed. However, new installations or major alterations should conform with such requirements where reasonable and practicable.

(3) Where lifeboat winches are used with gravity davits, the installation shall comply with the requirements contained in § 160.015–3(k) of Subchapter Q (Specifications) of this chapter for lifeboat winches.

Subpart 94.33—Blocks and Falls for Lifeboats

§ 94.33–1 Application.

(a) The provisions of this subpart, with the exception of § 94.33–90, shall apply to all vessels contracted for on or after May 26, 1965. Vessels contracted for prior to May 26, 1965, shall meet the requirements of § 94.33–90.

§ 94.33–5 General.

(a) All blocks, falls, fairleads, padeyes, shackles, links, fastenings, etc., used in connection with lifeboat gear shall be designed with a minimum factor of safety of six, based on the maximum working load.

(b) Falls shall be of such length that the lifeboat may be lowered to the water with the vessel at its lightest draft, listed 15 degrees either way.

(c) Falls, where exposed and subject to damage or fouling, shall be suitably protected.

(d) Such blocks or other fittings shall be fitted as are necessary to permit the falls to lead fair in all positions of the davits.

(e) Means for lubrication shall be provided for all moving parts of blocks, sheaves, fairleads, etc.

§ 94.33–10 Installations where lifeboat winches are used.

(a) All falls shall be of wire rope.

(b) Wire rope falls of 6 x 19 regular lay filler wire construction, prelubricated at the factory with suitable neutral wire rope lubricant, shall be accepted as standard. Any other wire rope, superior or equal to this minimum standard may be used if specifically approved.

(c) Not more than two-part falls may be used, except in special cases where three-part falls may be permitted by the Commandant.

(d) The lead sheaves to the drums shall be located so as to provide fleet angles of not more than 8 degrees for grooved drums and not more than 4 degrees for nongrooved drums. By fleet angle is meant the angle included between an imaginary line from the lead sheave perpendicular to the axis of the drum and the line formed by the wire rope when led from the lead sheave to either extremity of the drum.

(e) Sheaves shall have a diameter at the base of the groove at least equal to 12 times the diameter of the wire rope.

§ 94.33–15 Installations where lifeboat winches are not used.

(a) All falls shall be of manila rope or equivalent. Wire rope may not be used.

(b) All vessels of over 1,000 gross tons shall be provided with covered tubs, boxes, or reels for the stowage and protection of the falls, and cruciform bitts shall be provided for properly lowering the lifeboats. Vessels of 1,000 gross tons and less shall have the falls protected from ice and ready for immediate use, and shall be provided with suitable lowering bitts or cleats.

(c) There shall be ample clearance between the cheeks of all blocks. The width between the cheeks shall be ½ inch greater than the diameter of new rope when rope of 3¾ inches circumference or greater is used. Blocks for smaller rope shall be designed with proportional clearances.

§ 94.33–90 Vessels contracted for prior to May 26, 1965.

(a) Vessels contracted for prior to May 26, 1965, shall meet the following requirements:

(1) Except as specifically modified by this paragraph, the requirements of §§ 94.33–5 through 94.33–15, as applicable, shall be complied with insofar as the general type of equipment is concerned. Existing equipment previously approved, but not meeting the detailed requirements of §§ 94.33–5 through 94.33–15 may be continued in service so long as they are maintained in good condition to the satisfaction of the Officer in Charge, Marine Inspection. Minor repairs, alterations and replacements may be made to the same standards as the original installation. However, all new installations or major replacements shall meet the applicable requirements.

Subpart 94.35—Installation of Lifeboats, Davits, and Winches

§ 94.35–1 Application.

(a) The provisions of this subpart shall apply to all installations contracted for on or after November 19, 1952, except as set forth in § 97.15–45(c) of this subchapter.

§ 94.35–5 Tests and examinations.

(a) Upon completion of installation of lifeboats, davits, or winches, tests and examinations as required by this section shall be made to the satisfaction of the inspector before the vessel may be navigated.

(b) The lifeboat shall be swung out from the chocks and lowered to the embarkation deck. At this point the lifeboat shall be loaded with deadweight equivalent to the number of persons allowed (165 pounds per person) together with weight of equipment, plus 10 percent of the total load including the weight of the lifeboat. No persons shall be permitted in the lifeboat while it is being loaded or lowered. The lifeboat shall then be lowered to the water and disengaged from the falls.

(1) None of the equipment or parts thereof nor deck connections shall show signs of permanent set or excessive deflection.

(2) Mechanical and radial type davits shall be capable of being swung out without lifting the lifeboat, except on small vessels where such requirement is unreasonable or impracticable in the opinion of the Officer in Charge, Marine Inspection.

(3) The falls shall be of sufficient length to lower the lifeboat as required by § 94.33–5(b).

(4) Where lifeboat winches are used, the following additional determinations shall be made:

(i) During lowering, the lifeboat shall be stopped at intervals of approximately six feet by the action of the counterweight alone. The counterweight shall be capable of stopping and holding the lifeboat. The brake action shall be smooth, but positive.

(ii) Brakes exposed to the weather shall be tested under the load conditions with the braking surfaces both wet and dry.

(iii) The governor brake shall be capable of controlling the speed of lowering of the fully equipped lifeboat with its complement of persons on board to not more than 120 feet per minute. In addition, the speed of lowering of the fully equipped lifeboat without its complement of persons shall be not less than 40 feet per minute.

Subpart 94.40—Life Preservers

§ 94.40–1 Application.

(a) The provisions of this subpart, with the exception of § 94.40–90, shall apply to all vessels contracted for on or after May 26, 1965. Vessels contracted for prior to May 26, 1965, shall meet the requirements of § 94.40–90.

§ 94.40–5 General.

(a) All life preservers shall be of an approved type, constructed in accordance with Subparts 160.002, 160.005, or 160.055 of Subchapter Q (Specifications) of this chapter.

(b) All life preservers on vessels on an international voyage shall be provided with a whistle of the ball-type, of corrosion-resistant construction, with a 3-foot lanyard attached, and in good working order. It shall be attached to the life preserver by the lanyard alone without hooks, snaps, clips, etc., and shall extend not less than 15 inches from the life preserver body. While stowed on the life preserver, the whistle lanyard shall be coiled and stopped-off.

§ 94.40–10 Number required.

(a) All vessels shall be provided with a life preserver for each person on board except as specifically modified by paragraph (b) of this section.

(b) For vessels in Great Lakes service of 3000 tons or over having berthing and/or working spaces forward widely separated from messing or recreational spaces aft there shall be provided in addition to those life preservers required by paragraph (a) of this section sufficient additional life preservers for 50 percent of the total number of persons on board.

(c) In addition to the life preservers required by paragraph (a) of this section, all vessels on an international voyage shall be provided with approved type life preservers for 5 percent of the persons carried. Such vessels carrying persons in addition to the crew shall be provided with life preservers suitable for children when children are aboard.

§ 94.40–15 Distribution and stowage.

(a) *Distribution.* (1) Life preservers shall be properly distributed throughout the crew quarters and other readily accessible places. If passengers are carried in addition to the crew, the additional life preservers shall be placed in the staterooms, berthings, and other places convenient for the passengers.

(2) The additional 50 percent life preservers required by § 94.40–10(b) shall be properly stowed in the vicinity of the lifeboats.

(b) *Stowage.* (1) Lockers, boxes, and closets in which life preservers are stowed shall not be capable of being locked, shall be plainly marked, and the life preservers contained therein shall be readily available.

(2) Life preservers stowed overhead shall be so supported that they can be quickly released and distributed. Where life preservers are stowed at a height greater than 7 feet from the deck below, efficient means shall be provided for their immediate release and distribution to be operated by persons standing on the deck.

§ 94.40–90 Vessels contracted for prior to May 26, 1965.

(a) Vessels contracted for prior to May 26, 1965, shall meet the following requirements:

(1) Except as specifically modified by this paragraph, the requirements of §§ 94.40–5 through 94.40–15 shall be complied with insofar as the number of items of equipment and the method of stowage is concerned. Existing items of equipment previously approved, but not meeting the applicable specifications or requirements set forth in §§ 94.40–5 through 94.40–15 may be continued in service so long as they are serviceable and in good condition to the satisfaction of the Officer in Charge, Marine Inspection, except that:

(i) All kapok and fibrous glass life preservers which do not have plastic-covered pad inserts, as required by Subparts 160.002 and 160.005 of Subchapter Q (Specifications) of this chapter, shall be removed from service.

(2) All new installations or replacements shall meet the applicable specifications or requirements, except that:

(i) Cork and balsa wood life preservers, constructed in accordance with the applicable provisions of Subpart 160.003 or 160.004 and manufactured as approved life preservers prior to July 1, 1965, may be accepted as new or replacement equipment required by this subchapter if such life preservers are serviceable and in good condition to the satisfaction of the Officer in Charge, Marine Inspection: *Provided, however,* That such life preservers bearing basic Approval No. 160.003 or 160.004 shall not be considered as approved equipment meeting the requirements for those cargo ships on an international voyage, constructed or contracted for on or after May 26, 1965.

Subpart 94.43—Ring Life Buoys and Water Lights

§ 94.43–1 Application.

(a) The provisions of this subpart, with the exception of § 94.43–90, shall apply to all vessels contracted for on or after May 26, 1965. Vessels contracted for prior to May 26, 1965, shall meet the requirements of § 94.43–90.

§ 94.43–5 General.

(a) All ring life buoys shall be of an approved type, constructed in accordance with Subpart 160.009 or 160.050 of Subchapter Q (Specifications) of this chapter.

(b) All water lights shall be of an approved type, constructed in accordance with Subparts 160.012 or 161.001 of Subchapter Q (Specifications) of this chapter.

(c) All self-activating smoke signals shall be of an approved type, constructed in accordance with the requirements of Subpart 160.057 of Subchapter Q (Specifications) of this chapter which shall be capable of producing smoke of a highly visible color for at least 15 minutes.

§ 94.43–10 Number required.

(a) The minimum number of approved 30-inch ring life buoys and the minimum number of which shall have water lights attached, shall be in accordance with Table 94.43–10(a): *Provided,* That unmanned barges are exempt from this section.

(b) One of the ring life buoys on each side of the vessel shall have secured to it a line at least 15 fathoms in length. On vessels on an international voyage, the line shall be of a buoyant type.

(c) On vessels on an international voyage, at least two of the ring life buoys with water lights attached as required by Table 94.43–10(a) shall also be provided with an approved self-activated smoke signal and shall be capable of quick release from the bridge.

TABLE 94.43-10(a)

Length of vessel in feet	Ocean[1]		All services other than ocean	
	Minimum number of ring life buoys	Minimum number of ring life buoys in column 2 which shall have water lights attached	Minimum number of ring life buoys	Minimum number of ring life buoys in column 4 which shall have water lights attached
Col. 1	Col. 2	Col. 3	Col. 4	Col. 5
Under 100	8	6	2	0
100 and under 200	8	6	4	2
200 and under 300	8	6	6	2
300 and under 400	12	6	12	4
400 and under 600	18	9	18	9
600 and under 800	24	12	24	12
800 and over	30	15	30	15

[1] Manned barges shall be equipped with 1 ring life buoy at each end of the vessel.

(d) On vessels on an international voyage, the ring life buoys required by this section shall be orange in color.

§ 94.43–15 Distribution and securing.

(a) All ring life buoys shall be placed so as to be readily accessible to the persons on board, and their positions plainly indicated so as to be known to the persons concerned.

(b) The ring life buoys shall always be capable of being cast loose, and shall not be permanently secured in any way.

§ 94.43–90 Vessels contracted for prior to May 26, 1965.

(a) Vessels contracted for prior to May 26, 1965, shall meet the following requirements:

(1) Except as specifically modified by this paragraph, the requirements of §§ 94.43–5 through 94.43–15 shall be complied with insofar as the number of items of equipment and the method of stowage is concerned. Existing items of equipment previously approved, but not meeting the applicable specifications or requirements set forth in §§ 94.43–5 through 94.43–15 may be continued in service so long as they are maintained in good condition to the satisfaction of the Officer in Charge, Marine Inspection. All new installations or replacements shall meet the applicable specifications or requirements in this subpart.

Subpart 94.45—Line-Throwing Appliances

§ 94.45–1 Application.

(a) The provisions of this subpart, with the exception of § 94.45–90, shall apply to all mechanically propelled vessels of 150 gross tons and over in ocean or coastwise service. Such vessels contracted for prior to November 19, 1952, shall meet the requirements of § 94.45–90.

§ 94.45–5 General.

(a) Line-throwing appliances of the impulse-projected rocket type, and the equipment auxiliary thereto, shall be of an approved type, constructed in accordance with Subpart 160.040 of Subchapter Q (Specifications) of this chapter. The service use of rockets shall be limited to a period of four years from date of manufacture, and replacement of out-dated items shall be made at the first port of arrival in the United States where such rockets are available, except that replacement shall be made in all cases within twelve months after the date of expiration.

(b) Line-throwing appliances of the shoulder-gun type, and the equipment auxiliary thereto, shall be of an approved type, constructed in accordance with Subpart 160.031 of Subchapter Q (Specifications) of this chapter.

§ 94.45–10 Type required.

(a) All vessels shall be fitted with an approved line-throwing appliance of the impulse-projected rocket type. However, vessels of less than 500 gross tons may substitute a line-throwing appliance of the shoulder-gun type.

§ 94.45–15 Equipment for line-throwing appliances.

(a) The equipment enumerated in this paragraph shall be carried for impulse-projected rocket type line-throwing appliances. Except as noted, the equipment and the appliance shall be stowed together in a suitable case or box:

(1) Four rockets, two of which shall be of the buoyant type.

(2) Four primer-ejector cartridges.

(3) Four service lines, each of a length not less than that specified in the approval of the appliance carried, of 7/32-inch to 9/32-inch diameter, of flax or manila, and having a breaking strength of at least 500 pounds, to be kept in faking boxes or on reels. These lines may be kept either in the box or case with the remainder of the equipment, or be stowed in an accessible location nearby.

(4) One cleaning brush, one can of oil, and twelve wiping patches.

(5) One set of instructions furnished by the manufacturer.

(6) One auxiliary line, 1,500 feet of 3-inch circumference manila. This line may be kept either in the box or case with the remainder of the equipment or be stowed in an accessible location nearby.

(b) The equipment enumerated in this paragraph shall be carried for shoulder-gun-type line-throwing appliances. Except as noted, the equipment and the appliance shall be stowed together in a suitable case or box.

(1) Ten service projectiles.

(2) Twenty-five cartridges.

(3) Four service lines, each not less than 400 feet in length, of ⅜-inch circumference flax or cotton and having a breaking strength of at least 250 pounds, or each not less than 600 feet in length of 1/16-inch or more diameter woven or braided nylon, very flexible, having a breaking strength not less than 140 pounds, or equivalent, to be kept in faking boxes or on reels. These lines may be kept either in the box or case with the remainder of the equipment or be stowed in an accessible location nearby.

(4) One cleaning rod with brush, one can of oil, and twelve wiping patches.

(5) One set of instructions furnished by the manufacturer.

(6) One auxiliary line, 500 feet of 3 inch circumference manila.

§ 94.45–20 Accessibility.

(a) The line-throwing appliance and its equipment shall be kept easily and readily accessible and ready for use. No part of this equipment shall be used for any other purpose.

§ 94.45–25 Service recommendations.

(a) In firing the line-throwing appliances, the operating instructions and safety precautions furnished by the manufacturer should be followed.

§ 94.45–90 Vessels contracted for prior to November 19, 1952.

(a) Vessels of 150 gross tons and over in ocean or coastwise service contracted for prior to November 19, 1952, shall meet the requirements set forth in §§ 94.45–5 through 94.45–25. However, if a Lyle gun-type line-throwing appliance is already in service on such vessel, it may be continued in use so long as it is in good and serviceable condition, but may not be replaced by a similar installation. Where Lyle guns are used, the following requirements shall be met:

(1) The equipment enumerated in this subparagraph shall be carried for Lyle gun type line-throwing appliances. The equipment and the gun shall be stowed together in a suitable case or box. If the case or box does not meet the requirements of Subpart 160.038 of Subchapter Q (Specifications) of this chapter for portable magazine chest, the powder and primers shall be separately stowed in a chest meeting such requirement.

(i) Six service projectiles.

(ii) Eighteen bags (2½ ounces each) of black powder marked "One-half normal charge for Lyle gun, 2½ ounces black powder" in a nonferrous metal screw-top container.

(iii) One approved firing attachment with accessories consisting of lanyard, wrench, washer to fit between barrel and shoulder of firing attachment, blank plug for screwing into gun when firing attachment is not in place, cartridge extractor, and 25 primers in a watertight metal box.

(iv) Twenty-five paper wads.

(v) Four service lines, each 1,700 feet in length, of 7/32-inch to 9/32-inch diameter flax or manila, and having a breaking strength of at least 500 pounds, to be kept in faking boxes or on reels.

(vi) One ram rod, 1 wire brush, 1 can of light petrolatum, and 12 wiping patches.

(vii) One tapered wooden plug for muzzle of gun when not in use.

(viii) One set of instructions furnished by the manufacturer of the gun.

(ix) One auxiliary line, 1,500 feet of 3-inch circumference manila.

(2) Accessibility. Same as § 94.45–20.

Subpart 94.50—Embarkation Aids

§ 94.50–1 Application.

(a) The provisions of this subpart, with the exception of § 94.50–90, shall apply to all vessels other than yachts and fishing vessels contracted for on or after May 26, 1965. Vessels contracted for prior to May 26, 1965, shall meet the requirements of § 94.50–90.

§ 94.50–5 Ladders.

(a) *General.* All ladders required by this section shall be of an approved type constructed in accordance with Subpart 160.017 of Subchapter Q (Specifications) of this chapter.

(b) *Vessels in ocean, coastwise or Great Lakes service.* (1) All vessels in ocean, coastwise or Great Lakes service shall have an approved Type II (chain suspension) ladder for each set of lifeboat davits, but existing ladders previously approved by the Coast Guard may be continued in service so long as they are maintained in good condition. Such ladders shall be kept ready and convenient for use on the lifeboat deck, and shall reach from such deck to the vessel's light water line, no heel assumed.

(2) All ocean and coastwise vessels which normally employ a pilot shall have a ladder for the use of the pilot in addition to the ladders required by subparagraph (1) of this paragraph. Suitable spreaders, a man rope, and a safety line shall be kept readily available for use in conjunction with the pilot ladder whenever circumstances may so require. When used, the ladder shall be secured in a position so that each step rests firmly against the ship's side, and so the pilot can gain safe and convenient access to the ship after climbing not more than 30 feet. Whenever the distance from sea level is more than 30 feet, access from the pilot ladder to the ship shall be by means of an accommodation ladder or other equally safe and convenient means. Arrangements shall be such that the rigging of the ladder and the embarkation and debarkation of the pilot is supervised by a responsible officer of the ship, and handholds are provided to assist the pilot to pass safely and conveniently from the head of the ladder into the ship and onto the ship's deck. At night a light shining over the side shall be available for use, and the deck at the position where the pilot boards the ship shall be adequately lighted.

§ 94.50–7 Embarkation aids into inflatable liferafts.

(a) Where inflatable liferafts are substituted for lifeboats, unless freeboard at embarkation point is such that embarkation devices are not necessary, suitable arrangements shall be made for embarkation which shall include sufficient ladders or other suitable devices to facilitate embarkation into the inflatable liferates when waterborne.

§ 94.50–10 Illumination for lifeboat launching operations.

(a) Provisions shall be made on all vessels on an international voyage and all other vessels where the lifeboat deck is more than 30 feet above the light water line, for readily and continuously available illumination from the vessel of lifeboats when alongside and in process of or immediately after being launched. Details of the illuminating system shall be in accordance with Subchapter J (Electrical Engineering) of this chapter.

§ 94.50–15 Illumination for liferaft stowage areas.

(a) For all vessels on an international voyage, suitable illumination shall be provided for the liferaft stowage areas.

§ 94.50–90 Vessels contracted for prior to May 26, 1965.

(a) Vessels contracted for prior to May 26, 1965, shall meet the following requirements:

(1) Except as specifically modified by this paragraph, the requirements of §§ 94.50–5 through 94.50–15 shall be complied with insofar as the number of items of equipment and the method of stowage is concerned. Existing items of equipment previously approved, but not meeting the applicable specifications or requirements of §§ 94.50–5 through 94.50–15 may be continued in service so long as they are maintained in good condition to the satisfaction of the Officer in Charge, Marine Inspection. All new installations or replacements shall meet the applicable specifications or requirements.

(2) The illumination for lifeboat launching operations need not meet the detailed requirements of Subchapter J (Electrical Engineering) of this chapter.

Subpart 94.55—Portable Radio Apparatus

§ 94.55–1 Required on international voyage.

(a) All vessels on an international voyage shall be provided with a portable radio apparatus complying with the requirements of the Federal Communications Commission unless at least one lifeboat on each side of the vessel is fitted with a fixed radio installation. Such portable radio shall be kept in the radioroom, chartroom, or other suitable location ready to be moved to one or other of the lifeboats in the event of an emergency.

Subpart 94.90—Ship's Distress Signals

§ 94.90–1 Application.

(a) The provisions of this subpart shall apply to all manned vessels of 150 gross tons and over as specifically noted.

§ 94.90–5 Vessels in ocean or coastwise service.

(a) All vessels in ocean and coastwise service shall carry within the pilothouse or on the navigator's bridge twelve approved hand-held rocket-propelled parachute red flare distress signals, contained in a portable watertight container, constructed in accordance with Subpart 160.036 of Subchapter Q (Specifications) of this chapter. The service use of the distress signals shall be limited to a period of three years from date of manufacture, and replacement of outdated items shall be made at the first port of arrival in the United States where such distress signals are available, except that replacement shall be made in all cases within twelve months after the date of expiration.

§ 94.90–10 Vessels in Great Lakes service.

(a) All vessels in Great Lakes service shall carry within the pilothouse or on the navigator's bridge, twelve approved hand-held red flare distress signals, contained in a portable watertight container, constructed in accordance with Subpart 160.021 or Subpart 160.023 of Subchapter Q (Specifications) of this chapter. The service use of distress signals shall be limited to a period of three years from date of manufacture, and replacement of out-dated items shall be made at the first port of arrival in the United States where such distress signals are available, except that replacement shall be made in all cases within twelve months after the date of expiration.

PART 95—FIRE PROTECTION EQUIPMENT

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95.01–5 Equipment installed but not required.

Subpart 95.05—Fire Detecting and Extinguishing Equipment, Where Required

95.05–1 Fire detecting, manual alarm, and supervised patrol systems.
95.05–5 Fire main system.
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Subpart 95.15—Carbon Dioxide Extinguishing Systems, Details

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95.15–5 Quantity, pipe sizes, and discharge rates.
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95.17–1 Application.
95.17–5 Quantity of foam required.
95.17–10 Controls.
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Subpart 95.50—Hand Portable Fire Extinguishers and Semiportable Fire Extinguishing Systems, Arrangements and Details

95.50–1 Application.
95.50–5 Classification.
95.50–10 Location.
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95.50–90 Vessels contracted for prior to November 19, 1952.

Subpart 95.60—Fire Axes

95.60–1 Application.
95.60–5 Number required.
95.60–10 Location.

AUTHORITY: The provisions of this Part 95 issued under R.S. 4405, as amended, 4462, as amended; 46 U.S.C. 375, 416. Interpret or apply R.S. 4417, as amended, 4418, as amended, 4426, as amended, 4488, as amended, sec. 10, 35 Stat. 428, as amended, 41 Stat. 305, as amended, secs. 1, 2, 49 Stat. 1544, 1545, as amended, sec. 17, 54 Stat. 166, as amended, sec. 3, 68 Stat. 675; 46 U.S.C. 391, 392, 404, 481, 395, 363, 367, 526p, 50 U.S.C. 198; E.O. 11239, July 31, 1965, 30 F.R. 9671, 3 CFR, 1965 Supp. Treasury Department Orders 120, July 31, 1950, 15 F.R. 6521; 167–14, Nov. 26, 1954, 19 F.R. 8026; CGFR 56–28, July 24, 1956, 21 F.R. 5659; 167–38, Oct. 26, 1959, 24 F.R. 8857.

Subpart 95.01—Application

§ 95.01–1 General.

(a) The provisions of this part shall apply to all vessels except as specifically noted in this part.

§ 95.01–5 Equipment installed but not required.

(a) Where fire detecting or extinguishing systems or equipment are not required, but are installed, the system or equipment and its installation shall meet the requirements of this part.

Subpart 95.05—Fire Detecting and Extinguishing Equipment, Where Required

§ 95.05–1 Fire detecting, manual alarm, and supervised patrol systems.

(a) Fire detecting, manual alarm, and supervised patrol systems are normally not required. However, if installed, whether required or not, such systems shall meet the applicable requirements of Part 76 of Subchapter H (Passenger Vessels) of this chapter.

(b) In each compartment containing explosives, and in adjacent cargo compartments, there shall be provided a smoke detecting or other suitable type fire detecting system.

§ 95.05–5 Fire main system.

(a) Fire pumps, hydrants, hose, and nozzles shall be installed on the following vessels:

(1) On all self-propelled vessels.

(2) On all barges with sleeping accommodations for more than 12 persons.

(b) The arrangements and details of the fire main system shall be as set forth in Subpart 95.10.

§ 95.05–10 Fixed fire extinguishing systems.

(a) Approved fire extinguishing systems may be used or required in locations delineated in this section on the following vessels:

(1) On all self-propelled vessels other than yachts and fishing vessels.

(2) On all barges with sleeping accommodations for more than 12 persons.

(b) A fixed carbon dioxide or other approved system shall be installed in all cargo compartments and tanks for combustible cargo, except that vessels engaged exclusively in the carriage of coal or grain in bulk need not be fitted with such system. For cargo compartments and tanks fitted with a fixed carbon dioxide or other approved system a deck foam system is not required. The provisions of this paragraph shall not apply to motorboats contracted for prior to November 19, 1952. In lieu of the carbon dioxide or other approved system, the following systems may be used or required in special cases:

(1) A fixed foam system may be used in cargo tanks.

(2) In cases where a cargo compartment is normally accessible and is considered to be a part of the working or living quarters, a water sprinkling system may be required, and the details of such system will be subject to special approval.

(3) On vessels contracted for prior to January 1, 1962, a steam smothering system may be accepted. However, although existing steam smothering systems may be repaired, replaced, or extended, no new systems contracted for on or after January 1, 1962, will be permitted.

(c) On vessels other than motorboats a fixed carbon dioxide or other approved system shall be installed in all lamp and paint lockers, oil rooms, and similar spaces. On vessels contracted for prior to January 1, 1962, a steam smothering system may be accepted in lieu of the carbon dioxide system. However, although existing steam smothering systems may be repaired, replaced, or extended, no new systems contracted for on or after January 1, 1962, will be permitted.

(d) On vessels of 1,000 gross tons and over, contracted for on or after November 19, 1952, or where conversion from coal to oil is contracted for on or after November 19, 1952, a fixed carbon dioxide, foam, or water spray system shall be installed in all spaces containing oil fired boilers, either main or auxiliary, or their fuel oil units, valves, or manifolds in the line between the settling tanks and the boilers.

(e) If a fixed fire extinguishing system is installed to protect an internal combustion propelling machinery installation, the system shall be of the carbon dioxide type.

(f) On vessels contracted for on or after November 19, 1952, where an enclosed ventilating system is installed for electric propulsion motors or generators, a fixed carbon dioxide extinguishing system shall be installed in such system.

(g) The arrangements and details of the fixed fire extinguishing systems shall be as set forth in Subparts 95.13 through 95.17.

§ 95.05–15 Hand portable fire extinguishers and semiportable fire extinguishing systems.

(a) Approved hand portable fire extinguishers and semiportable fire extinguishing systems shall be installed on all

vessels, other than unmanned barges and fishing vessels, as set forth in Subpart 95.50.

§ 95.05–20 Sand.

(a) On vessels of over 1,000 gross tons there shall be in each space containing oil fired boilers a metal receptacle containing not less than 10 cubic feet of sand, sawdust impregnated with soda, or other approved dry materials together with a scoop or shaker for distributing the same. On vessels of 1,000 gross tons or less, at least 5 cubic feet of such materials shall be similarly carried.

(b) In lieu of the requirements in paragraph (a) of this section, one B–II fire extinguisher may be substituted.

Subpart 95.10—Fire Main System, Details

§ 95.10–1 Application.

(a) The provisions of this subpart, with the exception of § 95.10–90, shall apply to all fire main installations contracted for on or after May 26, 1965. Installations contracted for prior to May 26, 1965, shall meet the requirements of § 95.10–90.

§ 95.10–5 Fire pumps.

(a) Vessels shall be equipped with independently driven fire pumps in accordance with Table 95.10–5(a).

TABLE 95.10–5 (a)

Gross tons		Minimum number of pumps	Hose and hydrant size, inches	Nozzle orifice size, inches	Length of hose, feet
Over	Not over				
-----	100	[1] 1	[1] 1½	[1] ½	[1] 50
100	1,000	1	1½	⅝	50
1,000	1,500	2	1½	⅝	50
1,500	-----	2	[2] 2½	[2] ¾	[2] 50

[1] On vessels of 65 feet in length or less, ¾-inch hose of good commercial grade together with a commercial garden hose nozzle may be used. The pump may be hand operated and the length of hose shall be sufficient to assure coverage of all parts of the vessel.

[2] 75 feet of 1½-inch hose and ⅝-inch nozzle may be used where specified by § 95.10–10 (b) for interior locations and 50 feet of 1½-inch hose may be used in exterior locations on vessels in other than ocean or coastwise service.

(b) On vessels of 1,000 gross tons and over on an international voyage, each required fire pump, while delivering water thru the fire main system at a pressure corresponding to that required by paragraph (c) of this paragraph, shall have a minimum capacity of at least two-thirds of that required for an independent bilge pump. However, in no case shall the capacity of each fire pump be less than that otherwise required by this section.

(c) Each pump shall be capable of delivering water simultaneously from the two highest outlets at a Pitot tube pressure of approximately 50 p. s. i. Where 1½-inch hose is permitted in lieu of 2½-inch hose by footnote 2 of Table 95.10–5 (a), the pump capacity shall be determined on the same basis as if 2½-inch hose had been permitted. Where ¾-inch hose is permitted by Table 95.10–5 (a), the Pitot tube pressure need be only 35 p. s. i.

(d) Fire pumps shall be fitted on the discharge side with relief valves set to relieve at 25 p. s. i. in excess of the pressure necessary to maintain the requirements of paragraph (c) of this section or 125 p. s. i., whichever is greater. Relief valves may be omitted if the pumps, operating under shut-off conditions, are not capable of developing a pressure exceeding this amount.

(e) Fire pumps shall be fitted with a pressure gage on the discharge side of the pumps.

(f) Fire pumps may be used for other purposes provided at least one of the required pumps is kept available for use on the fire system at all times. Unless specifically approved by the Commandant, no branch lines shall be connected to the fire mains for other than fire and deck wash purposes. Other discharge lines shall lead from a discharge manifold near the fire pump. In no case shall a pump having connection to an oil line be used as a fire pump.

(g) The total area of the pipes leading from a pump shall not be less than the discharge area of the pump.

(h) On vessels with oil fired boilers, either main or auxiliary, or with internal combustion propulsion machinery, where 2 fire pumps are required, they shall be located in separate spaces, and the arrangement of pumps, sea connections, and sources of power shall be such as to insure that a fire in any one space will not put all of the fire pumps out of operation. However, where it is shown to the satisfaction of the Commandant that it is unreasonable or impracticable to meet this requirement due to the size or arrangement of the vessel, or for other reasons, the installation of a total flooding carbon dioxide system may be accepted as an alternate method of extinguishing any fire which would affect the powering and operation of at least one of the required fire pumps.

§ 95.10–10 Fire hydrants and hose.

(a) The size of fire hydrants, hose, and nozzles and the length of hose required shall be as noted in Table 95.10–5(a).

(b) In lieu of the 2½-inch hose and hydrants specified in Table 95.10–5 (a), on vessels over 1,500 gross tons, the hydrants in interior locations may have siamese connections for 1½-inch hose. In these cases the hose shall be 75 feet in length, and only one hose will be required at each fire station; however, if all such stations can be satisfactorily served with 50-foot lengths, 50-foot hose may be used.

(c) On vessels of 1,000 gross tons and over there shall be at least one shore connection to the fire main available to each side of the vessel in an accessible location. Suitable cut-out valves and check valves shall be provided. Suitable adapters also shall be provided for furnishing the vessel's shore connections with couplings mating those on the shore fire lines. Such vessels on an international voyage, shall be provided with at least one international shore connection. Facilities shall be available enabling such a connection to be used on either side of the vessel. The international shore connection shall be in accordance with specification Subpart 162.034 of Subchapter Q (Specifications) of this chapter.

(d) Fire hydrants shall be of sufficient number and so located that any part of the vessel, other than main machinery spaces, accessible to persons on board while the vessel is being navigated and all cargo holds may be reached with at least 2 streams of water from separate outlets, at least one of which shall be from a single length of hose. In main machinery spaces, all portions of such spaces shall be capable of being reached by at least 2 streams of water, each of which shall be from a single length of hose from separate outlets; however, this requirement need not apply to shaft alleys containing no assigned space for the stowage of combustibles. Fire hydrants shall be numbered as required by § 97.37–15 of this subchapter.

(e) All parts of the fire main located on exposed decks shall either be protected against freezing or be fitted with cut-out valves and drain valves so that the entire exposed parts of such piping may be shut off and drained in freezing weather. Except when closed to prevent freezing, such valves shall be sealed open.

(f) The outlet at the fire hydrant shall be limited to any position from the horizontal to the vertical pointing downward, so that the hose will lead horizontally or downward to minimize the possibility of kinking.

(g) Each fire hydrant shall be provided with a single length of hose with nozzle attached and a spanner. A suitable hose rack or other device shall be provided for the proper stowage of the hose. If the hose is not stowed in the open or behind glass so as to be readily seen, the enclosure shall be marked in accordance with § 97.37–15 of this subchapter.

(h) Fire hose shall be connected to the outlets at all times. However, on open decks where no protection is afforded to the hose in heavy weather, or where the hose may be liable to damage from the handling of cargo, the hose may be temporarily removed from the hydrant and stowed in an accessible nearby location.

(i) Hose nozzles shall be as follows:

(1) All nozzles shall be of good grade bronze or equivalent metal.

(2) Where smooth bore type nozzles are used, they shall have an orifice of the size indicated in Table 95.10–5 (a).

(3) Where combination solid stream and water spray fire hose nozzles are used, they shall be of approved type. New installations and replacements shall be constructed in accordance with subpart 162.027 of subchapter Q (Specifications) of this chapter. The detachable applicator shall be stowed adjacent to the fire hydrant, except where combination nozzles are not required, in which case the applicator may be stowed at the discretion of the master.

(4) Except as noted in subparagraphs (5) and (6) of this paragraph, all hose nozzles shall be of either the smooth bore type or the approved type combination nozzle.

(5) On all vessels of 1,000 gross tons and over, the hose attached to the hydrants in propulsion machinery spaces containing oil fired boilers, internal combustion machinery, or oil fuel units shall be fitted with an approved combination nozzle. The applicator shall be not more than 6 feet in length.

(6) Where ¾-inch hose is permitted by Table 95.10–5 (a), a good commercial grade garden hose nozzle or equivalent will be accepted.

(7) Where approved combination nozzles are used, but are not required, the applicators with low velocity fog spray heads and the self-cleaning strainers may be fitted, but will not be required.

(j) Firehose shall not be used for any other purpose than fire extinguishing, drills, and testing.

(k) Fire hydrants, nozzles, and other fittings shall have threads to accommodate the hose connections noted in paragraph (l) of this section.

(l) Firehose and couplings shall be as follows:

(1) Couplings shall be of brass, bronze, or other equivalent metal. For installations on vessels contracted for on or after July 1, 1954, National Standard fire hose coupling threads shall be used for the 1½-inch and 2½-inch sizes, i. e., 9 threads per inch for 1½-inch hose and 7½ threads per inch for 2½-inch hose.

(2) Unlined hose shall not be used in the machinery spaces.

(3) Where ¾-inch hose is permitted by Table 95.10–5 (a), the hose and couplings shall be of good commercial grade.

(4) All lined and unlined hose installed after January 1, 1961, shall be of fire hose quality, in conformance with Underwriters' Laboratories, Inc., Standard 18 or 19, or Federal Specification JJ–H–571 or ZZ–H–451a. Hose which bears the label of Underwriters' Laboratories, Inc., as inspected lined or unlined fire hose will be accepted as conforming to this requirement.

§ 95.10–15 Piping.

(a) All piping, valves, and fittings shall meet the applicable requirements of Subchapter F (Marine Engineering) of this chapter.

(b) All distribution cut-off valves shall be marked as required by § 97.37–10 of this subchapter.

(c) For vessels on an international voyage, the diameter of the fire main shall be sufficient for the effective distribution of the maximum required discharge from two fire pumps operating simultaneously. This requirement is in addition to § 95.10–5(c). The discharge of this quantity of water through hoses and nozzles at a sufficient number of adjacent hydrants shall be at a minimum Pitot tube pressure of approximately 50 pounds per square inch.

§ 95.10–90 Installations contracted for prior to May 26, 1965.

(a) Installations contracted for prior to May 26, 1965, shall meet the following requirements:

(1) Except as specifically modified by this paragraph, the requirements of §§ 95.10–5 through 95.10–15 shall be complied with insofar as the number and general type of equipment is concerned. Existing equipment previously approved, but not meeting the applicable requirements of §§ 95.10–5 through 95.10–15 may be continued in service so long as they are maintained in good condition to the satisfaction of the Officer in Charge, Marine Inspection. Minor repairs, alterations, and replacements may be permitted to the same standards as the original installations. However, all new installations or major replacements shall meet the applicable requirements in this subpart.

(2) All vessels contracted for prior to November 19, 1952, other than motorboats, shall be fitted with fire pumps, hoses, and nozzles in accordance with Table 95.10–90(a)(2).

TABLE 95.10–90(a)(2)

Gross tons		Minimum number of pumps	Minimum hose and hydrant size, inches	Nozzle orifice size, inches	Length of hose, feet
Over	Not over				
-----	100	1	[1] 1½	[1] ¾	[1] 50
100	1,000	1	[2] 1½	[2] ⅝	[2] 50
1,000	----	2	[2] 1½	[2] ⅝	[2] 50

[1] On vessels of 65 feet in length or less, ¾-inch hose of good commercial grade together with a commercial garden hose nozzle may be used. The pump may be hand operated and the length of hose shall be sufficient to assure coverage of all parts of the vessel.

[2] May use 50 feet of 2½-inch hose with ¾-inch nozzles for exterior stations. 75 feet of 1½-inch hose with ¾-inch nozzles may be used for interior station in which case such interior stations shall have siamese connections.

(3) Vessels contracted for prior to July 1, 1935, need not meet the requirements of § 95.10–5(h), and vessels contracted for on or after July 1, 1935, but prior to November 19, 1952, may have a carbon dioxide "bilge" in lieu of "total flooding" system. However, in vessels of both categories where a conversion from coal to oil is contracted for on or after November 19, 1952, the provisions of § 95.10–5(h) shall apply.

(4) The general requirements of § 95.10–5 (c) through (g), § 95.10–10 (d) through (i), and § 95.10–15 shall be complied with insofar as is reasonable and practicable.

Subpart 95.13—Steam Smothering System, Details

§ 95.13–1 Application.

(a) In accordance with § 95.05–10, steam smothering systems are not permitted on vessels contracted for on or after January 1, 1962, nor for new installations on vessels contracted for prior to that date.

(b) Where a steam smothering system is installed, the provisions of this subpart shall apply.

(c) This does not preclude the introduction of steam into such confined spaces as boiler casings or into tanks for steaming out purposes. Such installations are not to be considered as part of any required fire extinguishing system.

§ 95.13–90 Installations contracted for prior to January 1, 1962.

(a) Installations contracted for prior to July 1, 1935, shall meet the following requirements:

(1) Existing arrangements, materials, and facilities previously approved will be considered satisfactory so long as they meet the minimum requirements of this paragraph and they are maintained in good condition to the satisfaction of the Officer in Charge, Marine Inspection. Minor repairs and alterations may be made to the same standard as the original installation.

(2) The main pipes and their branches to the cargo compartments and similar spaces shall be not less than 1½-inch pipe size and shall emanate from not more than two stations in easily accessible locations. If located on the open deck, the distribution manifolds shall be suitably protected by an enclosing cabinet or casing which shall be marked as required by § 97.37–13 of this subchapter. Each branch line shall have a valve at the manifold which shall be marked as required by § 97.37–10 of this subchapter.

(3) Branches to paint lockers and similar small spaces may be taken from the nearest steam supply line and shall be not less than ¾-inch pipe size. The valve shall be marked as required by § 97.37–10 of this subchapter.

(b) Installations contracted for on or after July 1, 1935, but prior to November 19, 1952, shall meet the following requirements:

(1) Existing arrangements, materials and facilities previously approved will be considered satisfactory so long as they meet the minimum requirements of this paragraph and they are maintained in good condition to the satisfaction of the Officer in Charge, Marine Inspection. Minor repairs and alterations may be made to the same standard as the original installation.

(2) Steam shall be available from the main or auxiliary boilers to provide at least one pound of steam per hour for each 50 cubic feet of gross volume of the largest compartment protected. Where reasonable and practicable, the steam pressure shall be at least 100 p. s. i.

(3) The piping system shall meet the general requirements of subparagraphs (5) through (12) of paragraph (c) of this section insofar as is reasonable and practicable.

(4) The minimum size of distribution piping and the number of branches to the various spaces shall be as given in Table 95.13–90 (b) (4) or by the following formula:

$$D=\sqrt{\frac{C}{30{,}000}} \qquad (1)$$

where:

D=Required diameter of pipe in inches.
C=Volume of compartment in cubic feet.

TABLE 95.13-90(b)(4)

Volume of compartment in cubic feet		Number of branches to compartment	Pipe size in each branch, inches
Over	Not over		
.....	30,000	1	1
30,000	46,000	1	1¼
46,000	67,000	1	1½
67,000	94,000	2	1¼
94,000	135,000	2	1½
135,000	203,000	3	1½

(5) The minimum size of the steam supply line from the boiler to the distribution manifold shall be as given by the following formula:

$$D=\sqrt{\frac{C}{60{,}000}} \qquad (2)$$

where:

D=Diameter of pipe in inches.
C=Volume of all compartments in cubic feet.

(c) Installations contracted for on or after November 19, 1952, but prior to January 1, 1962, shall meet the following requirements:

(1) Existing arrangements, materials and facilities previously approved will be considered satisfactory so long as they meet the minimum requirements of this paragraph and they are maintained in good condition to the satisfaction of the Officer in Charge, Marine Inspection. Minor repairs and alterations may be made to the same standard as the original installation.

(2) Steam shall be available from main or auxiliary boilers to provide at least 1 pound of steam per hour for each 12 cubic feet of the gross volume of the largest compartment to be protected.

(3) Although separate piping shall be led to each cargo hold and 'tween deck, for the purpose of determining the amount of steam required, a cargo compartment will be considered as the space between adjacent watertight bulkheads and from tank top or lowest deck to the deck head of the uppermost deck on which cargo may be carried. If a trunk extends beyond such deck, the trunk space shall be included. Tonnage openings shall be considered as sealed for this purpose.

(4) A steam pressure of at least 100 p.s.i. shall be available unless specifically approved otherwise.

(5) All piping, valves, and fittings shall meet the applicable requirements of Subchapter F (Marine Engineering) of this chapter.

(6) The distribution piping shall emanate from not more than three stations in easily accessible locations on the weather deck, and shall lead to the lower portion of each cargo hold, cargo 'tween deck, and other compartments protected. However, lines to paint lockers and similar small spaces may be taken from the nearest steam supply line.

(7) The distribution line to each compartment shall be fitted with a shutoff valve. The valve shall be marked as required by § 97.37-10 of this subchapter.

(8) The manifold steam supply line shall be fitted with a master valve at the manifold.

(9) Provisions shall be made for draining the manifold and distribution lines to prevent them from freezing.

(10) If located on the open deck, the distribution manifolds shall be suitably protected by an enclosing cabinet or casing. In any case, it shall be marked as required by § 97.37-13 of this subchapter.

(11) Piping shall not be led into or through spaces accessible to the persons on board while the vessel is being navigated, with the exception of machinery spaces and corridors. However, in special cases, arrangements to run piping through such spaces may be specifically approved by the Commandant, provided all joints are welded, suitable expansion bends are provided, and all piping is extra heavy.

(12) Piping shall be used for no other purposes except that it may be incorporated with the fire-detecting system, if installed, and where suitable provisions are made, it may be used for steaming out tanks.

(13) The minimum size and number of branches to the various spaces shall be as given in Table 95.13-90(c)(13). The distribution piping from the manifold to the branch lines shall have an area approximately equal to the combined areas of the branch lines served.

TABLE 95.13-90(c)(13)

Volume of space in cubic feet		Number of branches to space	Pipe size of each branch, inches
Over	Not over		
.....	500	1	¾
500	5,000	1	1
5,000	15,000	1	1¼
15,000	30,000	1	1½
30,000	60,000	2	1½
60,000	100,000	3	1½
100,000	190,000	4	1½

(14) The steam supply line from the boiler to any distribution manifold shall be of sufficient size to supply all the branch lines to the largest compartment and to all adjacent compartments.

Subpart 95.15—Carbon Dioxide Extinguishing Systems, Details

§ 95.15-1 Application.

(a) Where a carbon dioxide extinguishing system is installed, the provisions of this subpart, with the exception of § 95.15-90, shall apply to all installations contracted for on or after November 19, 1952. Installations contracted for prior to November 19, 1952, shall meet the requirements of § 95.15-90.

(b) The requirements of this subpart are based on a "high pressure system," i. e., one in which the carbon dioxide is stored in liquid form at atmospheric temperature. Details for "low pressure systems," i. e., those in which the carbon dioxide is stored in liquid form at a continuously controlled low temperature, may be specifically approved by the Commandant where it is demonstrated that a comparable degree of safety and fire extinguishing ability is achieved.

§ 95.15-5 Quantity, pipe sizes, and discharge rates.

(a) *General.* The amount of carbon dioxide required for each space shall be as determined by paragraphs (b) through (e) of this section.

(b) *Total available supply.* A separate supply of carbon dioxide need not be provided for each space protected. The total available supply shall be at least sufficient for the space requiring the greatest amount.

(c) *Cargo spaces.* (1) The number of pounds of carbon dioxide required for each space shall be equal to the gross volume of the space in cubic feet divided by 30.

(2) Although separate piping shall be led to each cargo hold and 'tween deck, for the purpose of determining the amount of carbon dioxide required, a cargo compartment will be considered as the space between watertight or fire-screen bulkheads and from the tank top or lowest deck to the deck head of the uppermost space on which cargo may be carried. If a trunk extends beyond such deck, the trunk volume shall be included. Tonnage openings shall be considered as sealed for this purpose.

(3) Branch lines to the various cargo holds and 'tween decks shall not be less than ¾-inch standard pipe size.

(4) No specific discharge rate need be applied to such systems.

(d) *Enclosed ventilation systems for rotating electrical propulsion equipment.* (1) The number of pounds of carbon dioxide required for the initial charge shall be equal to the gross volume of the system divided by 10 for systems having a volume of less than 2,000 cubic feet, and divided by 12 for systems having a volume of 2,000 cubic feet or more.

(2) The piping for the initial charge shall be in accordance with Table 95.15-5(e)(4), and the discharge of the required amount shall be completed within 2 minutes.

(3) In addition to the above there shall be sufficient carbon dioxide available to permit delayed discharges of such quantity as to maintain at least a 25 percent concentration until the equipment can be stopped. If the initial discharge is such as to achieve this concentration until the equipment is stopped, no delayed discharge need be provided.

(4) The piping for the delayed discharge shall not be less than ½-inch standard pipe, and no specific discharge rate need be applied to such systems. On small systems, this pipe may be incorporated with the initial discharge piping.

(e) *Machinery spaces, paint lockers, tanks, and similar spaces.* (1) Except as provided in subparagraph (3) of this paragraph, the number of pounds of carbon dioxide required for each space shall be equal to the gross volume of the space divided by the appropriate factor noted in Table 95.15-5(e)(1). If fuel can drain from the compartment

being protected to an adjacent compartment, or if the compartments are not entirely separate, the requirements for both compartments shall be used to determine the amount of carbon dioxide to be provided. The carbon dioxide shall be arranged to discharge into both such compartments simultaneously.

TABLE 95.15-5(e)(1)

Gross volume of compartment, cubic feet		Factor
Over—	Not over—	
------	500	15
500	1,600	16
1,600	4,500	18
4,500	50,000	20
50,000	--------	22

(2) For the purpose of the requirements of this paragraph, the volume of the machinery space shall be taken as exclusive of the normal machinery casing unless the boiler, internal combustion machinery, or fuel oil installation extend into such space, in which case the volume shall be taken to the top of the casing or the next material reduction in casing area, whichever is lower. For installations contracted for on or after October 1, 1959, "normal machinery casing" and "material reduction in casing area" shall be defined as follows:

(i) By "normal machinery casing" shall be meant a casing the area of which is not more than 40 percent of the maximum area of the machinery space.

(ii) By "material reduction in casing area" shall be meant a reduction to at least 40 percent of the casing area.

(3) For vessels on an international voyage contracted for on or after May 26, 1965, the amount of carbon dioxide required for a space containing propulsion boilers or internal combustion propulsion machinery shall be as given by subparagraphs (1) and (2) of this paragraph or by dividing the entire volume, including the casing, by a factor of 25, whichever is the larger.

(4) Branch lines to the various spaces shall be as noted in Table 95.15-5(e)(4).

TABLE 95.15-5(e)(4)

Maximum quantity of carbon dioxide required, pounds	Minimum pipe size, inches	Maximum quantity of carbon dioxide required, pounds	Minimum pipe size, inches
100	1¼	2,500	2½
225	1½	4,450	3
300	1	7,100	3½
600	1¼	10,450	4
1,000	1½	15,000	4½
2,450	2		

(5) Distribution piping within the space shall be proportioned from the supply line to give proper distribution to the outlets without throttling.

(6) The number, type, and location of discharge outlets shall be such as to give a uniform distribution throughout the space.

(7) The total area of all discharge outlets shall not exceed 85 percent nor be less than 35 percent of the nominal cylinder outlet area or the area of the supply pipe, whichever is smaller. The nominal cylinder outlet area in square inches shall be determined by multiplying the factor 0.0022 by the number of pounds of carbon dioxide required, except that in no case shall this outlet area be less than 0.110 square inches.

(8) The discharge of at least 85 percent of the required amount of carbon dioxide shall be complete within 2 minutes.

§ 95.15-10 Controls.

(a) Except as noted in § 95.15-20(b) all controls and valves for the operation of the system shall be outside the space protected, and shall not be located in any space that might be cut off or made inaccessible in the event of fire in any of the spaces protected.

(b) If the same cylinders are used to protect more than one hazard, a manifold with normally closed stop valves shall be used to direct the carbon dioxide into the proper space. If cylinders are used to protect only one hazard, a normally closed stop valve shall be installed between the cylinders and the hazard except for systems of the type indicated in § 95.15-5(e) which contain not more than 300 pounds of carbon dioxide.

(c) Distribution piping to the various cargo spaces shall be controlled from not more than two stations. One of the stations controlling the system for the main machinery space shall be located as convenient as practicable to one of the main escapes from the space. All control stations and the individual valves and controls shall be marked as required by §§ 97.37-10 and 97.37-13 of this subchapter.

(d) Systems of the type indicated in § 95.15-5(e) shall be actuated by one control operating the valve to the space and a separate control releasing at least the required amount of carbon dioxide. These two controls shall be located in a box or other enclosure clearly identified for the particular space. Those systems installed without a stop valve shall be operated by one control releasing at least the required amount of carbon dioxide.

(e) Where provisions are made for the simultaneous release of a given amount of carbon dioxide by operation of a remote control, provisions shall also be made for manual control at the cylinders. Where gas pressure from pilot cylinders is used as a means for releasing the remaining cylinders, not less than two pilot cylinders shall be used for systems consisting of more than two cylinders. Each of the pilot cylinders shall be capable of manual control at the cylinder, but the remaining cylinders need not be capable of individual manual control.

(f) Systems of the type indicated in § 95.15-5(e), other than systems for tanks, which are of more than 300 pounds of carbon dioxide, shall be fitted with an approved delayed discharge so arranged that the alarm will be sounded for at least 20 seconds before the carbon dioxide is released into the space. Such systems of not more than 300 pounds of carbon dioxide shall also have a similar delayed discharge, except for those systems for tanks and for spaces which have a suitable horizontal escape. This paragraph shall be applicable only to systems installed on or after July 1, 1957.

(g) All distribution valves and controls shall be of an approved type. All controls shall be suitably protected.

(h) Complete but simple instructions for the operation of the system shall be located in a conspicuous place at or near the releasing control device.

(i) If the space or enclosure containing the carbon dioxide supply or controls is to be locked, a key to the space or enclosure shall be in a break-glass-type box conspicuously located adjacent to the opening.

§ 95.15-15 Piping.

(a) The piping, valves, and fittings shall have a bursting pressure of not less than 6,000 pounds per square inch.

(b) All piping, in nominal sizes not over ¾ inch shall be at least Schedule 40 (standard weight) and in nominal sizes over ¾ inch, shall be at least Schedule 80 (extra heavy).

(c) All piping, valves, and fittings of ferrous materials shall be protected inside and outside against corrosion unless specifically approved otherwise by the Commandant.

(d) A pressure relief valve or equivalent set to relieve between 2,400 and 2,800 pounds per square inch shall be installed in the distributing manifold or such other location as to protect the piping in the event that all branch line shut-off valves are closed.

(e) All dead-end lines shall extend at least 2 inches beyond the last orifice and shall be closed with cap or plug.

(f) All piping, valves, and fittings shall be securely supported, and where necessary, protected against injury.

(g) Drains and dirt traps shall be fitted where necessary to prevent the accumulation of dirt or moisture. Drains and dirt traps shall be located in accessible locations where possible.

(h) Piping shall be used for no other purpose except that it may be incorporated with the fire-detecting system.

(i) Piping passing through living quarters shall not be fitted with drains or other openings within such spaces.

(j) Installation test requirements are:

(1) Upon completion of the piping installation, and before the cylinders are connected, a pressure test shall be applied as set forth in this paragraph. Only carbon dioxide or other inert gas shall be used for this test.

(2) The piping from the cylinders to the stop valves in the manifold shall be subjected to a pressure of 1,000 pounds per square inch. With no additional gas being introduced to the system, it shall be demonstrated that the leakage of the system is such as not to permit a pressure drop of more than 150 pounds per square inch per minute for a 2-minute period.

(3) The individual branch lines to the various spaces protected shall be subjected to a test similar to that described in the preceding subparagraph with the exception that the pressure used shall

be 600 pounds per square inch in lieu of 1,000 pounds per square inch. For the purpose of this test, the distribution piping shall be capped within the space protected at the first joint ahead of the nozzles.

(4) In lieu of the tests prescribed in subparagraphs (1) through (3) of this paragraph, small independent systems protecting spaces such as emergency generator rooms, lamp lockers, etc., may be tested by blowing out the piping with air at a pressure of at least 100 pounds per square inch.

§ 95.15–20 Carbon dioxide storage.

(a) Except as provided in paragraph (b) of this section, the cylinders shall be located outside the spaces protected, and shall not be located in any space that might be cut off or made inaccessible in the event of a fire in any of the spaces protected.

(b) Systems of the type indicated in § 95.15–5(e), consisting of not more than 300 pounds of carbon dioxide, may have the cylinders located within the space protected. If the cylinder stowage is within the space protected, the system shall be arranged in an approved manner to be automatically operated by a heat actuator within the space in addition to the regular remote and local controls.

(c) The space containing the cylinders shall be properly ventilated and designed to preclude an anticipated ambient temperature in excess of 130 degrees F.

(d) Cylinders shall be securely fastened and supported, and where necessary, protected against injury.

(e) Cylinders shall be so mounted as to be readily accessible and capable of easy removal for recharging and inspection. Provisions shall be available for weighing the cylinders.

(f) Where subject to moisture, cylinders shall be so installed as to provide a space of at least 2 inches between the flooring and the bottom of the cylinders.

(g) Cylinders shall be mounted in an upright position or inclined not more than 30 degrees from the vertical. However, cylinders which are fitted with flexible or bent siphon tubes may be inclined not more than 80 degrees from the vertical.

(h) Where check valves are not fitted on each independent cylinder discharge, plugs or caps shall be provided for closing outlets when cylinders are removed for inspection or refilling.

(i) All cylinders used for storing carbon dioxide shall be fabricated, tested, and marked in accordance with the regulations of the Interstate Commerce Commission as noted in § 147.04–1 of Subchapter N (Dangerous Cargoes) of this chapter.

§ 95.15–25 Discharge outlets.

(a) Discharge outlets shall be of an approved type.

§ 95.15–30 Alarms.

(a) Spaces which are protected by a carbon dioxide extinguishing system and are normally accessible to persons on board while the vessel is being navigated, other than paint and lamp lockers and similar small spaces, shall be fitted with an approved audible alarm in such spaces which will be automatically sounded when the carbon dioxide is admitted to the space. The alarm shall be conspicuously and centrally located and shall be marked as required by § 97.37–9 of this subchapter. For systems installed on or after July 1, 1957, alarms will be mandatory only for systems required to be fitted with a delayed discharge. Such alarms shall be so arranged as to sound during the 20 second delay period prior to the discharge of carbon dioxide into the space, and the alarm shall depend on no source of power other than the carbon dioxide.

§ 95.15–35 Enclosure openings.

(a) Where mechanical ventilation is provided for spaces other than cargo and similar spaces which are protected by a carbon dioxide extinguishing system, provisions shall be made so that the ventilation system is automatically shut down with the operation of the system to that space.

(b) Where natural ventilation is provided for spaces protected by a carbon dioxide extinguishing system, provisions shall be made for easily and effectively closing off the ventilation.

(c) Means shall be provided for closing all other openings to the space protected from outside such space. In this respect, relatively tight doors, shutters, or dampers shall be provided for openings in the lower portion of the space. The construction shall be such that openings in the upper portion of the space can be closed off either by permanently installed means or by the use of canvas or other material which is normally carried by the vessel.

§ 95.15–40 Pressure relief.

(a) Where necessary, relatively tight compartments such as refrigeration spaces, paint lockers, etc., shall be provided with suitable means for relieving excessive pressure accumulating within the compartment when the carbon dioxide is injected.

§ 95.15–90 Installations contracted for prior to November 19, 1952.

(a) Installations contracted for prior to November 19, 1952, shall meet the following requirements:

(1) Existing arrangments, materials, and facilities previously approved shall be considered satisfactory so long as they meet the minimum requirements of this paragraph and they are maintained in good condition to the satisfaction of the Officer in Charge, Marine Inspection. Minor repairs and alterations may be made to the same standards as the original installation.

(2) The details of the systems shall be in general agreement with §§ 95.15–5 through 95.15–40 insofar as is reasonable and practicable, with the exception of § 95.15–5(e) (1), (2) and (4) covering spaces other than cargo spaces, which systems may be installed in accordance with subparagraphs (3) through (6) of this paragraph.

(3) In boilerrooms, the bilges shall be protected by a system discharging principally below the floor plates. Perforated pipe may be used in lieu of discharge nozzles for such systems. The number of pounds of carbon dioxide shall be equal to the gross volume of the boilerroom taken to the top of the boilers divided by 36. In the event of an elevated boiler room which drains to the machinery space, the system shall be installed in the engineroom bilge and the gross volume shall be taken to the flat on which the boilers are installed.

(4) In machinery spaces where main propulsion internal combustion machinery is installed, the number of pounds of carbon dioxide required shall be equal to the gross volume of the space taken to the under side of the deck forming the hatch opening divided by 22.

(5) In miscellaneous spaces other than cargo or main machinery spaces the number of pounds of carbon dioxide required shall be equal to the gross volume of the space divided by 22.

(6) Branch lines to the various spaces other than cargo and similar spaces shall be as noted in Table 95.15–90 (a) (6). This table is based on cylinders having discharge outlets and siphon tubes of ⅜ inch diameter.

TABLE 95.15–90(a) (6)

Number of cylinders		Nominal pipe size, inches
Over	Not over	
------	2	½—standard.
2	4	¾—standard.
4	6	1—extra heavy.
6	12	1¼—extra heavy.
12	16	1½—extra heavy.
16	27	2—extra heavy.
27	39	2½—extra heavy.
39	60	3—extra heavy.
60	80	3½—extra heavy.
80	104	4—extra heavy.
104	165	5—extra heavy.

Subpart 95.17—Foam Extinguishing Systems, Details

§ 95.17–1 Application.

(a) Where a foam extinguishing system is installed, the provisions of this subpart, with the exception of § 95.17–90, shall apply to all installations contracted for on or after November 19, 1952. Installations contracted for prior to November 19, 1952, shall meet the requirements of § 95.17–90.

§ 95.17–5 Quantity of foam required.

(a) *Area protected.* (1) For machinery and similar spaces, the system shall be so designed and arranged as to spread a blanket of foam over the entire tank top or bilge of the space protected. The arrangement of piping shall be such as to give a uniform distribution over the entire area protected.

(2) Where an installation is made to protect an oil fired boiler installation on a flat which is open to or can drain to the lower engineroom or other space, both the flat and the lower space shall be protected simultaneously. The flat shall be fitted with suitable coamings on

all openings other than deck drains to properly restrain the oil and foam at that level. Other installations of a similar nature will be considered in a like manner.

(3) Where a system is installed to protect a tank, it shall be so designed and arranged as to spread a blanket of foam over the entire liquid surface of the tank within the range of usual trim. The arrangement of piping shall be such as to give a uniform distribution over the entire area protected.

(b) *Rate of application.* (1) For spaces other than tanks, the rate of discharge to foam outlets protecting the hazard shall be at least as set forth in this subparagraph.

(i) For chemical foam systems with stored "A" and "B" solutions, a total of at least 1.6 gallons per minute of the two solutions shall be discharged for each 10 square feet of area protected.

(ii) For other types of foam systems, the water rate to the dry powder generators or air foam production equipment shall be at least 1.6 gallons per minute for each 10 square feet of area protected.

(2) For tanks, the rate of discharge to foam outlets protecting the hazard shall be as set forth in subparagraph (1) of this paragraph, except that the value of 1 gallon per minute shall be substituted in both cases for the value of 1.6 gallons per minute.

(c) *Supply of foam producing material.* (1) There shall be provided a quantity of foam producing material sufficient to operate the equipment at the discharge rate specified in paragraph (b) of this section for a period of at least 3 minutes for spaces other than tanks, and for at least 5 minutes for tanks.

(d) *Separate supply of foam agent.* A separate supply of foam agent need not be provided for each space protected. The total available supply shall be at least sufficient for the space requiring the greatest amount.

(e) *Water supply for required pumps.* Where pumps are required, the water supply shall be from outside the space protected and shall in no way be dependent upon power from the space protected.

§ 95.17–10 Controls.

(a) The foam agent, its container, and all controls and valves for the operation of the system shall be of an approved type.

(b) The foam agent container and all controls and valves for the operation of the system shall be outside the space protected and shall not be located in such space as might be cut off or made inaccessible in the event of fire in any of the spaces protected. The control space shall be as convenient as practicable to one of the main escapes from the spaces protected, and shall be marked as required by § 97.37–13 of this subchapter. Where pumps are required, it shall not be necessary that they be started from the control space.

(c) Complete, but simple instructions for the operation of the system shall be located in a conspicuous place at or near the controls.

(d) The valves to the various spaces served shall be marked as required by § 97.37–10 of this subchapter.

§ 95.17–15 Piping.

(a) All piping, valves, and fittings shall meet the applicable requirements of Subchapter F (Marine Engineering) of this chapter.

(b) All piping, valves, and fittings of ferrous materials shall be protected inside and outside against corrosion unless specifically approved otherwise by the Commandant.

(c) All piping, valves, and fittings shall be securely supported, and where necessary, protected against injury.

(d) Drains and dirt traps shall be fitted where necessary to prevent the accumulation of dirt or moisture.

(e) Piping shall be used for no other purpose.

§ 95.17–20 Discharge outlets.

(a) Discharge outlets shall be of an approved type.

§ 95.17–25 Additional protection required.

(a) In order that any residual fires above the floor plates may be extinguished when a foam system is installed for the protection of spaces other than tanks, at least 2 fire hydrants, in addition to those required for the machinery space by Subpart 95.10, shall be installed outside of the machinery space entrance. Such hydrants shall be fitted with sufficient hose so that any part of the machinery space may be reached with at least 2 streams of water, and each hose shall be equipped with an approved combination nozzle, applicator, and self-cleaning strainer as described in § 95.10–10 (i) (3).

§ 95.17–90 Installations contracted for prior to November 19, 1952.

(a) Installations contracted for prior to November 19, 1952, shall meet the following requirements:

(1) Existing arrangements, materials, and facilities previously approved shall be considered satisfactory so long as they meet the minimum requirements of this paragraph and they are maintained in good condition to the satisfaction of the Officer in Charge, Marine Inspection. Minor repairs and alterations may be made to the same standards as the original installation.

(2) The details of the systems shall be in general agreement with §§ 95.17–5 through 95.17–20, with the exception of § 95.17–5 (a) (2), insofar as is reasonable and practicable. A 6-inch blanket of foam in 5 minutes for tanks and 3 minutes for other spaces will be considered as meeting the requirements of § 95.17–5.

Subpart 95.50—Hand Portable Fire Extinguishers and Semiportable Fire Extinguishing Systems; Arrangements and Details

§ 95.50–1 Application.

(a) The provisions of this subpart, with the exception of § 95.50–90, shall apply to all vessels, other than unmanned barges and fishing vessels, contracted for on or after November 19, 1952. Such vessels contracted for prior to November 19, 1952, shall meet the requirements of § 95.50–90.

§ 95.50–5 Classification.

(a) Hand portable fire extinguishers and semiportable fire extinguishing systems shall be classified by a combination letter and number symbol. The letter indicating the type of fire which the unit could be expected to extinguish, and the number indicating the relative size of the unit.

(b) The types of fire will be designated as follows:

(1) "A" for fires in ordinary combustible materials where the quenching and cooling effects of quantities of water, or solutions containing large percentages of water, are of first importance.

(2) "B" for fires in flammable liquids, greases, etc., where a blanketing effect is essential.

(3) "C" for fires in electrical equipment where the use of nonconducting extinguishing agent is of first importance.

(c) The number designations for size will start with "I" for the smallest to "V" for the largest. Sizes I and II are considered hand portable fire extinguishers and sizes III, IV, and V are considered semiportable fire extinguishing systems which shall be fitted with suitable hose and nozzle or other practicable means so that all portions of the space concerned may be covered. Examples of size graduations for some of the typical hand portable and semiportable fire extinguishing systems are set forth in Table 95.50–5 (c).

TABLE 95.50–5 (c)

Classification		Soda-acid and water, gallons	Foam, gallons	Carbon dioxide, pounds	Dry chemical, pounds
Type	Size				
A	II	2½	2½		
B	I		1¼	4	2
B	II		2½	15	10
B	III		12	35	20
B	IV		20	50	30
B	V		40	100	50
C	I			4	2
C	II			15	10

(d) All hand portable fire extinguishers and semiportable fire extinguishing systems shall have permanently attached thereto a metallic name plate giving the name of the item, the rated capacity in gallons, quarts, or pounds, the name and address of the person or firm for whom approved, and the identifying mark of the actual manufacturer.

(e) Vaporizing-liquid type fire extinguishers containing carbon tetrachloride or chlorobromomethane or other toxic vaporizing liquids shall be removed from all vessels.

§ 95.50–10 Location.

(a) Approved hand portable fire extinguishers and semiportable fire extinguishing systems shall be installed in accordance with Table 95.50–10(a). The location of the equipment shall be to the satisfaction of the Officer in Charge,

Marine Inspection. Nothing in this paragraph shall be construed as limiting the Officer in Charge, Marine Inspection, from requiring such additional equipment as he deems necessary for the proper protection of the vessel.

TABLE 95.50-10 (a)—HAND PORTABLE FIRE EXTINGUISHERS AND SEMIPORTABLE FIRE-EXTINGUISHING SYSTEMS

Space	Classification (see § 95.50-5)	Quantity and location
Safety areas [1]		
Wheelhouse or fire control room		None required.
Stairway and elevator enclosures		Do.
Communicating corridors	A-II	1 in each main corridor not more than 150 feet apart. (May be located in stairways.)
Lifeboat embarkation and lowering stations		None required.
Radio room	C-I [2]	2 in vicinity of exit.[3]
Accommodations [1]		
Staterooms, toilet spaces, public spaces, offices, lockers, isolated storerooms, and pantries, open decks, etc.		None required.
Service spaces [1]		
Galleys	B-II or C-II	1 for each 2,500 square feet or fraction thereof suitable for hazards involved.
Paint and lamp rooms	B-II	1 outside space in vicinity of exit.
Accessible baggage, mail, and specie rooms, and storerooms.	A-II	1 for each 2,500 square feet or fraction thereof located in vicinity of exits, either inside or outside the spaces.
Carpenter shop and similar spaces	A-II	1 outside the space in vicinity of exit.
Machinery spaces		
Coal-fired boilers: Bunker and boiler space		None required.
Oil-fired boilers: Spaces containing oil-fired boilers, either main or auxiliary, or their fuel-oil units.	B-II	2 required.[4]
	B-V	1 required.[4]
Internal combustion or gas turbine propelling machinery spaces.	B-II	1 for each 1,000 brake horsepower, but not less than 2 nor more than 6.[4]
	B-III	1 required.[5 7]
Electric propulsive motors or generators of open type	C-II	1 for each propulsion motor or generator unit.
Enclosed ventilating systems for motors and generators of electric propelling machinery.		None required.
Auxiliary spaces:		
Internal combustion or gas turbine	B-II	1 outside the space in vicinity of exit.[7]
Electric emergency motors or generators	C-II	1 outside the space in vicinity of exit.[8]
Steam		None required.
Trunks to machinery spaces		Do.
Fuel tanks		Do.
Cargo spaces		
Inaccessible during voyage, including trunks and cargo tanks.		None required.
Accessible during voyage		Do.

[1] For motorboats, the total number of hand portable fire extinguishers required for safety areas, accommodation spaces, and service spaces shall be 1 B-II for motorboats of less than 50 gross tons and 2 B-II for motorboats of 50 gross tons and over. Two B-I hand portable fire extinguishers may be substituted for 1 B-II.
[2] For vessels on an international voyage, substitute 1 C-II in vicinity of exit.
[3] Vessels of less than 1,000 gross tons require 1.
[4] Vessels of less than 1,000 gross tons may substitute 1 B-IV.
[5] Only 1 required for motorboats.
[6] If oil burning donkey boiler fitted in space, the B-V previously required for the protection of the boiler may be substituted. Not required where a fixed carbon dioxide system is installed.
[7] Not required on vessels of less than 300 gross tons if fuel has a flashpoint higher than 110° F.
[8] Not required on vessels of less than 300 gross tons.

(b) Semiportable fire extinguishing systems shall be located in the open so as to be readily seen.

(c) If hand portable fire extinguishers are not located in the open or behind glass so that they may be readily seen, they may be placed in enclosures together with the fire hose, provided such enclosures are marked as required by § 97.37-15 of this subchapter.

(d) Hand portable fire extinguishers and their stations shall be numbered in accordance with § 97.37-23 of this subchapter.

(e) Hand portable or semiportable extinguishers, which are required on their nameplates to be protected from freezing, shall not be located where freezing temperatures may be expected.

§ 95.50-15 Spare charges.

(a) For all vessels other than motorboats spare charges shall be carried for at least 50 percent of each size and each variety, i.e. foam, soda-acid, carbon dioxide, etc., of hand portable fire extinguisher required by § 95.50-10(a). However, if the unit is of such variety that it cannot be readily recharged by the vessel's personnel, one spare unit of the same classification shall be carried in lieu of spare charges for all such units of the same size and variety.

(b) Spare charges shall be so packaged as to minimize the hazards to personnel while recharging the units. Acid shall be contained in a Crown stopper type of bottle.

§ 95.50-90 Vessels contracted for prior to November 19, 1952.

(a) Vessels contracted for prior to November 19, 1952, shall meet the following requirements:

(1) The provisions of §§ 95.50-5 through 95.50-15 shall be met with the exception that existing installations in safety areas and service spaces may be maintained if in the opinion of the Officer in Charge, Marine Inspection, they are in general agreement with the degree of safety prescribed by Table 95.50-10 (a). In such cases, minor modifications may be made to the same standard as the original installation: *Provided*, That in no case will a greater departure from the standards of Table 95.50-10 (a) be permitted than presently exists.

Subpart 95.60—Fire Axes

§ 95.60-1 Application.

(a) The provisions of this subpart shall apply to all vessels other than motorboats.

§ 95.60-5 Number required.

(a) All vessels except barges shall carry at least the minimum number of fire axes as set forth in Table 95.60-5(a). Nothing in this paragraph shall be construed as limiting the Officer in Charge, Marine Inspection, from requiring such additional fire axes as he deems necessary for the proper protection of the vessel.

TABLE 95.60-5 (a)

Gross tons		Number of axes
Over	Not over	
------	50	1
50	200	2
200	500	4
500	1,000	6
1,000	-------	8

(b) Manned barges shall carry at least two fire axes.

§ 95.60-10 Location.

(a) Fire axes shall be distributed throughout the spaces available to persons on board so as to be most readily available in the event of emergency.

(b) If fire axes are not located in the open, or behind glass, so that they may be readily seen, they may be placed in enclosures together with the fire hose, provided such enclosures are marked as required by § 97.37-15 of this subchapter.

PART 96—VESSEL CONTROL AND MISCELLANEOUS SYSTEMS AND EQUIPMENT

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96.01-1 General.

Subpart 96.03—Marine Engineering Systems

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Subpart 96.05—Electrical Engineering and Interior Communications Systems

96.05-1 Installation and details.

Subpart 96.07—Anchors, Chains, and Hawsers

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96.13-1 Required by Federal Communications Commission.

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96.20-1 Vessels other than sailing vessels, barges, and motorboats.
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96.35-10 Fireman's outfit.
96.35-15 Stowage.
96.35-20 Spare charges.
96.35-90 Vessels contracted for prior to May 26, 1965.

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Subpart 96.01—Application

§ 96.01-1 General.

(a) The provisions of this part shall apply to all vessels except as specifically noted in this part.

Subpart 96.03—Marine Engineering Systems

§ 96.03-1 Installation and details.

(a) The installation of all systems of a marine engineering nature, together with the details of design, construction, and installation, shall be in accordance with the requirements of Subchapter F (Marine Engineering) of this chapter. Systems of this type include the following:

Steering Systems.
Bilge and Ballast Systems.
Tank Vent and Sounding Systems.
Overboard Discharges and Shell Connections.
Pipe and Pressure Systems.
Liquefied Petroleum Gas For Cooking and Heating.

Subpart 96.05—Electrical Engineering and Interior Communications Systems

§ 96.05-1 Installation and details.

(a) The installation of all systems of an electrical engineering or interior communication nature, together with the details of design, construction, and installation, shall be in accordance with the requirements of Subchapter J (Electrical Engineering) of this chapter. Systems of this type include the following:

Ship's Service Lighting and Power Systems.
Emergency Lighting and Power Systems.
General Alarm Systems.
Sound Powered Telephone and Voice Tube Communication Systems.
Engine Order Telegraph Systems.
Rudder Angle Indicator Systems.
Refrigerated Spaces Alarm Systems.
Miscellaneous Machinery Alarms and Controls.
Daylight Signaling Lamps.

Subpart 96.07—Anchors, Chains, and Hawsers

§ 96.07-1 Application.

(a) The provisions of this subpart, with the exception of § 96.07-90, shall apply to all vessels contracted for on or after November 19, 1952. Vessels contracted for prior to November 19, 1952, shall meet the requirements of § 96.07-90.

§ 96.07-5 Ocean, coastwise, or Great Lakes service.

(a) Vessels in ocean, coastwise, or Great Lakes service shall be fitted with anchors, chains, and hawsers in general agreement with the standards established by the American Bureau of Shipping, see Subpart 90.35 of this subchapter.

§ 96.07-10 Lakes, bays, and sounds, or river service.

(a) Vessels in lakes, bays and sounds, or river service shall be fitted with such ground tackle and hawsers as deemed necessary by the Officer in Charge, Marine Inspection, depending upon the size of the vessel and the waters on which it operates.

§ 96.07-90 Vessels contracted for prior to November 19, 1952.

(a) Vessels contracted for prior to November 19, 1952, shall meet the following requirements:

(1) Installations previously accepted or approved shall be considered satisfactory for the same service so long as they are maintained in good condition to the satisfaction of the Officer in Charge, Marine Inspection. If the service of the vessel is changed, the suitability of the equipment will be established by the Officer in Charge, Marine Inspection.

Subpart 96.13—Radiotelegraph and Radiotelephone

§ 96.13-1 Required by Federal Communications Commission.

(a) Radiotelegraph and radiotelephone installations are required on certain vessels. Details of the application of this requirement as well as details of the installation shall be as required by the statutes and regulations under the jurisdiction of the Federal Communications Commission.

Subpart 96.15—Radio Direction Finder

§ 96.15-1 Application.

(a) The provisions of this subpart, with the exception of § 96.15-90, shall apply to all mechanically propelled vessels of 1,600 gross tons and over in ocean service or on an international voyage contracted for on or after November 19, 1952. Such vessels contracted for prior to November 19, 1952, shall meet the requirements of § 96.15-90.

§ 96.15-5 Required by Federal Communications Commission.

(a) All vessels shall be fitted with a radio direction finder. Details of the installation shall be as required by the statutes and regulations under the jurisdiction of the Federal Communications Commission.

§ 96.15-90 Vessels contracted for prior to November 19, 1952.

(a) Vessels contracted for prior to November 19, 1952, shall meet the following requirements:

(1) Vessels of over 5,000 gross tons shall meet the requirements of § 96.15-5.

(2) Vessels of from 1,600 gross tons through 5,000 gross tons shall meet the requirements of § 96.15-5 on or before November 19, 1954.

Subpart 96.17—Navigation Lights and Shapes

§ 96.17-1 When required.

(a) All vessels and motorboats shall be equipped with navigation lights and shapes as prescribed by law and regulation.

Subpart 96.20—Whistles

§ 96.20-1 Vessels other than sailing vessels, barges, and motorboats.

(a) All vessels other than sailing vessels, barges, and motorboats, shall be equipped with an efficient whistle or similar appliance to give the necessary whistle signals required by the Rules of the Road applicable to the waters on which the vessel is navigated. The location of the whistle and operating devices shall be as follows:

(1) Means shall be provided to operate the whistle or other appliance from a position adjacent to the main steering station and from the steering station on top of the wheelhouse where such steering station is fitted. Details of the whistle operating device shall be as described in Subchapter J (Electrical Engineering) of this chapter.

(2) In general, the whistle shall be located on the forward side of or above the structure of the vessel so as to be as free of obstructions as possible. Where practicable, it shall be installed at least 6 feet above the wheelhouse, except that on vessels navigating the Western Rivers, and any vessel of less than 100 gross tons, it shall be at least 2 feet above the wheelhouse.

(3) On double ended ferry vessels and similar vessels, where steam whistles are employed, they shall be installed both forward and aft of the stacks or one such whistle on either the port or starboard side of the stack.

§ 96.20–5 Motorboats operating on the high seas.

(a) All motorboats operating on the high seas outside the navigable waters of the United States shall meet the requirements for whistles or similar appliances prescribed by § 96.20–1 for vessels other than motorboats.

(Sec. 17, 54 Stat. 166, as amended; 46 U.S.C. 526p)

§ 96.20–10 Motorboats operating on the navigable waters of the United States.

(a) Motorboats operating on the navigable waters of the United States shall be provided with an efficient whistle or other sound-producing mechanical device as set forth in Table 96.20–10 (a).

(Sec. 17, 54 Stat. 166, as amended; 46 U.S.C. 526p)

TABLE 96.20-10 (a)

Class of motorboat	Type of device
A	None.
1	Mouth, hand or power operated, capable of producing a blast of 2 seconds or more duration and audible for at least ½ mile.
2	Hand or power operated, capable of producing a blast of 2 seconds or more duration, and audible for a distance of at least 1 mile.
3	Power operated, capable of producing a blast of 2 seconds or more duration, and audible for a distance of at least 1 mile.

Subpart 96.23—Foghorns

§ 96.23–1 Vessels other than motorboats.

(a) All vessels other than motorboats shall be equipped with an efficient foghorn as prescribed by the Rules of the Road applicable to the waters on which the vessel is navigated. On vessels in ocean or coastwise service, the foghorn shall be sounded by mechanical means.

§ 96.23–5 Motorboats.

(a) All motorboats operating on the high seas outside the navigable waters of the United States shall meet the requirements for foghorns prescribed by § 96.23–1 for vessels other than motorboats.

(Sec. 17, 54 Stat. 166, as amended; 46 U.S.C. 526p.)

Subpart 96.25—Fog Sound Signal Devices

§ 96.25–1 Vessels other than motorboats.

(a) All vessels other than motorboats shall be provided with an efficient fog bell at least 8 inches in diameter. The fog bell shall be located where the sound will be least obstructed.

(b) All vessels of more than 350 feet in length shall be provided with a fog gong which will produce a sound easily distinguishable from the sound of the bell required by paragraph (a) and shall have a range of audibility approximating that of the bell. Vessels operating exclusively on the Great Lakes and the inland waters of the United States shall be exempt from this section.

§ 96.25–5 Motorboats operating on the high seas.

(a) All motorboats operating on the high seas outside the navigable waters of the United States shall meet the requirements for fog bells prescribed by § 96.25–1 for vessels other than motorboats.

(Sec. 17, 54 Stat. 166, as amended; 46 U.S.C. 526p)

§ 96.25–10 Motorboats operating on the navigable waters of the United States.

(a) When operating on the navigable waters of the United States, motorboats of Classes A and 1 are not required to carry fog bells. However, motorboats of Classes 2 and 3 operating on the navigable waters of the United States shall be provided with an efficient fog bell.

(Sec. 17, 54 Stat. 166, as amended; 46 U.S.C. 526p)

Subpart 96.27—Sounding Equipment

§ 96.27–1 When required.

(a) All mechanically propelled vessels in ocean or coastwise service of 500 gross tons and over, and all mechanically propelled vessels in Great Lakes service of 1,500 gross tons and over, except paddle wheel vessels, shall be fitted with an efficient mechanical or electronic deep-sea sounding apparatus in addition to the deep-sea hand leads. On Great Lakes vessels, a shallow water alarm may be substituted.

Subpart 96.30—Protection From Refrigerants

§ 96.30–1 Application.

(a) The provisions of this subpart, with the exception of § 96.30–90, shall apply to all vessels contracted for on or after November 19, 1952. Vessels contracted for prior to November 19, 1952, shall meet the requirements of § 96.30–90.

§ 96.30–5 General.

(a) All self-contained breathing apparatus and gas masks shall be of an approved type, constructed in accordance with Subpart 160.011 of Subchapter Q (Specifications) of this chapter.

(b) All equipment shall be maintained in an operative condition, and it shall be the responsibility of the master and chief engineer to ascertain that a sufficient number of the crew are familiar with the operation of the equipment.

§ 96.30–15 Refrigeration masks.

(a) On all vessels equipped with refrigeration, other than small unit type refrigerations of not more than 20 cubic feet capacity, a gas mask, suitable for protection against each refrigerant used, or a self-contained breathing apparatus shall be provided. The refrigeration gas masks shall be stowed convenient to, but outside of the spaces containing the refrigeration equipment.

(b) A complete recharge shall be carried for each gas mask and self-contained breathing apparatus. The spare charge shall be stowed in the same location as the equipment it is to reactivate.

§ 96.30–90 Vessels contracted for prior to November 19, 1952.

(a) Vessels contracted for prior to November 19, 1952, shall meet the following requirements:

(1) The requirements of §§ 96.30–5 through 96.30–15 shall be complied with insofar as the number of items of equipment and the method of stowage of the equipment is concerned. Existing items of equipment previously approved, but not meeting the applicable specifications set forth in § 96.30–5, may be continued in service so long as they are maintained in good condition to the satisfaction of the Officer in Charge, Marine Inspection, but all new installations or replacements shall meet the applicable specifications or requirements in this subpart.

Subpart 96.35— Fireman's Outfit

§ 96.35–1 Application.

(a) The provisions of this subpart, with the exception of § 96.35–90, shall apply to all vessels on an international voyage contracted for on or after May 26, 1965. Such vessels contracted for prior to May 26, 1965, shall meet the requirements of § 96.35–90.

§ 96.35–5 General.

(a) All flame safety lamps shall be of an approved type, constructed in accordance with Subpart 160.016 of Subchapter Q (Specifications) of this chapter.

(b) All self-contained breathing apparatus shall be of an approved type, constructed in accordance with Subpart 160.011 of Subchapter Q (Specifications) of this chapter.

(c) All flashlights shall be of an approved 3-cell explosion-proof type, constructed in accordance with Subpart 161.008 of Subchapter Q (Specifications) of this chapter.

(d) All lifelines shall be of steel or bronze wire rope. Steel wire rope shall be either inherently corrosion-resistant, or made so by galvanizing or tinning. Each end shall be fitted with a hook with keeper having throat opening which can be readily slipped over a ⅝-inch bolt. The total length of the lifeline shall be dependent upon the size and arrangement of the vessel, and more than one line may be hooked together to achieve the necessary length. No in-

dividual length of lifeline may be less than 50 feet in length. The assembled lifeline shall have a minimum breaking strength of 1,500 pounds.

(c) All equipment shall be maintained in an operative condition, and it shall be the responsibility of the master and chief engineer to ascertain that a sufficient number of the crew are familiar with the operation of the equipment.

§ 96.35–10 Fireman's outfit.

(a) A fireman's outfit shall consist of one self-contained breathing apparatus with lifeline attached, one flashlight, one flame safety lamp, and one fire ax.

(b) Every vessel shall carry at least one fireman's outfit.

§ 96.35–15 Stowage.

(a) Equipment shall be stowed in a convenient, accessible location as determined by the master, for use in case of emergency.

§ 96.35–20 Spare charges.

(a) A complete recharge shall be carried for each self-contained breathing apparatus, and a complete set of spare batteries shall be carried for each flashlight. The spares shall be stowed in the same location as the equipment it is to reactivate.

§ 96.35–90 Vessels contracted for prior to May 26, 1965.

(a) Vessels contracted for prior to May 26, 1965, shall meet the following requirements:

(1) The requirements of §§ 96.35–5 through 96.35–20 shall be complied with insofar as the number of items of equipment and the method of stowage of the equipment is concerned. Existing items of equipment previously approved, but not meeting the applicable specifications set forth in § 96.35–5, may be continued in service so long as they are maintained in good condition to the satisfaction of the Officer in Charge, Marine Inspection, but all new installations or replacements shall meet the applicable specifications or requirements.

PART 97—OPERATIONS

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Subpart 97.75—Prevention of Oil Pollution

97.75-1 Prohibited zones.

AUTHORITY: The provisions of this Part 97 issued under R.S. 4405, as amended, 4462, as amended; 46 U.S.C. 375, 416. Interpret or apply R.S. 4417, as amended, 4418, as amended, 4426, as amended, 4453, as amended, sec. 10, 35 Stat. 428, as amended, 41 Stat. 305, as amended, secs. 1, 2, 49 Stat. 1544, 1545, as amended, sec. 3, 68 Stat. 675; 46 U.S.C. 391, 392, 404, 435, 395, 363, 367, 50 U.S.C. 198; E.O. 11239, July 31, 1965, 30 F.R. 9671, 3 CFR, 1965 Supp. Treasury Department Orders 120, July 31, 1950, 15 F.R. 6521; 167-14, Nov. 26, 1954, 19 F.R. 8026; CGFR 56-28, July 24, 1956, 21 F.R. 5659, unless otherwise noted.

Subpart 97.01—Application

§ 97.01-1 General.

(a) The provisions of this part shall apply to all vessels except as specifically noted in this part.

Subpart 97.03—Statutory Penalties

§ 97.03-1 General.

(a) The marine safety and criminal statutes provide penalties for the violation of the applicable provisions of this subchapter, which penalties, depending upon the gravity of the violation, are as follows:

(1) Assessment and collection of civil monetary penalty.

(2) Criminal prosecution where no loss of life results.

(3) Criminal prosecution for manslaughter where loss of life results from violation of statute or regulation or from misconduct, negligence, or inattention to duty.

(4) Libel against vessel.

(b) In addition to the foregoing, any licensed or certificated personnel committing an act of misbehavior, negligence, unskillfulness, endangering life, violation of marine safety statutes or regulations or requirements thereunder, and incompetency shall be subject to proceedings under the provisions of 46 U. S. C. 239 and regulations thereunder (Part 137 of this chapter) with respect to suspension or revocation of license or certificate.

Subpart 97.05—Notice to Mariners and Aids to Navigation

§ 97.05-1 Duty of officers.

(a) Licensed deck officers are required to acquaint themselves with the latest information published by the Coast Guard and the United States Navy regarding aids to navigation. Neglect to do so is evidence of neglect of duty. It is desirable that vessels other than motorboats shall have available in the pilothouse for convenient reference at all times a file of the applicable Notice to Mariners.

(1) Notice to Mariners, published weekly by the Coast Guard, contains announcements and information regarding aids to navigation and charts of waters of the United States and is available for free distribution at field offices of the Coast Guard, United States Coast and Geodetic Survey field stations, and the Marine Division, Customhouse.

(2) Notice to Mariners, published weekly by the United States Navy for the correction of charts, sailing directions, light lists, and other publications, and which includes foreign waters and certain waters of the United States, is available for free distribution at the Oceanographic Office, Branch Oceanographic Offices, or any of the agencies at seaboard ports, and is also on file in the United States consulates where they may be inspected.

§ 97.05-5 Charts.

(a) All vessels, except barges, vessels operating exclusively on rivers, and motorboats other than those certificated for ocean and coastwise routes, shall have charts of the waters upon which they operate available for convenient reference at all times.

Subpart 97.07—Notice of Casualty and Voyage Records

AUTHORITY: The provisions of this Subpart 97.07 interpret or apply R.S. 4450, as amended, 4453, as amended, secs. 13, 17, 54 Stat. 165, 166, as amended, sec. 10, 18 Stat. 128, as amended; 46 U.S.C. 239, 435, 526l(c), 526p, 53 U.S.C. 361. Treasury Department Orders 167-32, Sept. 23, 1958, 23 F.R. 7605; 167-38, Oct. 26, 1959, 24 F.R. 8857.

§ 97.07-1 Notice of casualty.

(a) The owner, agent, master, or person in charge of a vessel involved in a marine casualty shall give notice as soon as possible to the nearest marine inspection office of the U.S. Coast Guard whenever the casualty results in any of the following:

(1) Damage to property in excess of $1,500.

(2) Material damage affecting the seaworthiness or efficiency of a vessel.

(3) Stranding or grounding.

(4) Loss of life.

(5) Injury causing any person to remain incapacitated for a period in excess of 72 hours; except injuries to harbor workers not resulting in death and not resulting from vessel casualty or vessel equipment casualty.

(b) The master of any nuclear vessel shall immediately inform the Commandant in the event of any accident or casualty to the nuclear vessel which may lead to an environmental hazard. The master shall also immediately inform the competent governmental authority of the country in whose waters the vessel may be in, or whose waters the vessel approaches in a damaged condition.

§ 97.07-5 Information required.

(a) The notice required by § 97.07-1 shall show the name and official number of the vessel involved, the owner or agent thereof, the nature and probable occasion of the casualty, the locality in which it occurred, the nature and extent of injury to persons and the damage to property.

§ 97.07-10 Written report.

(a) In addition to the notice required by § 97.07-1, the person in charge of the vessel shall, as soon as possible, report in writing and in person to the Officer in Charge, Marine Inspection, at the port in which the casualty occurred or nearest the port of first arrival. However, if from a distance it may be inconvenient to report in person, it may be done in writing only. The written report required for personal accident shall be made on Form CG-924E and submitted for each individual injured and each loss of life. For all other vessel casualties the written report shall be made on Form CG-2692.

(b) If filed without delay, the Form CG-924E or CG-2692 may also provide the notice required by § 97.07-1.

§ 97.07-15 Retention of records.

(a) The owner, agent, master, or other person in charge of any vessel involved in a marine casualty shall retain such voyage records of the vessel as are maintained by the vessel, such as both rough and smooth deck and engineroom logs, bell books, navigation charts, navigation work books, compass deviation cards, gyrocompass records, storage plans, record of draft, aids to mariners, radiograms sent and received, the radio log and crew and passenger lists. The owner, agent, master, or other officer in charge, shall make these records available to a duly authorized Coast Guard officer or employee for examination upon request.

§ 97.07-20 Aids to navigation.

(a) Whenever a vesel collides with a lightship, buoy, or other aid to navigation under the jurisdiction of the Coast Guard, or is connected with any such collision, it shall be the duty of the person in charge of such vessel to report the accident to the nearest Officer in Charge, Marine Inspection. No report on Form CG-2692 is required unless any of the results listed in § 97.07-1 (a) occur.

§ 97.07-25 Reports when state of war exists.

(a) During the period when a state of war exists between the United States and any foreign nation, communications in regard to casualties or accidents shall be handled with caution and the reports shall not be made by radio or by telegram.

Subpart 97.10—Persons Allowed in Pilothouse and on Navigation Bridge

§ 97.10-1 Application.

(a) The provisions of this subpart shall apply to all vessels carrying passengers.

§ 97.10–5 Persons excluded.

(a) Masters and pilots shall exclude from the pilothouse and navigator's bridge while under way, all persons not connected with the navigation of the vessel. However, inspectors of the Coast Guard, licensed officers of vessels, persons regularly engaged in learning the profession of pilot, officers of the Coast Guard, United States Navy, United States Coast and Geodetic Survey, and the Engineer Department of the United States Army, or Maritime Administration personnel, may be allowed in the pilothouse or upon the navigator's bridge upon the responsibility of the officer in charge.

Subpart 97.12—Cargo Stowage

§ 97.12–1 Bulk ores and similar cargoes.

(a) The owners or operators of general cargo vessels which carry bulk cargoes such as ore, ore concentrates, and similar cargoes shall furnish to the masters of such vessels guidance information pertaining to the safe stowage of such cargoes.

§ 97.12–5 Manual.

(a) The manual on the "Stowage of Bulk Cargoes Such as Ore, Ore Concentrates, and Similar Cargoes when carried in General Cargo Vessels," 1959,[1] printed and distributed by the National Cargo Bureau, Inc., 99 John Street, New York, N.Y., 10038, is endorsed and recognized by the Coast Guard for use in compliance with the requirements of § 97.12–1(a).

Subpart 97.13—Station Bills

AUTHORITY: The provisions of this Subpart 97.13 interpret or apply R.S. 4488, as amended; 46 U.S.C. 481. Treasury Department Order 167–38, October 26, 1959, 24 F.R. 8857.

§ 97.13–1 Application.

(a) The provisions of this subpart shall apply to all vessels of over 500 gross tons except barges.

§ 97.13–5 Master's responsibility.

(a) A station bill (muster list) shall be prepared by the master of the vessel who shall be responsible to sign such station bill and to ascertain that it is duly posted in conspicuous locations in the vessel, particularly in the crew quarters, before the vessel sails.

§ 97.13–10 Duties of crew.

(a) The station bill shall set forth the special duties and duty station of each member of the crew for the various emergencies. The duties shall, as far as possible, be comparable with the regular work of the individual. The duties shall in general include the following and in addition, such other duties shall be assigned as are necessary in the case of the particular vessel for the proper handling of the particular emergency:

(1) The closing of airports, watertight doors, scuppers, sanitary and other discharges which lead through the vessel's hull below the margin line, etc., the stopping of fans and ventilating systems, and the operation of all safety equipment.

(2) The preparation and launching of lifeboats and liferafts.

(3) The extinction of fire.

(4) The muster of passengers, if carried, which shall in general be assigned to the stewards department, and shall include the following:

(i) Warning the passengers.

(ii) Seeing that they are dressed and have put on their life preservers in a proper manner.

(iii) Assembling the passengers and directing them to the appointed stations.

(iv) Keeping order in the passageways and stairways and generally controlling the movement of the passengers.

(v) Seeing that a supply of blankets is taken to the lifeboats.

(5) The custody of the portable radio apparatus required by Subpart 94.55 of this subchapter.

§ 97.13–15 Emergency signals.

(a) The station bill shall set forth the various signals to be used for the calling of the crew to their stations and for giving instructions while at their stations. These signals shall be as set forth in this section.

(b) (1) The fire alarm signal shall be a continuous blast of the whistle for a period of not less than 10 seconds supplemented by the continuous ringing of the general alarm bells for not less than 10 seconds.

(2) For dismissal from fire alarm stations, the general alarm shall be sounded three times supplemented by three short blasts of the whistle.

(c) (1) The signal for boat stations or boat drill shall be a succession of more than six short blasts followed by one long blast of the whistle supplemented by a comparable signal on the general alarm bells.

(2) Where whistle signals are used for handling the lifeboats, they shall be as follows:

(i) To lower lifeboats, one short blast.

(ii) To stop lowering the lifeboats, two short blasts.

(3) For dismissal from boat stations, there shall be three short blasts of the whistle.

(d) In the case of river vessels, the ship's bell may be used in lieu of the whistle signals stipulated in this section.

(e) The master of any vessel may establish such other emergency signals, in addition to the above, as will provide that all officers, crew, and passengers will have positive and certain notice of the existing emergency.

§ 97.13–20 Master to instruct crew.

(a) The master shall conduct such drills and give such instructions as are necessary to insure that all hands are familiar with their duties as specified in the station bill.

Subpart 97.14—Manning of Lifeboats and Liferafts

AUTHORITY: The provisions of this Subpart 97.14 interpret or apply R.S. 4488, as amended; 46 U.S.C. 481. Treasury Department Order 167–38, October 26, 1959, 24 F.R. 8857.

§ 97.14–1 Application.

(a) The provisions of this subpart shall apply to all vessels equipped with lifeboats and/or liferafts, except unmanned barges.

§ 97.14–5 Person in command of lifeboat or liferaft.

(a) For vessels in ocean service, the master shall appoint a first and second in command of each lifeboat and each liferaft who shall be either a licensed deck officer, an able seaman, or a certificated lifeboatman.

(b) For vessels in services other than ocean service, the master shall appoint a person in command of each lifeboat and each liferaft. Except for vessels in river service, this person in command shall be either a licensed deck officer, an able seaman, or a certificated lifeboatman.

(c) The person in charge of each lifeboat or liferaft shall have a list of its crew, and shall see that the persons under his orders are acquainted with their several duties.

§ 97.14–10 Certificated lifeboatmen.

(a) Except for vessels in river service, there shall be for each lifeboat and each liferaft a number of certificated lifeboatmen equal to that specified in Table 97.14–10(a): *Provided*, That vessels required to carry sufficient lifeboats on each side to accommodate all persons on board need only carry the certificated lifeboatmen required for the manning of the lifeboats on one side.

TABLE 97.14–10(a)

Prescribed complement of lifeboat or liferaft		Minimum number of lifeboatmen	
Over	Not over	Ocean service	All services other than ocean[1]
----------	25	2	1
25	40	2	2
40	60	3	3
60	85	4	4
85	110	5	5
110	----------	6	6

[1] Certificated lifeboatmen are not required on vessels in river service.

(b) The allocation of the certificated lifeboatmen to each lifeboat and each liferaft shall be at the discretion of the master according to the circumstances.

§ 97.14–15 Motor-propelled lifeboat.

(a) The master shall assign to each motor-propelled lifeboat a man capable of working the motor.

§ 97.14–20 Lifeboat carrying a wireless and/or searchlight.

(a) The master shall assign to each lifeboat carrying a wireless and/or

[1] A copy of this manual has been filed with the Office of the Federal Register. Copies are also on file with the various Coast Guard District Commanders for reference purposes.

searchlight a man capable of operating such equipment.

Subpart 97.15—Tests, Drills, and Inspections

AUTHORITY: The provisions of this Subpart 97.15 interpret or apply R.S. 4488, as amended; 46 U.S.C. 481. Treasury Department Order 167-38, October 26, 1959, 24 F.R. 8857.

§ 97.15-1 Application.

(a) Except as specifically noted, the provisions of this subpart shall apply to all vessels other than motorboats, and to all motorboats on an international voyage. Motorboats not on an international voyage shall meet the general intent of this subpart insofar as is reasonable and practicable with the exception that the logging of information is not required.

§ 97.15-3 Steering gear, whistle, and means of communication.

(a) On all vessels making a voyage of more than 48 hours' duration, the entire steering gear, the whistle, and the means of communication between the bridge or pilothouse and the engineroom shall be examined and tested by an officer of the vessel within a period of not more than 12 hours prior to departure. On all other vessels similar examinations and tests shall be made at least once in every week.

(b) The date of the test and the condition of the equipment shall be noted in the official logbook.

§ 97.15-5 Drafts and load line markings.

(a) The master of every vessel on an ocean, coastwise, or Great Lakes voyage shall enter the drafts of the vessel, forward and aft, in the official logbook when leaving port.

(b) On vessels subject to the requirements of Subchapter E (Load Lines) of this chapter at the time of departure from port on an ocean, coastwise, or Great Lakes voyage, the master shall insert in the official logbook a statement of the position of the load line mark, port and starboard, in relation to the surface of the water in which the vessel is then floating.

(1) When an allowance for draft is made for density of the water in which the vessel is floating, this density is to be noted in the official logbook.

§ 97.15-10 Sanitation.

(a) It shall be the duty of the master and chief engineer to see that the vessel, and, in particular, the quarters are in a clean and sanitary condition. The chief engineer shall be responsible only for the sanitary condition of the engineering department.

§ 97.15-15 Examination of boilers and machinery.

(a) It shall be the duty of the chief engineer when he assumes charge of the boilers and machinery of a vessel to examine them thoroughly. If any parts thereof are in bad condition, or if the safety-valve seals are broken, the fact shall immediately be reported to the master, owner or agent, and the Officer in Charge, Marine Inspection.

§ 97.15-20 Hatches and other openings.

(a)(1) With the exception stated in subparagraph (2) of this paragraph, it shall be the responsibility of the master to assure himself that all exposed cargo hatches and other openings in the hull of his vessel are closed, made properly watertight by the use of tarpaulins, gaskets or similar devices, and in all respects properly secured for sea before leaving protected waters.

(2) A vessel engaged in a voyage exclusively on Great Lakes waters and having 6 feet or more of freeboard, measured vertically from the water's edge at the lowest point of sheer to the top of deck at the ship's side, may, at the master's discretion, omit tarpaulins on the ship's hatches from 16 May through 15 September (both dates inclusive). This exemption does not relieve the master of any responsibility for the securing and protection of his hatches during the interval of exemption and, in case of indications of bad weather or other threatening conditions, he shall not leave protected waters until the exposed cargo hatches and other openings in the hull of his vessel are properly covered, secured and protected.

(b) The openings to which this section applies are as follows:

(1) Exposed cargo hatches.

(2) Gangway, cargo and coaling ports fitted below the freeboard deck.

(3) Port lights that are not accessible during navigation including the dead lights for such port lights.

(c) Vessels which, by their design, do not require cargo hatch closing devices and to which § 45.01-20 of Subchapter E (Load Lines) of this chapter applies need not comply with the requirements of this section as to exposed cargo hatches.

(d) The master at his discretion may permit hatches or other openings to remain uncovered or open, or to be uncovered or opened for reasonable purposes such as ship's maintenance while the vessel is being navigated: *Provided*, That in his opinion existing conditions warrant such action.

(e) In the event the master employs the discretionary provisions of this section after leaving port he shall cause appropriate entries to be made in the official log or equivalent thereof setting forth the time of uncovering, opening, closing or covering of the hatches or other openings to which this section applies and the circumstances warranting the action taken.

(f) The discretionary provisions of this section shall not relieve the master of his responsibility for the safety of his vessel, her crew or cargo.

§ 97.15-25 Line-throwing appliances.

(a) On vessels fitted with a line-throwing appliance, it shall be the duty of the master to drill his crew in the use of such appliance, and require it to be fired at least once in every 3 months. Each drill shall be recorded in the vessel's official logbook. The service line shall not be used for drill purpose. The drill shall be conducted as follows:

(1) For impulse-projected rocket type, by actually firing the rocket with any flexible line of proper size and length, suitably faked or laid out.

(2) For shoulder gun type, by actually firing, using the regular cartridge and projectile with any flexible line of proper size and length, suitably faked or laid out.

(3) For Lyle gun type, by actually firing, using 2½ ounces of powder, the regular service projectile with any flexible line of proper size and length suitably faked or laid out.

§ 97.15-30 Emergency lighting and power systems.

(a) Where fitted, it shall be the duty of the master to see that the emergency lighting and power systems are operated and inspected at least once in each week that the vessel is navigated to be assured that the system is in proper operating condition.

(b) Internal combustion engine driven emergency generators shall be operated under load for at least 2 hours, at least once in each month that the vessel is navigated.

(c) Storage batteries for emergency lighting and power systems shall be tested at least once in each 6-month period that the vessel is navigated to demonstrate the ability of the storage battery to supply the emergency loads for the specified period of time.

(d) The date of the tests and the condition and performance of the apparatus shall be noted in the official log book.

§ 97.15-35 Fire and boat drills.

(a) The master shall be responsible for conducting a fire and boat drill at least once in every week. The scheduling of such drills shall be at the discretion of the Master except that at least one fire and boat drill shall be held within 24 hours of leaving a port if more than 25 percent of the crew have been replaced at that port.

(b) The fire and boat drill shall be conducted as if an actual emergency existed. All hands should report to their respective stations and be prepared to perform the duties specified in the station bill.

(1) Fire pumps shall be started and a sufficient number of outlets used to ascertain that the system is in proper working order.

(2) All rescue and safety equipment shall be brought from the emergency equipment lockers and the persons designated shall demonstrate their ability to use the equipment.

(3) All watertight doors which are in use while the vessel is under way shall be operated.

(4) Weather permitting, lifeboat covers and strongbacks shall be removed, plugs or caps put in place, boat ladders secured in position, painters led forward and tended, and other life-saving equipment prepared for use. The motor and hand-propelling gear of each lifeboat, where fitted, shall be operated for at least 5 minutes.

(5) The passengers, if carried, shall be encouraged to fully participate in

these drills and shall be instructed in the use of the life preservers.

(6) In port, every lifeboat shall be swung out, if practicable, and the unobstructed lifeboats shall be lowered to the water and the crew exercised in the use of the oars and other means of propulsion if provided for the lifeboat. Although all lifeboats may not be used in a particular drill, care shall be taken that all lifeboats are given occasional use to ascertain that all lowering equipment is in proper order and the crew properly trained. The Master shall be responsible that each lifeboat is lowered to the water at least once in each 3 months.

(7) When the vessel is under way, and weather permitting, all lifeboats shall be swung out to ascertain that the gear is in proper order.

(8) The person in charge of each lifeboat and liferaft shall have a list of its crew and shall see that the men under his command are acquainted with their duties.

(9) Lifeboat equipment shall be examined at least once a month to insure that it is complete.

(c) An entry shall be made in the vessel's official logbook relative to each fire and boat drill setting forth the date and hour, length of time of the drill, numbers on the lifeboats swung out and numbers on those lowered, the length of time that motor and hand-propelled lifeboats are operated, the number of lengths of hose used, together with a statement as to the condition of all fire and lifesaving equipment, watertight door mechanisms, valves, etc. An entry shall also be made to report the monthly examination of the lifeboat equipment. If in any week the required fire and boat drills are not held or only partial drills are held, an entry shall be made stating the circumstances and extent of the drills held.

(d) A copy of these requirements, Form CG–809, shall be framed under glass and posted in a conspicuous place about the vessel. This form may be obtained from the Officer in Charge, Marine Inspection.

§ 97.15–40 Electric power operated lifeboat winches.

(a) It shall be the duty of the master to see that all lifeboat winch control apparatus, including motor controllers, emergency switches, master switches, and limit switches, are examined at least once in each 3 months. The examination shall include the removal of drain plugs and/or the opening of drain valves in such appliances to assure that the enclosures are free of water.

(b) The date of the examination required by this section and the condition of the equipment shall be noted in the official logbook.

§ 97.15–45 Lifeboats, rescue boats, liferafts, lifefloats, and buoyant apparatus.

(a)(1) It shall be the duty of the master or person in charge to see that the lifeboats, rescue boats, liferafts, lifefloats, and buoyant apparatus are properly maintained at all times, and that all equipment for his vessel required by the regulations in this subchapter is provided, maintained, and replaced as indicated.

(2) The master shall assign to one or more officers the duty of seeing that the lifeboats, rescue boats, liferafts, lifefloats, and buoyant apparatus are at all times ready for immediate use.

(3) The decks on which lifeboats, rescue boats, liferafts, lifefloats, and buoyant apparatus are stowed shall be kept clear of cargo or any other obstructions which would interfere with the immediate launching of such equipment.

(b) Where motor-propelled lifeboats are carried, the motor of each lifeboat shall be operated in the ahead and astern position for a period of not less than 5 minutes at least once in each week.

(c) All lifeboats, rescue boats and rigid type liferafts shall be stripped, cleaned, and thoroughly overhauled at least once in every year. When lifeboats are removed from a vessel for this purpose on a rotational basis, the installation test prescribed by Subpart 94.35 of this subchapter need not be made.

(d) The fuel tanks of all motor-propelled lifeboats shall be emptied and the fuel changed at least once in every year.

(e) Vessels in ocean or coastwise service having a sufficient number of lifeboats on each side to accommodate all persons on board may care for their lifeboats at sea: *Provided*, That a number of lifeboats sufficient to accommodate all persons on board are fully equipped and ready for use at all times.

(f) Inflatable liferafts shall be serviced at an approved service facility every 12 months or not later than the next inspection for certification provided the time since date of last servicing does not exceed 15 months. Except in emergencies no servicing should be done aboard vessels.

§ 97.15–50 Radio apparatus for lifeboats.

(a) It shall be the duty of the master to require that all batteries for all fixed and portable radio apparatus for lifeboats are brought up to full charge weekly if the batteries are of a type which require recharging.

(b) In any case, the transmitter shall be tested weekly using a suitable artificial aerial.

§ 97.15–55 Requirements for fuel oil.

(a) It shall be the duty of the chief engineer to cause an entry in the log to be made of each supply of fuel oil received on board, stating the quantity received, the name of the vendor, the name of the oil producer, and the flash point (closed cup test) for which it is certified by the producer.

(b) It shall be the further duty of the chief engineer to cause to be drawn and sealed and suitably labeled at the time the supply is received on board, a half-pint sample of each lot of fuel oil. These samples shall be preserved until the particular supply of oil is exhausted.

§ 97.15–60 Firefighting equipment, general.

(a) It shall be the duty of the owner, master, or person in charge to see that the vessel's firefighting equipment is at all times ready for use and that all such equipment required by the regulations in this subchapter is provided, maintained, and replaced as indicated.

(b) It shall be the duty of the owner, master, or person in charge to require and have performed at least once in every twelve months the tests and inspections of all hand portable fire extinguishers, semiportable fire extinguishing systems, and fixed fire extinguishing systems on board, as described in Tables 91.25–20(a)(1) and 91.25–20(a)(2) in § 91.25–20 of this subchapter. The owner, master, or person in charge shall keep records of such tests and inspections showing the dates when performed, the number and/or other identification of each unit tested and inspected, and the name(s) of the person(s) and/or company conducting the tests and inspections. Such records shall be made available to the inspector upon request and shall be kept for the period of validity of the vessel's current certificate of inspection. Where practicable these records should be kept in or with the vessel's log book. The conduct of these tests and inspections does not relieve the owner, master, or person in charge of his responsibility to maintain this firefighting equipment in proper condition at all times.

Subpart 97.17—Steering Orders

§ 97.17–1 Method of communicating.

(a) All steering orders shall be given and communicated in terms of "right rudder" where it is intended that the top of the wheel, the rudder blade, and the head of the ship should go to the right, and "left rudder" where it is intended that the top of the wheel, the rudder blade, and the head of the ship should go to the left.

Subpart 97.20—Whistling

§ 97.20–1 Unnecessary whistling prohibited.

(a) The unnecessary sounding of the vessel's whistle is prohibited within any harbor limits of the United States.

Subpart 97.23—Unauthorized Lights

§ 97.23–1 Unauthorized lights prohibited.

(a) The master shall not authorize or permit the carrying of any lights not required by law that in any way will interfere with the distinguishing of the signal lights.

Subpart 97.25—Searchlights

§ 97.25–1 Improper use prohibited.

(a) No person shall flash or cause to be flashed the rays of a searchlight or other blinding light onto the bridge or into the pilothouse of any vessel under way.

Subpart 97.27—Lookouts

§ 97.27–5 Master's and officer's responsibility.

(a) Nothing in this part shall exonerate any master or officer in command from the consequences of any neglect to keep a proper lookout or to maintain a proper fire watch or from any neglect of any precaution which may be required by the ordinary practice of seamen or by the special circumstances of the case. When circumstances require it, additional watches shall be maintained to guard against fire or other danger and to give an alarm in case of accident or disaster.

§ 97.27–10 Reckless or negligent operation prohibited by law.

(a) Subsection 13(a) of the act of April 25, 1940 (46 U.S.C. 526l), reads as follows:

No person shall operate any motorboat or any vessel in a reckless or negligent manner so as to endanger the life, limb, or property of any person. To "operate" means to navigate or otherwise use a motorboat or a vessel.

Subpart 97.30—Reports of Accidents, Repairs, and Unsafe Equipment

AUTHORITY: The provisions of this Subpart 97.30 interpret or apply R.S. 4450, as amended, 4453, as amended, sec. 10, 18 Stat. 128, as amended; 46 U.S.C. 239, 435, 33 U.S.C. 361.

§ 97.30–1 Repairs to boilers and pressure vessels.

(a) Before making any repairs to boilers or unfired pressure vessels, the chief engineer shall submit a report covering the nature of the repairs to the Officer in Charge, Marine Inspection, at or nearest to the port where the repairs are to be made.

§ 97.30–5 Accidents to machinery.

(a) In the event of an accident to a boiler, unfired pressure vessel, or machinery tending to render the further use of the item unsafe until repairs are made, or if by ordinary wear such items become unsafe, a report shall be made, by the chief engineer immediately to the Officer in Charge, Marine Inspection, or if at sea immediately upon arrival at port.

§ 97.30–10 Notice required before repair.

(a) No repairs or alterations, except in an emergency, shall be made to any lifesaving or fire detecting or extinguishing equipment without advance notice to the Officer in Charge, Marine Inspection. When emergency repairs or alterations have been made, notice shall be given to the Officer in Charge, Marine Inspection, as soon as practicable.

§ 97.30–20 Breaking of safety valve seal.

(a) If at any time it is necessary to break the seal on a safety valve for any purpose, the chief engineer shall advise the Officer in Charge, Marine Inspection, at the next port of call, giving the reason for breaking the seal and requesting that the valve be examined and adjusted by an inspector.

(R.S. 4419, as amended; 46 U.S.C. 393)

Subpart 97.33—Cable Traveler

AUTHORITY: The provisions of this Subpart 97.33 interpret or apply R.S. 4488, as amended; 46 U.S.C. 481. Treasury Department Order 167–38, Oct. 26, 1959, 24 F.R. 8857.

§ 97.33–1 When required.

(a) On vessels where the distance between deck houses is more than 150 feet, a wire cable shall be stretched between the deck houses at all times when the vessel is navigating in other than protected waters. As many loose rings with lanyards shall be attached as deemed necessary by the master. In any case, a properly constructed raised catwalk or raised bridge or a below deck passage may be substituted for the required cable.

Subpart 97.34—Work Vests

AUTHORITY: The provisions of this Subpart 97.34 interpret or apply R.S. 4488, as amended, 4491, as amended; 46 U.S.C. 481, 489. Treasury Department Order 167–38, October 26, 1959, 24 F.R. 8857.

§ 97.34–1 Application.

(a) Provisions of this subpart shall apply to all vessels inspected and certificated in accordance with this subchapter.

§ 97.34–5 Approved unicellular plastic foam work vests.

(a) Buoyant work vests carried under the permissive authority of this subpart shall conform to the specifications contained in Subpart 160.053 in Subchapter Q (Specifications) of this chapter.

§ 97.34–10 Use.

(a) Approved buoyant work vests are considered to be items of safety apparel and may be carried aboard vessels to be worn by crew members when working near or over the water under favorable working conditions. They shall be used under the supervision and control of designated ship's officers. When carried, such vests shall not be accepted in lieu of any portion of the required number of approved life preservers and shall not be substituted for the approved life preservers required to be worn during drills and emergencies.

§ 97.34–15 Shipboard stowage.

(a) The approved buoyant work vests shall be stowed separately from the regular stowage of approved life preservers.

(b) The locations for the stowage of work vests shall be such as not to be easily confused with that for approved life preservers.

§ 97.34–20 Shipboard inspections.

(a) Each work vest shall be subject to examination by a marine inspector to determine its serviceability. If found to be satisfactory, it may be continued in service, but shall not be stamped by a marine inspector with a Coast Guard stamp. If a work vest is found not to be in a serviceable condition, then such work vest shall be removed from the vessel. If a work vest is beyond repair, it shall be destroyed or mutilated in the presence of a marine inspector so as to prevent its continued use as a work vest.

Subpart 97.35—Logbook Entries

§ 97.35–1 Application.

(a) Except as specifically noted, the provisions of this subpart shall apply to all vessels other than motorboats and barges. Motorboats on an international or intercoastal voyage may be required to carry a logbook in accordance with § 97.35–10.

§ 97.35–3 Logbooks and records.

(a) Under various statutes or by regulations in this subchapter, vessels engaged in all trades, with the exception of vessels engaged exclusively in trade on rivers of the United States shall have certain logbooks or records, and, when the occasion arises, it is the duty of the master or person in charge to place therein specific entries as required by law or regulations in this chapter.

(b) R.S. 4290, as amended (46 U.S.C. 201), states: "Every vessel making voyages from a port in the United States to any foreign port, or, being of the burden of 75 tons or upward, from a port on the Atlantic to a port on the Pacific, or vice versa, shall have an Official Logbook; * * *." This Official Logbook is furnished gratuitously to masters of United States' flag vessels by the Coast Guard, as Form CG–706B or CG–706C, depending upon the number of persons employed as crew. There is printed in the first several pages of this Official Logbook various acts of Congress relating to logbooks and the entries required to be made therein. When a voyage is completed, or after a specified period of time is completed, the Official Logbooks with required entries therein shall be filed with the Officer in Charge, Marine Inspection, at or nearest the port where the vessel may be.

(c) For vessels other than those required to have Official Logbooks by R.S. 4290, the owners, operators, and/or masters are to supply their own logs or records in any form desired, which will be considered to take the place of the Official Logbooks and may be used for the purpose of making entries therein as required by law or regulations in this subchapter. Such logs or records are not filed with the Officer in Charge, Marine Inspection, but shall be kept available for review by a marine inspector for a period of one year after the date to which the records refer, except for separate records of tests and inspections of firefighting equipment which shall be maintained with the vessel's logs for the period of validity of the vessel's certificate of inspection.

§ 97.35–5 Actions required to be logged.

(a) The actions and observations noted in this section shall be entered in the official log book. This section contains no requirements which are not

made in other portions of this subchapter, the items being merely grouped together for convenience.

(1) Fire and Boat Drills. Weekly. See § 97.15–35.

(2) Steering Gear, Whistle, and Means of Communication. Prior to departure. See § 97.15–3.

(3) Drafts and Load Line Markings. Prior to leaving port, ocean, coastwise, and Great Lakes services only. See § 97.15–5.

(4) Hatches and other openings. All openings and closings, or leaving port without closing. Except vessels on protected waters. See § 97.15–20.

(5) Line Throwing Appliances. Once every 3 months. See § 97.15–25.

(6) Emergency Lighting and Power Systems. Weekly and semi-annually. See § 97.15–30.

(7) Electric Power Operated Lifeboat Winches. Once every 3 months. See § 97.15–40.

(8) Fuel oil data: Upon receipt of fuel oil on board. See § 97.15–55.

(9) Cargo gear inspections: At least once a month. See § 91.37–70 of this subchapter.

§ 97.35–10 Official log entries.

(a) On vessels where an Official Logbook is required by R.S. 4290 (46 U.S.C. 201), all items relative to the crew and passengers, as well as with respect to any casualties which may occur, shall be entered in the Official Logbook as required by this law.

Subpart 97.36—Display of Plans

§ 97.36–1 When required.

(a) Barges with sleeping accommodations for more than six persons and all self-propelled vessels shall have permanently exhibited for the guidance of the officer in charge of the vessel, general arrangement plans showing for each deck the various fire retardant bulkheads together with particulars of the fire detecting, manual alarm and fire extinguishing systems, fire doors, means of ingress to the different compartments, and the ventilating systems including the positions of the dampers, the location of the remote means of stopping the fans, and the identification of the fans serving each section.

(R.S. 4488, as amended, 46 U.S.C. 481. Treasury Department Order 167–38, October 26, 1959, 24 F.R. 8857)

Subpart 97.37—Markings for Fire and Emergency Equipment, Etc.

AUTHORITY: The provisions of this Subpart 97.37 interpret or apply R.S. 4488, as amended; 46 U.S.C. 481. Treasury Department Order 167–38, October 26, 1959, 24 F.R. 8857.

§ 97.37–1 Application.

(a) The provisions of this subpart, with the exception of § 97.37–90, shall apply to all vessels contracted for on or after November 19, 1952. Vessels contracted for prior to November 19, 1952, shall meet the requirements of § 97.37–90.

§ 97.37–3 General.

(a) It is the intent of this subpart to provide such markings as are necessary for the guidance of the persons on board in case of an emergency. In any specific case, and particularly on small vessels, where it can be shown to the satisfaction of the Officer in Charge, Marine Inspection, that the prescribed markings are unnecessary for the guidance of the persons on board in case of emergency, such markings may be modified or omitted.

(b) In addition to English, all stateroom notices, directional signs, etc., shall be printed in languages appropriate to the service of the vessel or other action be taken to achieve the same purpose.

(c) Where in this subpart red letters are specified, letters of a contrasting color on a red background will be accepted.

§ 97.37–5 General alarm bell switch.

(a) The general alarm bell switch in the pilothouse shall be clearly and permanently identified by lettering on a metal plate or with a sign in red letters on a suitable background: "GENERAL ALARM."

CROSS REFERENCE: See also § 113.25–20 of Subchapter J (Electrical Engineering) of this chapter.

§ 97.37–7 General alarm bells.

(a) All general alarm bells shall be identified by red lettering at least ½ inch high: "GENERAL ALARM—WHEN BELL RINGS GO TO YOUR STATION."

§ 97.37–9 Carbon dioxide alarm.

(a) All carbon dioxide alarms shall be conspicuously identified: "WHEN ALARM SOUNDS—VACATE AT ONCE. CARBON DIOXIDE BEING RELEASED."

§ 97.37–10 Fire extinguishing system branch lines.

(a) The branch line valves of all fire extinguishing systems shall be plainly and permanently marked indicating the spaces served.

§ 97.37–13 Fire extinguishing system controls.

(a) The control cabinets or spaces containing valves or manifolds for the various fire extinguishing systems shall be distinctly marked in conspicuous red letters at least 2 inches high: "STEAM FIRE APPARATUS," "CARBON DIOXIDE FIRE APPARATUS," "FOAM FIRE APPARATUS," or "WATER SPRAY FIRE APPARATUS" as the case may be.

§ 97.37–15 Fire hose stations.

(a) Each fire hydrant shall be identified in red letters and figures at least two inches high "FIRE STATION NO. 1," "2," "3," etc. Where the hose is not stowed in the open or behind glass so as to be readily seen, this identification shall be so placed as to be readily seen from a distance.

§ 97.37–20 Self-contained breathing apparatus and gas masks.

(a) Lockers or spaces containing self-contained breathing apparatus shall be marked "SELF-CONTAINED BREATHING APPARATUS."

§ 97.37–23 Hand portable fire extinguishers.

(a) Each hand portable fire extinguisher shall be marked with a number and the location where stowed shall be marked with a corresponding number at least ½ inch high. Where only one type and size of hand portable fire extinguisher is carried, the numbering may be omitted.

§ 97.37–25 Emergency lights.

(a) All emergency lights shall be marked with a letter "E" at least ½ inch high.

§ 97.37–33 Instructions for changing steering gear.

(a) Instructions in at least ½ inch letters and figures shall be posted in the steering engine room, relating in order, the different steps to be taken in changing to the emergency steering gear. Each clutch, gear, wheel, lever, valve, or switch which is used during the changeover shall be numbered or lettered on a metal plate or painted so that the markings can be recognized at a reasonable distance. The instructions shall indicate each clutch or pin to be "in" or "out" and each valve or switch which is to be "opened" or "closed" in shifting to any means of steering for which the vessel is equipped. Instructions shall be included to line up all steering wheels and rudder amidship before changing gears.

§ 97.37–35 Rudder orders.

(a) At all steering stations, there shall be installed a suitable notice on the wheel or device or in such other position as to be directly in the helmsman's line of vision, to indicate the direction in which the wheel or device must be turned for "right rudder" and for "left rudder."

§ 97.37–37 Lifeboats.

(a) The name of the vessel shall be plainly marked or painted on each side of the bow of each lifeboat in letters not less than 3 inches high. For vessels on an international voyage, the vessel's port of registry shall be added in similar type letters.

(b) The number of each lifeboat shall be plainly marked or painted on each side of the bow of each lifeboat in figures not less than 3 inches high. The lifeboats on each side of the vessel shall be numbered from forward aft, with the odd numbers on the starboard side.

(c) The cubical contents and number of persons allowed to be carried in each lifeboat shall be plainly marked or painted on each side of the bow of each lifeboat in letters and numbers not less than 1½ inches high. In addition, the number of persons allowed shall be plainly marked or painted on top of at

least 2 thwarts in letters and numbers not less than 3 inches high.

(d) All oars shall be conspicuously marked with the vessel's name.

(e) Where mechanical disengaging apparatus is used, the control effecting the release of the lifeboat shall be painted bright red and shall have thereon in raised letters either the words—"DANGER-LEVER DROPS BOAT", or the words—"DANGER—LEVER RELEASES HOOKS".

(f) The top of thwarts, side benches and footings of lifeboats shall be painted or otherwise colored international orange. The area in way of the red mechanical disengaging gear control lever, from the keel to the side bench, shall be painted or otherwise colored white, to provide a contrasting background for the lever. This band of white should be approximately 12 inches wide depending on the internal arrangements of the lifeboat.

§ 97.37–40 Liferafts, lifefloats and buoyant apparatus.

(a) Rigid type liferafts, lifefloats, and buoyant apparatus, together with their oars and paddles, shall be conspicuously marked with the vessel's name. For vessels on an international voyage, the vessel's port of registry also shall be similarly marked on lifefloats and buoyant apparatus.

(b) The number of persons allowed on each rigid type liferaft, lifeboat, and buoyant apparatus shall be conspicuously marked or painted thereon in letters and numbers at least 1½ inches high.

(c) There shall be stenciled in a conspicuous place in the immediate vicinity of each inflatable liferaft the following:

INFLATABLE LIFERAFT NO. ----------
---------- PERSONS CAPACITY

These markings shall not be placed on the inflatable life raft containers.

NOTE: § 160.051–8(a) of Subchapter Q (Specifications) of this chapter requires permanently attached name plates of each inflatable liferaft and carrying case. The name plate contains the following information: The name of manufacturer, approval number, the manufacturer's model number, serial number, and lot number, and the number of persons for which the inflatable life raft is approved. In addition, the carrying case shall be marked "Ocean Service Equipment" or "Limited Service Equipment," as applicable, together with the marine inspector's initials, the date, and the letters "USCG."

§ 97.37–43 Life preservers and ring life buoys.

(a) All life preservers, wood floats, and ring life buoys shall be marked with the vessel's name.

(b) For vessels on an international voyage, the vessel's port of registry shall be added in similar type letters on all ring life buoys.

§ 97.37–45 Fire hose and axes.

(a) All fire hose and axes shall be marked with the vessel's name.

§ 97.37–47 Portable magazine chests.

(a) Portable magazine chests shall be marked in letters at least 3 inches high: "PORTABLE MAGAZINE CHEST—FLAMMABLE—KEEP LIGHTS AND FIRE AWAY."

§ 97.37–90 Vessels contracted for prior to November 19, 1952.

(a) Vessels contracted for prior to November 19, 1952, shall meet the requirements of this paragraph.

(1) The requirements of §§ 97.37–5 through 97.37–47 shall be met with the exception that existing signs and markings containing the same general intent, but not necessarily identical wording or exact letter type, size, or color, may be retained so long as they are in good condition to the satisfaction of the Officer in Charge, Marine Inspection.

Subpart 97.39—Posting Placards of Instructions for Launching and Inflating Inflatable Liferafts

§ 97.39–1 When required.

(a) Every vessel equipped with inflatable liferafts shall have posted in conspicuous places which are regularly accessible to the crew and/or passengers, approved placards containing instructions for launching and inflating inflatable liferafts for the information of persons on board. The number and location of such placards shall be as determined necessary by the Officer in Charge, Marine Inspection.

(b) Under the requirements contained in § 160.051–6(c)(1) of Subpart 160.051 in Subchapter Q (Specifications) of this chapter, the manufacturer of approved inflatable liferafts is required to provide approved placards containing such instructions with each liferaft.

Subpart 97.40—Markings on Vessels

§ 97.40–1 Application.

(a) The provisions of this subpart shall apply to all vessels except as specifically noted.

§ 97.40–5 Markings required by Customs Regulations.

(a) The following markings are required by the Customs Regulations. Details of the application of the requirements as well as details of the required markings will be found in those regulations.

(1) *Name of vessel.* On both bows and the stern (yachts excepted), and on steam vessels the name is also required on both sides of the pilothouse, and on steam paddle wheel vessels on the outer side of each paddle box. Yachts shall have the name on the hull.

(2) *Hailing port.* On the stern.

(3) *Official number.* On the vessel's main beam.

(4) *Net tonnage.* On the vessel's main beam.

§ 97.40–10 Draft marks.

(a) All vessels 50 gross tons and over, under the jurisdiction of the U.S. Coast Guard, shall have the draft of the vessel plainly and legibly marked upon the stem and upon the sternpost or rudderpost or at any place at the stern of the vessel as may be necessary for easy observance. The draft shall be taken from the bottom of the keel at the marks to the surface of the water, the bottom of the mark to indicate the draft in feet.

(b) In cases where the keel does not extend forward or aft to the location of the draft marks, due to raked stem or cut-away skeg, the datum line from which the draft shall be taken shall be obtained by projecting the line of the bottom of keel forward or aft, as the case may be, to the location of the draft marks.

(c) In cases where a vessel may have a skeg or other appendage extending locally below the line of the keel, the draft at the end of the vessel adjacent to such appendage shall be measured to a line tangent to the lowest part of such appendage and parallel to the line of the bottom of the keel.

§ 97.40–15 Load line marks.

(a) Vessels assigned a load line shall have the deck line and the load line marks permanently scribed or embossed as required by Subchapter E (Load Lines) of this chapter.

Subpart 97.43—Placard of Lifesaving Signals and Breeches Buoy Instructions

§ 97.43–1 Application.

(a) The provisions of this subpart shall apply to all vessels on an international voyage, and to all other vessels of 150 gross tons or over certificated for ocean, coastwise or Great Lakes service.

§ 97.43–5 Availability.

(a) On all vessels to which this subpart applies there shall be posted in the pilothouse and readily available to the deck officer of the watch a placard (Form CG–811) containing instructions for the use of breeches buoys and the lifesaving signals as set forth in Regulation 16, Chapter V, of the International Convention for Safety of Life at Sea, 1960. These signals shall be used by vessels or persons in distress when communicating with lifesaving stations and maritime rescue units.

(b) A copy of Form CG–811 shall also be conveniently posted in the engineroom and crews quarters of all vessels to which this subpart applies.

Subpart 97.45—Carrying of Excess Steam

§ 97.45–1 Master and chief engineer responsible.

(a) It shall be the duty of the master and the engineer in charge of the boilers of any vessel to require that a steam pressure is not carried in excess of that allowed by the certificate of inspection, and to require that the safety valves, once set and sealed by the inspector, are in no way tampered with or made inoperative except as provided in § 97.30–20.

Subpart 97.47—Routing Instructions

§ 97.47–1 All persons must comply.

(a) Due to existing mine field dangers, all licensed masters, officers, and certificated seamen on United States vessels shall comply strictly with the routing in-

structions issued by competent naval authority. Failure to comply with such routing instructions shall be deemed misconduct within the meaning of R. S. 4450, as amended (46 U. S. C. 239). Nothing herein shall be construed as relieving the master of the responsibility for the safety of his vessel.

Subpart 97.50—Compliance With Provisions of Certificate of Inspection

§ 97.50–1 Master or person in charge responsible.

(a) It shall be the duty of the master or other person in charge of the vessel to see that all of the provisions of the certificate of inspection are strictly adhered to. Nothing in this subpart shall be construed as limiting the master or other person in charge of the vessel, at his own responsibility, from diverting from the route prescribed in the certificate of inspection or taking such other steps as he deems necessary and prudent to assist vessels in distress or for other similar emergencies.

Subpart 97.53—Exhibition of License

§ 97.53–1 Licensed officers.

(a) All licensed officers on a vessel shall have their licenses conspicuously displayed as required by R.S. 4446, 46 U.S.C. 232.

Subpart 97.55—De-Energizing of Cargo Hold Lighting Circuits When Grain or Other Combustible Bulk Cargo Is Carried

AUTHORITY: The provisions of this Subpart 97.55 interpret or apply R.S. 4488, as amended; 46 U.S.C. 481. Treasury Department Order 167-38, October 26, 1959, 24 F.R. 8857.

§ 97.55–1 Master's responsibility.

(a) Before loading bulk grain, or similar combustible bulk cargo, the master shall have the lighting circuits to cargo compartments in which the bulk cargo is to be loaded de-energized at the distribution panel or panel board. He shall thereafter have periodic inspections made of the panel or panel board as frequently as necessary to ascertain that the affected circuits remain de-energized while this bulk cargo remains within the vessel.

§ 97.55–5 Warning notice posted.

(a) As a precaution against any subsequent unintentional re-energizing of the circuits specified above, an appropriate notice shall be posted at the location where the control is effected warning against re-energizing these circuits. Such notice shall remain posted while this bulk cargo remains within the vessel.

Subpart 97.60—Motion Picture Film and Equipment

§ 97.60–1 Type required.

(a) Only acetate or slow-burning film may be used. Nitrocellulose film is specifically prohibited.

(b) Projectors shall be of an approved type.

(R.S. 4488, as amended; 46 U.S.C. 481. Treasury Department Order 167-38, October 26, 1959, 24 F.R. 8857)

Subpart 97.70—Power-Operated Industrial Trucks

AUTHORITY: The provisions of this Subpart 97.70 interpret or apply R.S. 4417a, as amended, 4472, as amended, 4488, as amended, 4491, as amended; 46 U.S.C. 391a, 170, 481, 489. Treasury Department Orders 120, July 31, 1950, 15 F.R. 6521; 167-38, October 26, 1959, 24 F.R. 8857.

§ 97.70–1 Application.

(a) *Power-operated industrial trucks.* (1) Except as provided in subparagraph (3) of this paragraph, power-operated industrial trucks carried on board a vessel as part of the vessel's equipment for handling materials of any kind shall be in compliance with the applicable provisions of this subpart.

(2) Except as provided in subparagraph (3) of this paragraph, power-operated industrial trucks placed on board vessels for handling materials of any kind shall be in compliance with the applicable provisions of this subpart when such vessels are within the navigable waters of the United States, its territories and possessions but not including the Panama Canal Zone.

(3) When power-operated industrial trucks are used in spaces not containing dangerous or hazardous articles, as set forth in § 97.70–10(f), the installation of the minimum safety features of § 97.70–7(c) shall be carried out at the earliest opportunity but in any case not later than July 1, 1963.

(b) *Vessels.* (1) Vessels shall be in compliance with the applicable provisions of this subpart during those periods of time when power-operated industrial trucks are on board as part of the vessel's equipment or when such trucks are placed on board for handling materials of any kind.

NOTE: The regulations affecting the use of power-operated industrial trucks on foreign vessels are in Part 146 of Subchapter N (Dangerous Cargoes) or in the case of foreign tank vessels in Subpart 35.70 of Subchapter D (Tank Vessels) of this chapter.

§ 97.70–3 Alternates.

(a) In cases of undue hardship resulting from unavoidable delays in bringing existing power-operated industrial trucks into compliance with the applicable provisions of this subpart, the Commandant may permit the use of alternate equipment, apparatus, or arrangement for such period of time, and to such extent, and upon such conditions as will assure, to the Commandant's satisfaction, a degree of safety consistent with the minimum standards as set forth in this subpart.

(b) The methods and procedures adopted in connection with the modification of existing equipment to meet required laboratory designations will be taken into consideration in granting permission to use alternate arrangements for a limited period of time.

§ 97.70–5 Definitions of terms used in subpart.

(a) Power-operated industrial trucks are considered to be tractors, lift trucks, and other specialized industrial trucks used for material handling on board a vessel.

(b) For the purpose of the regulations in this subpart, the words "flammable" and "inflammable" are interchangeable or synonymous terms.

§ 97.70–7 Approved power-operated industrial trucks.

(a) Where approved power-operated industrial trucks are required by the regulations in this subchapter such approved trucks shall have a specific designation of a recognized testing laboratory. The following laboratories are recognized for the specific type designations listed:

(1) Underwriters' Laboratories, Inc. (Mailing address, P.O. Box 247, Northbrook, Ill., 60062) for trucks having recognized testing laboratory type designations E, EE, EX, G, GS, LP, LPS, D and DS.

(2) Factory Mutual Laboratories, Engineering Division, 1115 Boston-Providence Turnpike, Norwood, Mass., 02062, for trucks having recognized testing laboratory type designations E, EE, EX, G, GS, LP, LPS, D and DS.

(b) Description of recognized testing laboratory type designations are as follows:

(1) The "E" designated units are electrically powered units that have minimum acceptable safeguards against inherent fire hazards.

(2) The "EE" designated units are electrically powered units that have, in addition to all of the requirements for the "E" units, the electric motors and all other electrical equipment completely enclosed. In certain locations the "EE" unit may be used where the use of an "E" unit may not be considered safe.

(3) The "EX" designated units are electrically powered units that differ from the "E" and "EE" units in that the electrical fittings and equipment are so designed, constructed and assembled that the units may be used in certain atmospheres containing flammable vapors or dusts.

(4) The "G" designated units are gasoline powered units having minimum acceptable safeguards against inherent fire hazards.

(5) The "GS" designated units are gasoline powered units that are provided with additional safeguards to the exhaust, fuel and electrical systems. They may be used in some locations where the use of a "G" unit may not be considered safe.

(6) The "LP" designated units are similar to the "G" units except that they are liquefied petroleum gas engine powered instead of gasoline powered.

(7) The "LPS" designated units are units similar to the "GS" units except that liquefied petroleum gas is used for fuel instead of gasoline.

(8) The "D" designated units are units similar to the "G" units except that

they are diesel engine powered instead of gasoline engine powered.

(9) The "DS" designated units are diesel powered units that are provided with additional safeguards to the exhaust, fuel and electrical systems. They may be used in some locations where a "D" unit may not be considered safe.

(c) In addition to the construction and design safety features required in order to obtain a recognized laboratory type designation, approved power-operated industrial trucks shall have at least the following minimum safety features where applicable:

(1) Power-operated industrial trucks shall be equipped with a warning horn, whistle, or gong, or other device that can be heard clearly above the normal shipboard noises.

(2) Wherever power-operated industrial truck operation exposes the operator to danger from falling objects, the truck shall be equipped with a driver's overhead guard. Where overall height of the truck with forks in the lowered position is limited by head room conditions the overhead guard may be omitted.

NOTE: This overhead guard is only intended to offer protection from the impact of small packages, boxes, bagged material, etc., representative of the job application. It is impractical to build a guard of sufficient strength to withstand the impact of a capacity load since such a guard would constitute a safety hazard because its structure would be so large that it might interfere with good visibility and would weigh so much that it might make the truck top-heavy and unstable.

(3) Power-operated fork lift trucks which handle small objects or unstable loads shall be equipped with a vertical load back rest or rack which shall have height, width and strength sufficient to prevent the load, or part of it, from falling toward the mast when the mast is in a position of maximum backward tilt.

(4) The forks on power-operated fork lift trucks shall be secured to the carriage so that unintentional lifting of the toe shall not occur on such application where this lifting may create a hazard. The factor of safety of forks shall be at least 3 to 1, based on the elastic limit of the material.

(5) Fork extensions or other attachments shall be suitably secured to prevent unintentional lifting or displacement on primary forks.

(6) All exposed wheels shall be provided with guards to prevent the wheels from throwing particles at the operator.

(7) Unless the steering mechanism is of a type that prevents road reactions from causing the steering handwheel to spin, the steering knob, if used, shall be of a mushroom type to engage the palm of the operator's hand, or shall be arranged in some other manner to prevent injury. The knob shall be mounted within the perimeter of the wheel.

(8) All steering controls shall be confined within the clearances of the truck, or so guarded that movement of the controls shall not result in injury to the operator when passing obstructions, stanchions, etc.

§ 97.70–10 Use of power-operated industrial trucks in various locations.

(a) *Spaces containing explosives.* (1) Except as otherwise provided in this paragraph, power-operated industrial trucks shall not be used in a space in which Class A, Class B, or Class C explosives are stowed.

NOTE: Class A, Class B and Class C explosives are defined in Part 146 of Subchapter N (Dangerous Cargoes) of this chapter.

(2) The Commandant may grant authority for the use of approved power-operated industrial trucks with a recognized testing laboratory designation of EX in spaces in which Class A, Class B or Class C explosives are stowed when it can be shown that such trucks can be used with safety.

(3) In a space in which packaged small arms ammunition without explosive bullets is stowed, only approved power-operated industrial trucks with a recognized testing laboratory designation of EX, EE, LPS, GS and DS may be used for handling cargo including the handling of such packaged small arms ammunition.

(b) *Spaces containing flammable liquids.* (1) In a space in which packaged flammable liquids are stowed, only approved power-operated industrial trucks with a recognized testing laboratory designation of EX, EE, GS, LPS, and DS may be used for handling cargo including the handling of such packaged flammable liquids.

(c) *Spaces containing flammable solids or oxidizing materials.* (1) In a space in which packaged flammable solids or oxidizing materials are stowed, only approved power-operated industrial trucks with a recognized testing laboratory designation of EX, EE, GS, LPS, and DS may be used for handling cargo including the handling of such packaged flammable solids or oxidizing materials.

(2) When flammable solids or oxidizing materials are contained in closed cargo vans or closed containers and no other dangerous cargo is stowed in the hold or compartment, any standard commercial type power-operated industrial truck in safe operating condition and having the minimum safety features of § 97.70–7(c) may be used in the spaces.

(3) When oxidizing materials in bulk are stowed in the holds or compartment, any approved commercial type power-operated industrial truck may be used in the spaces.

(d) *Spaces containing hazardous articles.* (1) In a space in which packaged or baled hazardous articles of a fibrous nature or bulk sulfur are stowed, only approved power-operated industrial trucks with a recognized testing laboratory designation of EX, EE, GS, LPS and DS may be used for handling cargo, including the handling of such packaged or baled hazardous articles of a fibrous nature or bulk sulfur.

(2) When hazardous articles of a fibrous nature are contained in closed cargo vans or closed portable containers and no other dangerous cargo is stowed in the hold or compartment, any standard commercial type power-operated industrial truck in safe operating condition and having the minimum safety features of § 97.70–7(c) may be used in the spaces.

(e) *Spaces containing other dangerous cargoes and hazardous articles.* (1) In a space in which dangerous cargoes or hazardous articles subject to the regulations in Part 146 of this chapter except those provided for in paragraphs (a), (b), (c) and (d) of this section, any approved power-operated industrial truck may be used to handle cargo including the handling of such dangerous cargoes or hazardous articles.

(f) *Other spaces.* (1) Any standard commercial type power operated industrial truck in safe operating condition and having the minimum safety features of § 97.70–7(c) may be used in spaces and for handling cargo in spaces not otherwise restricted by regulation in this subpart.

§ 97.70–15 Special operating conditions.

(a) Notification shall be given to the master or senior deck officer on board before placing power-operated industrial trucks in use aboard the vessel.

(b) When power-operated industrial trucks are in use on board vessels subject to the regulations in this subchapter, they shall be in a safe operating condition.

(c) Spaces exposed to carbon monoxide or other hazardous vapors from the exhausts of power-operated industrial trucks shall have adequate ventilation. The concentration of carbon monoxide shall be kept below 100 parts per million in the holds and intermediate decks where persons are working. When necessary, portable blowers of adequate size and location shall be utilized.

(d) The parts and/or equipment of any power-operated industrial truck requiring replacement shall be replaced only by parts and/or equipment equivalent in safety when installed with those used in the original design.

(e) Any truck that emits sparks or flames from the exhaust system shall immediately be removed from service, and not again returned to service until the cause for the emission of such sparks or flames has been eliminated.

(f) When the temperature of any part of the truck is found to be in excess of a safe operating temperature, the truck shall be removed from service until such overheating has been corrected.

(g) Operation of trucks shall be halted immediately and the engines or motors secured, whenever an emergency condition arises aboard the vessel.

(h) Operation of trucks shall be halted immediately and the engines or motors secured in the event of breakage or leakage of containers used for the carriage of flammable liquids, flammable solids or oxidizing materials.

(i) The rated capacity of a truck shall at all times be posted on the truck in a conspicuous place and such capacity shall not be exceeded.

(j) At least one approved 2-pound dry chemical hand portable fire extinguisher, or its approved equivalent, shall be affixed to the truck in a readily accessible

position or kept in close proximity available for immediate use.

(k) Vessel's fire-fighting equipment, both fixed (where installed) and portable, in vicinity of space being worked shall be kept ready for immediate use.

§ 97.70–20 Refueling.

(a) *When permitted.* Power-operated industrial trucks are not permitted to be refueled in the hold of a vessel or on the weather deck except under the following conditions:

(1) Trucks using gasoline as fuel may be refueled in the hold or on the weather deck of a vessel only when such refueling is done with an acceptable portable nonspilling fuel handling system of not over 5 gallons capacity. Transfer of gasoline to these portable nonspilling fuel handling devices is not permitted on board the vessel.

(2) Power-operated industrial trucks using liquefied petroleum gas as fuel may be refueled in the hold or on the weather deck of a vessel only when fitted with removable tanks and provided the hand-operated shut-off valve of the depleted tank is closed and the engine is run until it stalls from lack of fuel before the quick disconnect fitting is opened. In addition, the quick disconnect fitting shall be attached to the fuel tank before the hand-operated shutoff valve is reopened.

(3) Power-operated industrial trucks using diesel oil as fuel may be refueled on the weather deck or in the hold of a vessel by means of portable containers of not over 5-gallon capacity. These trucks may also be refueled on the weather deck of a vessel or portable containers refilled from a larger container provided a suitable pump is used for the transfer operation and a drip pan of adequate size is supplied.

(b) *General requirements.* The following conditions must be met when refueling power-operated industrial trucks in the hold of a vessel or on the weather deck under the circumstances listed in paragraph (a) of this section:

(1) Refueling shall be under the direct supervision of an experienced and responsible person specifically designated for such job by the person in charge of the loading or unloading of the vessel.

(2) No refueling shall be undertaken with less than 2 persons specifically assigned and present for the complete operation, at least one of whom shall be experienced in using the portable fire extinguishers required in the fueling area.

(3) At least one approved 4-pound dry chemical hand portable fire extinguisher, or its approved equivalent shall be provided at the scene of the fueling area. This is in addition to portable extinguisher affixed to the truck in accordance with § 97.70–15(j).

(4) The location for refueling trucks shall be designated by the master or senior deck officer on board the vessel. "No Smoking" signs shall be posted in the area and smoking shall be prohibited.

(5) The location designated for refueling shall be adequately ventilated so as to insure against accumulation of a hazardous concentration of vapors. The ventilation requirements of § 97.70–15(c) when trucks are operating shall also apply when trucks are being refueled.

(6) Truck engines of all trucks in the same hold shall be stopped before any truck in that hold is refueled and before any fuel handling devices or unmounted liquefied petroleum gas cylinders are placed in the hold.

(7) All fuel handling devices and unmounted liquefied petroleum gas containers shall be removed from the hold before any truck engine is started and the trucks again placed in operation.

§ 97.70–25 Charging or replacing batteries.

(a) Batteries for electrically-powered industrial trucks and for the ignition systems of internal combustion engine-powered industrial trucks may be changed in the hold of a vessel provided the following conditions are met:

(1) Suitable handling equipment shall be employed.

(2) Adequate precautions shall be taken to avoid damage to the battery, short circuiting of the battery, and spillage of the electrolyte.

(b) Batteries of electrically-powered industrial trucks may be recharged in a hold of a vessel provided the following conditions are met:

(1) The batteries shall be housed in a suitable, ventilated, portable metal container with a suitable outlet at the top for connection of a portable air hose, or shall be placed directly beneath a suitable metal hood with a suitable outlet at the top for connection of a portable air hose. The air hose shall be permanently connected to an exhaust duct leading to the open deck and terminate in a gooseneck or other suitable weather head. If natural ventilation is not practicable or adequate, mechanical means of exhaust shall be employed in conjunction with the duct. The air outlet on the battery container shall be equipped with an interlock switch so arranged that the charging of the battery cannot take place unless the air hose is properly connected to the box.

(2) If mechanical ventilation is used, an additional interlock shall be provided between the fan and the charging circuit so that the fan must be in operation in order to complete the charging circuit for operation. It is preferable that this interlock switch be of a centrifugal type driven by the fan shaft.

(3) The hold shall not contain any cargo coming under the regulations in Part 146 of Subchapter N (Dangerous Cargoes) of this chapter.

(4) The charging facilities may be part of the truck equipment or may be separate from the truck and located inside or outside the cargo hold. The supply or charging circuit (whichever method is used) shall be connected to the truck by a portable plug connection of the break-away type. This portable plug shall be so engaged with the truck battery charging outlet that any movement of the truck away from the charging station will break the connection between the plug and receptacle without exposing any live parts to contact with a conducting surface or object, and without the plug falling to the deck where it may become subject to injury.

(c) All unmounted batteries shall be suitably protected or removed from an area in the hold of the vessel before trucks are operated in that area.

§ 97.70–30 Stowage of power-operated industrial trucks aboard a vessel.

(a) Power-operated industrial trucks may be stowed in any location aboard a vessel provided the following conditions are met:

(1) Gasoline powered trucks shall have all the fuel expended from the system.

(2) Liquefied petroleum gas powered trucks shall have the fuel tanks removed and all the fuel expended from the system.

(b) Power-operated industrial trucks not meeting the conditions set forth in paragraph (a) of this section shall be stowed on the open deck except for intervals such as lunch hours, between work shifts, interdock and intraport movements. If stowed in a fixed metal enclosure located on or above the weather deck, such enclosure shall have access from the weather deck only and shall have adequate ventilation, so arranged as to remove vapors from both the upper and lower portions of the space.

§ 97.70–35 Stowage of fuel handling devices aboard a vessel.

(a) Flammable liquids and gases to be used as fuels for power-operated industrial trucks shall be marked, labeled and stowed as follows:

(1) They shall be stowed in ICC specification containers, A.S.M.E. containers or portable safety containers having the approval of a recognized testing laboratory, which containers are authorized for the contents.

(2) Containers shall be marked with the name of the contents and shall be labeled in accordance with ICC requirements as follows:

(i) Flammable liquids—"Red Label"; or,

(ii) Flammable gases—"Red Gas Label".

(3) Containers shall be stowed on or above the weather deck in locations designated by the master. ICC specification containers, A.S.M.E. containers, or portable safety containers having the approval of a recognized testing laboratory may be stowed below the weather deck in a paint or lamp locker provided such containers do not exceed 5 gallons capacity each.

(b) Diesel fuel shall be stowed in locations designated by the master.

Subpart 97.75—Prevention of Oil Pollution

§ 97.75–1 Prohibited zones.

(a) All cargo vessels shall be so operated as to meet the requirements of the Oil Pollution Act, 1924 (33 U.S.C. 431–437). In addition, all cargo ships shall be so operated as to avoid discharging

any oil or oily ballast which may foul the surface of the sea, within any of the prohibited zones set forth in the Oil Pollution Act, 1961 (33 U.S.C. 1001–1015).

(Sec. 8, 75 Stat. 403; 33 U.S.C. 1007. Treasury Department Order 167-46, November 6, 1961, 26 F.R. 10609)

PART 98—SPECIAL CONSTRUCTION, ARRANGEMENT, AND PROVISIONS FOR CERTAIN DANGEROUS CARGOES IN BULK

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98.35–50 Periodic tests and inspections.

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Subpart 98.01—Application

§ 98.01–1 General.

(a) The provisions of this part shall apply to all vessels which carry in bulk any of the dangerous cargoes specifically noted in this part.

(b) The provisions of Subpart 98.35 shall apply to portable tanks for the transportation of combustible liquids on board cargo vessels described in § 90.05–1 in this subchapter. Certain provisions in Subpart 98.35 apply to United States flag vessels and to foreign vessels when such vessels have on board combustible liquid cargo in portable tanks other than in drums, barrels, or other packages.

§ 98.01–5 Effective date.

(a) The provisions in this part which require inspection and certification of vessels shall be in effect on and after January 1, 1959, for new construction and on and after January 1, 1960, for existing vessels. Vessels in existence on January 1, 1959, and vessels contracted for prior to January 1, 1959, which may carry in bulk any of the dangerous cargoes specifically noted in this part shall meet the applicable requirements of this subchapter or Subchapter D (Tank Vessels) of this chapter, as is reasonable and practicable in the opinion of the Officer in Charge, Marine Inspection, to qualify for certification. In this respect the Officer in Charge, Marine Inspection, may grant departures from specific requirements of this chapter if in his opinion the circumstances warrant such departures. In any case the Officer in Charge, Marine Inspection, shall satisfy himself that the vessel and its equipment are in good condition and satisfactory for the purposes intended.

(b) The other provisions of this part shall be in effect on and after July 1, 1958.

(c) The provisions of Subpart 98.35 regarding portable tanks for combustible liquids shall be in effect on and after March 1, 1963.

Subpart 98.03—Barges Carrying Dangerous Cargoes

§ 98.03–1 Application.

(a) All barges carrying in bulk any of the dangerous cargoes specifically noted in this part shall be subject to the applicable provisions of this subpart.

(b) Barges which are built or converted to conform to the requirements of §§ 98.03–7, 98.03–8, 98.03–15, 98.03–20, 98.03–25 and 98.03–30 will be exempt from compliance with the requirements of § 98.03–10.

§ 98.03–5 Effective dates for certain requirements.

(a) The special operating requirements in § 98.03–10 for all open hopper type barges while carrying in bulk any of the dangerous cargoes specifically noted in this part shall be in effect on and after March 1, 1963.

(b) All barges, the construction or conversion of which is started on or after July 1, 1964, shall conform to the requirements of §§ 98.03–7, 98.03–8, 98.03–15, 98.03–20, 98.03–25, and 98.03–30.

§ 98.03–7 Barge hull classifications.

(a) Each barge constructed or converted in conformance with this subpart shall be assigned a hull type number. The Commandant will designate the barge hull types to be used for carrying cargoes in order to insure that the vessel is designed consistent with the degree and nature of the hazard of the commodity carried.

(b) For this purpose the barge hull types shall be defined as follows:

(1) *Type I barge hull.* Barge hulls classed as Type I are those designed to carry products which require the maximum preventive measures to preclude the uncontrolled release of the cargo to the waterways and/or atmosphere.

(2) *Type II barge hull.* Barge hulls classed as Type II are those designed to carry products which require substantial preventive measures to preclude uncontrolled release to the atmosphere, but whose uncontrolled release to the waterways does not constitute a longlasting public or operating personnel hazard, though local and temporary pollution may occur.

(3) *Type III barge hull.* Barge hulls classed as Type III are those designed to carry products of sufficient hazard to require a moderate degree of control.

§ 98.03–8 Alternative arrangements.

(a) Alternative arrangements, differing from those specifically required by this subpart, may be considered and approved by the Commandant, if it is demonstrated to his satisfaction that a degree of safety is obtained which is consistent with the intent of this subpart.

§ 98.03–10 Special operating requirements for open hopper type barges while carrying dangerous cargoes in bulk.

(a) All open hopper type barges, while carrying in bulk any of the dangerous cargoes specifically noted in this part, shall be operated in conformance with the provisions in this section. However, the provisions in this section are not applicable to such barges when empty (not necessarily cleaned or gas-freed).

(b) (1) Except as otherwise provided in this section, no such open hopper type barge shall be placed as lead barge in any tow. Such barges shall be placed in protected positions within the tow so that the danger from diving or swamping will be minimized. Where, due to operating conditions, compliance with this subparagraph is impossible, the provisions of subparagraph (3) of this paragraph apply. The person in charge of the towing vessel shall be responsible for compliance with this subparagraph.

(2) No such open hopper type barge shall be moved from a loading facility unless all void spaces and bilges are substantially free of water. Periodic inspections and necessary pumping shall be carried out to insure the maintenance of such water-free conditions, in order to minimize the free surface effect in both the longitudinal and transverse directions. Except when otherwise considered necessary for inspection or pumping, all hatch covers and other hull closure devices for void spaces and hull compartments shall be closed and secured at all times. In the case of unmanned barges, the person in charge of the towing vessel shall be deemed to be in charge of the barge, and all requirements to be carried out on the barge shall be carried out by or under the direction of such person.

(3) When an open hopper type barge is in an exposed position, such that protection from swamping provided by adjoining barges cannot be obtained from location within the tow alone, it shall be the responsibility of the person in charge of the towing vessel to control speed so as to insure protection against diving and swamping of the barge, having regard to its design and freeboard, and other operating conditions.

(c) To show that special operating requirements apply to a specific open hopper type barge, additional placards or signs shall be displayed in at least four different locations on the barge when the cargoes subject to this part are carried in any form in the cargo tanks. The placards or signs shall be posted on the barge approximately amidships on each side and near the centerline of each end, facing outboard. Racks, or other suitable means, for mounting such placards or signs shall be so arranged as to provide clear visibility and shall be protected from becoming readily damaged or obscured. The placards or signs shall be at least equal in dimensions to the ICC standard tank car "Dangerous" placard (10¾ inches square or larger), and shall display a circle (10 inches in diameter or larger) with alternating quadrants of white and red, and so mounted that the red quadrants are centered on the vertical axis. The shipper and/or owner of the barge shall be responsible for the installation of the required placards or signs, including maintenance of them while such barge is in temporary storage with cargo aboard. The person in charge of the towing vessel shall be responsible for the continued maintenance of the placards or signs while such barge is in transit.

§ 98.03–15 Rakes and coamings.

(a) Each barge hull shall be constructed with a suitable bow form (length, shape and height of headlog) to protect against diving at the maximum speed at which the barge is designed to be towed. In any integrated tow, only the lead barge need comply with this requirement. In any case, the operator of the towing vessel shall be guided by appropriate speed limitations.

(b) All open hopper type barges shall be provided with coamings around the hopper space and a 36-inch minimum height plowshare breakwater on the forward rake. Coamings shall have a minimum height of 36 inches forward graduated to a minimum height of 24 inches at midlength and 18 inches thereafter.

§ 98.03–20 Subdivision and stability.

(a) *General.* In addition to complying with the requirements of Part 93 of this subchapter as applicable, Types I and II barge hulls shall comply with the provisions of this section.

(b) *Types I and II barge hulls.* (1) Types I and II barge hulls shall be constructed with a complete watertight deck, or if of "open hopper type", with such construction that positive buoyancy and stability will be maintained when the barge is fully loaded and the hopper space is flooded to the level of the main deck. Credit may be given for the buoyancy, if any, of the immersed portion of the full cargo tanks when an effective arrangement for securing the tanks is provided.

(2) (i) Type I barge hulls shall retain positive buoyancy and stability after holing the bottom or side shell plating anywhere on its girth including the intersection of a transverse and a longitudinal watertight bulkhead.

(ii) Type I box barge hulls, specifically designed for operation in an integrated tow, shall retain positive buoyancy and stability after holing the bottom shell plating anywhere on its girth, except in way of a transverse watertight bulkhead, or after holing the side shell plating in way of a transverse watertight bulkhead.

(3) Type II barge hulls shall retain positive buoyancy and stability after holing the bottom or side shell plating anywhere on its girth except in way of a transverse watertight bulkhead.

§ 98.03–25 Hull structure.

(a) *General.* In addition to complying with the structural requirements of Part 92 of this subchapter as applicable, Types I and II barge hulls shall comply with the provisions of this section.

(b) *Types I and II barge hulls.* Under an assumed grounding condition such that the forward rake bulkhead rests upon a pinnacle at the water surface, the maximum hull bending stress shall not exceed the following limits:

(1) Independent tanks may be installed in such a manner so that they do not contribute to the strength and stiffness of the barge. In such case, the hull stress shall not exceed either 50 percent of the minimum ultimate tensile strength of the material or 70 percent of the yield strength when specified, whichever is greater.

(2) The Commandant may consider a reduction in hull stress when independent tanks are installed in such a manner as to contribute to the strength and stiffness of the barge and this is accounted for in determining the effective section modulus of the barge. In such case, the hull stress shall not exceed the percentage stress values prescribed in subparagraph (1) of this paragraph, multiplied by the quantity $\left(1.5-\frac{\text{SWT}}{\text{UTS}}\right)$, where SWT is the stress calculated without including the effect of the tanks, and UTS is the minimum ultimate tensile strength of the material. The value SWT, however, shall in no case be more than 75 percent of UTS.

§ 98.03–30 Cargo tanks and supports.

(a) *General.* Saddles and hold-down securing straps for independent cargo tanks shall be designed to prevent tank failure due to loads induced in the saddles or straps by barge deflection.

(b) *Collision protection.* (1) All independent cargo tanks installed on Type I and Type II barge hulls shall be protected with suitable collision chocks or

collision straps to withstand a longitudinal collision load of one and one-half times the weight of the tank and cargo. All other independent cargo tanks shall be provided with suitable collision chocks or collision straps to withstand a longitudinal collision load equal to the weight of the tank and cargo.

(2) All cargo tanks shall be so located as to reduce the likelihood of their being damaged in the event of collision. This protection shall be obtained by locating the cargo tanks not less than 4 feet from the side-shell and box-end for Type I barge hulls and 3 feet for Type II barge hulls, and not less than 25 feet from the headlog at the bow for both types.

(c) *Cargo tank design*—(1) *Types I and II barge hulls.* (i) In addition to requirements provided for in applicable regulations for a specific commodity, cargoes subject to the provisions of this subpart shall be transported in cargo tanks meeting the requirements of this paragraph. Pressure vessel type cargo tanks shall have sufficient additional strength so as to limit the maximum combined tank stress, including saddle horn and bending stresses, to 1.5 times the maximum allowable hoop stress in still water, and to the yield strength of the tank material or 70 percent of the minimum ultimate tensile strength of the tank material, if less, in the grounded condition as required by § 98.03–25(b).

(ii) Gravity type cargo tanks shall have sufficient additional strength to limit the maximum combined tank stress, including saddle horn and bending stresses, to the yield strength of the tank material or 70 percent of the minimum ultimate tensile strength of the tank material, if less, in the grounded condition as required by § 98.03–25(b).

(2) *Type III barge hulls.* In addition to the requirements of this paragraph, pressure-vessel-type cargo tanks shall have sufficient additional strength so as to limit the maximum combined stress, including saddle horn and bending stress, to 1.5 times the maximum allowable hoop stress.

§ 98.03–35 Special operating requirements for barges carrying certain dangerous cargoes in bulk.

(a) The requirements of this section shall apply to all barges carrying in bulk any of the dangerous cargoes specifically noted in this part.

(b) All barges constructed or modified in conformance with the requirements of this subpart are exempt from the provisions of § 98.03–10.

(c) When it is necessary to operate box or square-end barges as lead barges of tows, the person in charge of the towing vessel shall control the speed to insure protection against diving and swamping of such barges, having due regard to their design and freeboard, and to the operating conditions.

(d) All barges, while carrying in bulk any of the dangerous cargoes specifically noted in this part, shall be operated in conformance with the provisions of this section. However, the provisions of this section are not applicable to such barges when empty and gas-freed.

(e) Barges shall not be moved from a loading facility unless all bilges and void spaces (except those used for ballasting) are substantially free of water. Periodic inspections and necessary pumping shall be carried out to insure maintenance of such water-free condition in order to minimize the free surface effects, both in longitudinal and transverse directions. Except when otherwise considered necessary for inspection or pumping, all hatch covers and other hull closure devices for void spaces and hull compartments other than cargo spaces shall be closed and secured at all times.

(f)(1) Warning signs shall be displayed on the vessel, port and starboard, facing outboard without obstructions, at all times except when the vessel is gas free. The warning sign shall be rectangular and a minimum of three feet wide and two feet high. It shall be of sufficient size to accommodate the required alerting information, which shall be shown in black block style letters and numerals (characters) at least three inches high on a white background. The minimum spacing between adjacent words and lines of characters shall be two inches. The minimum spacing between adjacent characters shall be one-half inch. All characters shall have a minimum stroke width of one-half inch and shall be a minimum of two inches wide, except for the letters "M" and "W" which shall be a minimum of three inches wide, and except for the letter "I" and the numeral "1" which may be one-half inch wide. The signs shall have a two-inch minimum white border clear of characters. The signs shall be maintained legible. The alerting information shall include the following:

(i) Danger.

(ii) Categories of hazards: (This shall be as listed in the classification column in § 146.04–5, in Subchapter N (Dangerous Cargoes) of this chapter, and additional descriptive terms, as applicable).

(iii) Cargo identification by name: (This name shall be as listed in § 146.04–5 in Subchapter N (Dangerous Cargoes) of this chapter. If not specifically listed by name, the common chemical name as shown on the information card shall be used.)

(iv) Prohibitions: (Necessary prohibitions, such as "No Smoking," etc.).

(2) An information card for each cargo being transported shall be carried on the bridge or in the pilot house of the towing vessel readily available for use by the person in charge of the watch. Such information card shall also be carried aboard the barge when it is not gas free. The minimum card size shall be 7" by 9½". The card shall have legible printing on one side only. The following data shall be listed:

(i) *Cargo identification and characteristics.* Identification of the cargo as listed in § 146.04–5 in Subchapter N (Dangerous Cargoes) of this chapter and its common chemical name if the chemical name is not so specifically listed, its appearance and odor. A statement of the hazards involved and instructions for the safe handling of the cargo and, as applicable, the need for special cargo environments.

(ii) *Emergency procedures.* Precautions to be observed in the event of spills, leaks, or equipment or machinery breakdown and/or uncontrolled release of the cargo into the waterway or atmosphere. Precautions to be observed in the event of exposure of personnel to toxic cargoes.

(iii) *Firefighting procedures.* Precautions to be observed in the event of a fire occurring on or in the vicinity of the barge, and an enumeration of firefighting media suitable for use in case of a cargo fire.

(3) In the event that a barge is or has been loaded with two or more dangerous cargoes and until the tanks containing such cargoes have been gas freed, the following additional requirements shall be met:

(i) A warning sign, meeting the requirements of subparagraph (1) of this paragraph and setting forth the alerting information required by subparagraph (1) (i) and (iv) of this paragraph, shall be located amidships.

(ii) The warning signs for each cargo meeting the requirements of subparagraph (1) of this paragraph and setting forth the alerting information required by subparagraph (1) (ii) and (iii) of this paragraph shall be so located that each sign positively identifies the contents of each tank.

(iii) An information card for each cargo (see subparagraph (2) of this paragraph) shall be carried for ready reference aboard the barge.

(g) During the time the cargo tanks contain dangerous cargoes subject to the provisions of this subpart in any amount, in the liquid or gaseous state, the barge shall be under constant surveillance.

(1) A strict watch of each unmanned barge in tow shall be maintained from the towing vessel while underway.

(2) A towing vessel engaged in transporting such unmanned barges shall not leave them unattended. When a barge is moored, but not gas free, it shall be under the observation of a watchman who may be a member of the complement of the towing vessel, or a terminal employee, or other person. Such a person shall be responsible for the security of the barge and for keeping unauthorized persons off the barge. Such person shall be provided with, read, and have in his possession for ready reference the information cards required by paragraph (f)(2) of this section.

§ 98.03–40 Manning of barges carrying dangerous cargoes in bulk.

(a) Except as provided for in this section, barges need not be manned unless in the judgment of the Officer in Charge, Marine Inspection, such manning is necessary for the protection of life and property and for the safe operation of the vessel: *Provided, however,* That towing vessels, while towing barges which are not required to be manned, shall be provided with and have on board the information card required by § 98.03–35,

which card shall be in the possession of the master or person in charge.

(b) At least one member of the crew of barges required to be manned pursuant to paragraph (a) of this section shall be especially qualified in the handling of the specific cargo to be carried. The Officer in Charge, Marine Inspection, shall be furnished satisfactory documentary evidence that such person is trained in, and capable of performing competently, the necessary operations which relate to the carriage and transfer of such cargo.

§ 98.03–45 Cargo handling.

(a) A sufficient number of persons shall be on duty to perform cargo transfer operations. A person especially qualified in the handling of the specific cargo to be transferred shall be on duty to perform or supervise cargo transfer operations, which person shall be considered to be in charge of such operations. The Officer in Charge, Marine Inspection, shall be furnished satisfactory documentary evidence that such person is trained in, and capable of performing competently, the necessary operations which relate to the transfer of such cargo.

(b) The shipper and the owner, charterer, agent, master, or person in charge of any barge carrying dangerous cargoes subject to the provisions of this subpart, shall insure that the requirements of this section and § 98.03–40 are complied with.

Subpart 98.05—Elemental Phosphorus in Water in Bulk

§ 98.05–1 General.

(a) Elemental phosphorus, white or yellow, in water may be carried in bulk only in cargo barges, tank barges, or cargo vessels in accordance with the provisions of this subpart.

(b) Any vessel carrying elemental phosphorus in water in bulk shall be inspected and certificated in accordance with the provisions of this subchapter or Subchapter D (Tank Vessels) of this chapter, as applicable.

§ 98.05–5 Types of cargo tanks.

(a) Tanks in which the vessel's structure forms a part thereof may be employed, provided void spaces are located surrounding the tanks on the sides and bottom.

(b) Tanks independent of the hull either cylindrical or of rectangular design may be employed. The plating of such tanks shall be not less than 5/16 inch thick.

(c) The tanks shall be designed and tested to a head of 8 feet above the tank top or the highest level the lading may rise, whichever is the greater.

(d) When a water displacement method of discharge is used, pressure-vessel type cargo tanks, designed and tested in accordance with Subchapter F (Marine Engineering) of this chapter shall be employed. Such tanks shall be designed for the maximum pressure to which they may be subjected when water pressure is used to discharge the cargo.

§ 98.05–10 Venting.

(a) Each cargo tank shall be fitted with an approved pressure-vacuum relief valve set to discharge at a pressure not exceeding 2 pounds per square inch. The discharge therefrom shall lead overboard above the waterline. When pressure vessel type tanks are used, each tank shall be fitted with a relief valve of suitable size.

§ 98.05–15 Installation.

(a) Adequate clearance shall be provided for the inspection and maintenance of independent cargo tanks, or such tanks shall be made movable.

§ 98.05–20 Openings in tanks.

(a) Openings in tanks are prohibited below deck except for access openings used for inspection and maintenance of tanks. Manholes or access trunks shall be of not less than 20 inches diameter. Openings shall be fitted with bolted cover plates and gaskets resistant to the attack of phosphorus pentoxide.

§ 98.05–25 Outage.

(a) Sufficient outage shall be provided to prevent the tanks from being liquid full at any time, but in no case shall the outage be less than 1 percent. When pressure vessel type tanks are used outage need not be provided.

§ 98.05–30 Cargo discharging.

(a) Pumps shall be employed in the discharge of cargo except when pressure vessel type tanks are used, water displacement method may be employed. The use of compressed air to discharge cargo is prohibited.

§ 98.05–35 Cargo temperature.

(a) Cargo shall be loaded at a temperature not exceeding 140° F., and then cooled until the water above the cargo has a temperature not exceeding 105° F. prior to the movement of the vessel. Upon presentation of satisfactory proof that procedures followed will provide adequate safety in transportation and handling, the Commandant may authorize movement of the vessel following cooling of the water above the cargo to a temperature not exceeding 115° F.

§ 98.05–40 Heating coils.

(a) Coils in which steam or hot water is circulated to heat the cargo so that it may be pumped shall be located outside the cargo tanks.

§ 98.05–45 Void flooding.

(a) A fixed ballast piping system (including a power driven pump of ample capacity), or other means acceptable to the Commandant shall be installed so that any void space surrounding the fixed tanks may be flooded.

§ 98.05–50 General requirements.

(a) All enclosed compartments containing independent cargo tanks and machinery spaces containing cargo pumps for handling liquid phosphorus shall be provided with effective means of ventilation.

(b) Cargo piping shall be of steel or wrought iron. Flanges and pipe fittings shall be of steel or malleable iron. Valves shall be of steel or bronze.

(c) Cargo lines shall be traced with steam piping and secured thereto by lagging to prevent solidification of cargo during transfer operations.

(d) A water hose shall be connected ready for immediate use and any spillage of phosphorus shall be immediately washed down.

(e) At least two fresh air masks or self-contained oxygen breathing apparatus shall be stowed on board the vessel at all times for use of personnel entering the tanks or adjacent spaces.

(f) Authorization from the Commandant (MMT) shall be obtained to transport lading other than phosphorus in the cargo tanks or to have on board any other cargo when phosphorus is laden in the tanks.

(g) Mechanical ventilation of sufficient capacity to insure a change of air every three minutes shall be provided during the inspection and maintenance of the cargo tanks.

(h) During the time elemental phosphorus is laden in the tanks, the barge shall be under constant surveillance. A towing vessel engaged in transporting such barges shall not leave the barge unattended except when the barge is moored at a pier, wharf, dock or other terminal and then only if such facility is provided with watchman or guard service.

(i) The Interstate Commerce Commission standard "Dangerous" placard shall be displayed in four locations on the barge when elemental phosphorus is laden in the tanks. A placard shall be posted approximately amid ships on each side facing outboard, and a placard shall be posted at each end of the barge at about the end of the tanks facing outboard. After unloading and before a tank or tanks are cleaned, the placard shall be reversed to show the "Dangerous—Empty" legend.

(j) While fast to a dock, a vessel during transfer of bulk cargo shall display a red flag by day or a red light by night, which signal shall be so placed that it will be visible on all sides. When at anchor, a vessel during transfer of bulk cargo shall display a red flag by day, which signal shall be so placed that it will be visible on all sides.

§ 98.05–55 Electrical bonding.

(a) Independent cargo tanks shall be electrically grounded to the hull. The barge shall be electrically connected to the shore piping prior to connecting the cargo hose. This electrical connection shall be maintained until after the cargo hose has been disconnected and any spillage has been removed.

§ 98.05–60 Tests and inspections.

(a) Each gravity tank shall be tested before being put into service as prescribed in § 98.05–5(c).

(b) Tanks shall be retested as prescribed in § 98.05–5 eight years after being placed into service and at each four-

year interval thereafter, as well as before being returned to service after extensive repairs.

Subpart 98.10—Sulfuric Acid in Bulk

§ 98.10–1 General.

(a) Sulfuric acid or spent sulfuric acid may be carried in bulk only in cargo barges, tank barges, or cargo vessels in accordance with the provisions of this subpart.

(b) Any vessel carrying sulfuric acid or spent sulfuric acid in bulk shall be inspected and certificated in accordance with the provisions of this subchapter or Subchapter D (Tank Vessels) of this chapter, as applicable.

§ 98.10–5 How acid may be carried.

(a) Sulfuric acid of concentration of 77.5 percent (1.7019 specific gravity) (59.8° Baume) or greater concentrations with or without an inhibitor, provided the corrosive effect on steel measured at 100° F. is not greater than that of 66° Baume commercial sulfuric acid, may be transported in unlined gravity type cargo tanks or unlined pressure-vessel type cargo tanks.

(b) Sulfuric acid of concentration of 65.25 percent (1.559 specific gravity) (52° Baume) or greater concentrations, provided the corrosive effect on steel measured at 100° F. is not greater than that of 52° Baume commercial sulfuric acid, may be transported in unlined pressure-vessel type cargo tanks independent of the vessel's structure.

(c) Sulfuric acid of concentration not to exceed 65.25 percent (1.559 specific gravity) (52° Baume) may be transported in gravity type cargo tanks or pressure-vessel type cargo tanks which are lined with lead or other equally suitable acid-resistant material acceptable to the Commandant.

(d) Sulfuric acid of concentration not to exceed 51 percent (1.408 specific gravity) (42° Baume) and spent sulfuric acid resulting from the use of sulfuric acid in industrial processes may be transported in gravity type cargo tanks which are lined with rubber or other equally suitable acid-resistant material acceptable to the Commandant.

(e) Spent or sludge sulfuric acid resulting from the use of sulfuric acid in industrial processes may be transported in unlined gravity type cargo tanks or unlined pressure vessel type cargo tanks, provided the corrosive effect on steel is not greater than that of commercial sulfuric acid as prescribed in paragraph (a) of this section.

§ 98.10–10 Gravity type cargo tanks.

(a) Gravity type cargo tanks shall be designed and tested to meet the rules of the American Bureau of Shipping for a head of water at least 8 feet above the tank top or the highest level the lading may rise, whichever is the greater. The plate thickness of any part of the tank shall not be less than ⅜ inch. Such tanks may form an integral part of the ship's structure, or may be independent of the ship's structure, or form a part thereof.

(b) Gravity type tanks shall be vented to atmosphere. A vent shall be fitted having a cross-sectional area of not less than that of the filling line unless an ullage opening is provided having a cross-sectional area at least equal to that of the filling line. The minimum size of a cargo tank vent shall be not less than 2½ inches. The outlet end of the vent shall terminate above the weather deck, clear of all obstructions and away from any source of flame. The vent shall terminate in a gooseneck bend and shall be fitted with a single flame screen of at least 30 x 30 mesh; or two screens of at least 20 x 20 mesh, not less than 1 inch nor more than 1½ inches apart. The flame screens shall be corrosion-resistant wire. No shut-off valve or frangible disc shall be fitted in the vent lines.

(c) Compressed air shall not be used to discharge cargo from gravity type cargo tanks.

§ 98.10–15 Pressure-vessel type cargo tanks.

(a) Pressure-vessel type tanks shall be independent of the vessel's structure and shall be designed for the maximum pressure to which they may be subjected when compressed air is used to discharge the cargo, but in no case shall the design pressure be less than 50 pounds per square inch.

(b) Pressure-vessel type cargo tanks shall be designed as Class II or Class III unfired arc-welded cylindrical pressure vessels, inspected and tested as required by Subchapter F (Marine Engineering) of this chapter.

(c) Tanks designed, inspected, and tested as required by Interstate Commerce Commission Specification 103A, 103A–W, 103B, or 103B–W will be accepted as pressure-vessel type cargo tanks, provided the maximum pressure to which the tanks may be subjected does not exceed 30 pounds per square inch, and provided that prior to installing such tanks on a barge or cargo vessel, the owner shall furnish the Commandant with a copy of the inspection report certifying that the tanks and appurtenances comply with Interstate Commerce Commission specifications.

(d) When compressed air is used to discharge the cargo, the tank shall be fitted with a vent led to atmosphere in which shall be installed a rupture disc. The rupture disc shall be designed to burst at a pressure not exceeding the design pressure of the tank. An auxiliary vent to relieve the pressure or vacuum in the tank during filling or discharge of the cargo may be led from the vent line between the tank and the rupture disc. A shut-off valve may be fitted in the auxiliary vent.

(e) Except as otherwise specified in this section, the vents shall conform to the requirements of § 98.10–10 (b).

§ 98.10–20 Installation.

(a) Adequate clearance shall be provided for the inspection and maintenance of independent cargo tanks, or such tanks shall be made movable.

§ 98.10–25 Openings in tanks.

(a) Openings in tanks are prohibited below deck, except for access openings used for inspection and maintenance of tanks, or unless otherwise specifically approved by the Commandant. Openings shall be fitted with bolted cover plates and acid-resistant gaskets.

§ 98.10–30 Cargo piping.

(a) Where special arrangements are approved by the Commandant to permit a pump suction to be led from the bottom of the tank, the filling and discharge lines shall be fitted with shut-off valves located above the weather deck or operable therefrom.

§ 98.10–35 Outage.

(a) Sufficient outage shall be provided to prevent the tanks from being liquid full at any time, but in no case shall the outage be less than 1 percent.

§ 98.10–40 Lining.

(a) The interior surfaces of cargo tanks shall be made smooth, welds chipped or ground smooth, and the surfaces thoroughly cleaned before the lining is applied. All interior surfaces of the tanks shall be maintained free from scale, oxidation, moisture and all foreign matter during the lining process.

(b) The material used for lining or coating the tanks shall be resistive to attack by the sulfuric acid to be carried; homogeneous, nonporous, and imperforate when applied; and not less elastic than the metal of the tank proper. It shall be of substantially uniform thickness, not less than 5/32 inch for lead lining, and not less than 3/16 inch for rubber lining. The lining shall be directly bonded to the tank plating, or attached by other satisfactory means acceptable to the Commandant.

(c) Rubber lining shall be scarfed at the joints to overlap at least 1½ inches, and the faying surfaces shall be beveled to an angle of approximately 45° with vulcanizing being done in place.

(d) Cargo piping, including valves, fittings, and flanges, when subject to the corrosive attack of the acid, shall be lined or coated with corrosion-resistant material. Vent piping, including flanges and fittings, shall be similarly lined or coated at least to the height of the frangible disc, if such is installed.

§ 98.10–45 General requirements.

(a) All enclosed compartments containing sulfuric acid cargo tanks and all machinery spaces containing cargo pumps for handling sulfuric acid shall be fitted with effective means of ventilation.

(b) Cargo pumps, piping, valves, fittings, and flanges used in the handling of sulfuric acid cargo shall be made of material resistive to attack by the sulfuric acid to be carried, or shall be suitably protected against such corrosive attack.

(c) A separator shall be fitted in compressed air lines to the tank when air pressure is used to discharge the cargo.

(d) The use of naked lights and artificial lights, other than electric lights or portable battery lights, is prohibited during the filling and discharge operations. Smoking is prohibited and the master or officer in charge of the vessel shall post "No Smoking" signs during filling and discharging operations. All tools used in the loading or unloading operations shall be of the nonsparking type. Fire or other naked lights shall not be applied to any tank for the purpose of liquefying congealed sulfuric acid. Heating coils will only be permitted as a means of liquefying frozen or congealed sulfuric acid.

(e) A water hose shall be connected ready for immediate use and any leakage or spillage of acid shall be immediately washed down.

(f) Tanks approved for the transportation of sulfuric acid in bulk shall not be used for the transportation of any other commodity, except upon authorization by the Commandant (MMT).

(g) While fast to a dock, a vessel during transfer of bulk cargo shall display a red flag by day or a red light by night, which signal shall be so placed that it will be visible on all sides. When at anchor, a vessel during transfer of bulk cargo shall display a red flag by day, which signal shall be so placed that it will be visible on all sides.

§ 98.10–50 Tests and inspections.

(a) Each gravity type cargo tank shall be tested before being put into service as prescribed in § 98.10–10(a).

(b) Unlined gravity type cargo tanks shall be retested as prescribed in § 98.10–10 (a) eight years after being placed into service and at each four year interval thereafter, as well as before being returned to service after extensive repairs.

(c) Unlined pressure-vessel type cargo tanks shall be subjected to a hydrostatic pressure of one and one-half times the design pressure at any time the marine inspector considers such hydrostatic tests necessary to determine the condition of the tanks.

(d) Each cargo tank shall be subjected to an internal examination at least once in every four years. Where the lining of a cargo tank has deteriorated in service or is not in place, the marine inspector may require such tank to be subjected to the prescribed hydrostatic test if deemed necessary to determine the condition of the tank.

Subpart 98.15—Hydrochloric Acid in Bulk

§ 98.15–1 General.

(a) Hydrochloric acid may be carried in bulk in cargo barges, tank barges, or cargo vessels in accordance with the provisions of this subpart.

(b) Any vessel carrying hydrochloric acid in bulk shall be inspected and certificated in accordance with the provisions of this subchapter or Subchapter D (Tank Vessels) of this chapter as applicable.

§ 98.15–5 How acid may be carried.

(a) Hydrochloric acid shall be carried in gravity or pressure type cargo tanks which are independent of the vessel's structure provided such tanks are lined with rubber or other equally suitable material acceptable to the Commandant.

§ 98.15–10 Gravity type cargo tanks.

(a) Gravity type cargo tanks shall be designed and tested to meet the rules of the American Bureau of Shipping for a head of water at least 8 feet above the tank top or the highest level the lading may rise, whichever is the greater. The plate thickness of any part of the tank shall not be less than ⅜ inch. Such tanks shall be independent of the vessel's structure.

(b) Gravity type tanks shall be vented to atmosphere. A vent shall be fitted having a cross-sectional area of not less than that of the filling line unless an ullage opening is provided having a cross-sectional area at least equal to that of the filling line. The minimum size of a cargo tank vent shall not be less than 2½ inches. The outlet end of the vent shall terminate above the weather deck, clear of all obstructions and away from any source of flame. The vent shall terminate in a gooseneck bend and shall be fitted with a single flame screen of at least 30 x 30 mesh; or two screens of at least 20 x 20 mesh, not less than 1 inch nor more than 1½ inches apart. The flame screens shall be of corrosion-resistant wire. No shut-off valve or frangible disc shall be fitted in the vent lines.

(c) Compressed air shall not be used to discharge cargo from gravity type cargo tanks.

§ 98.15–15 Pressure-vessel type cargo tanks.

(a) Pressure-vessel type cargo tanks shall be independent of the vessel's structure and shall be designed for the maximum pressure to which they may be subjected when compressed air is used to discharge the cargo, but in no case shall the design pressure be less than 50 pounds per square inch.

(b) Pressure-vessel type cargo tanks shall be designed as Class II or Class III unfired arc-welded cylindrical pressure vessels, inspected and tested as required by Subchapter F (Marine Engineering) of this chapter.

(c) Tanks designed, inspected and tested as required by Interstate Commerce Commission Specification 103B or 103B–W will be accepted as pressure-vessel type cargo tanks: *Provided*, That the maximum pressure to which the tanks may be subjected does not exceed 30 pounds per square inch, and: *Provided further*, That prior to installing such tanks on a barge or cargo vessel, the owner shall furnish the Commandant with a copy of the inspection report certifying that the tanks and appurtenances comply with Interstate Commerce Commission specifications.

(d) When compressed air is used to discharge the cargo, the tank shall be fitted with a vent led to atmosphere in which shall be installed a rupture disc. The rupture disc shall be designed to burst at a pressure not exceeding the design pressure of the tank. An auxiliary vent to relieve the pressure or vacuum in the tank during filling or discharge of the cargo may be led from the vent line between the tank and the rupture disc. A shut-off valve may be fitted in the auxiliary vent.

(e) Except as otherwise specified in this section, the vent shall conform to the requirements of § 98.15–10 (b).

§ 98.15–20 Installation.

(a) Adequate clearance shall be provided for the inspection and maintenance of the tanks, or such tanks shall be made movable.

§ 98.15–25 Openings in tanks.

(a) Openings in tanks are prohibited below deck, except for access openings used for inspection and maintenance of tanks, or unless otherwise specifically approved by the Commandant. Openings shall be fitted with bolted cover plates and acid-resistant gaskets.

§ 98.15–30 Cargo piping.

(a) Where special arrangements are approved by the Commandant to permit a pump suction to be lead from the bottom of the tank, the filling and discharge lines shall be fitted with shut-off valves located above the weather deck or operable therefrom.

§ 98.15–35 Outage.

(a) Sufficient outage shall be provided to prevent the tanks from being liquid full at any time, but in no case shall the outage be less than 1 percent.

§ 98.15–40 Lining.

(a) The interior surfaces of cargo tanks shall be made smooth, welds chipped or ground smooth, and the surfaces thoroughly cleaned before the lining is applied. All interior surfaces of the tanks shall be maintained free from scale, oxidation, moisture and all foreign matter during the lining process.

(b) The rubber or other approved lining material shall be resistive to attack by hydrochloric acid; homogeneous, nonporous, and imperforate when applied; and not less elastic than the metal of the tank proper. It shall be of substantially uniform thickness, not less than ¼ inch for rubber lining. The lining shall be directly bonded to the tank plating, or attached by other satisfactory means acceptable to the Commandant.

(c) Rubber lining shall be scarfed at the joints to overlap at least 1½ inches, and the faying surfaces shall be beveled to an angle of approximately 45 degrees with vulcanizing being done in place.

(d) Cargo piping, including valves, fittings, and flanges, when subject to the corrosive attack of the acid, shall be rubber-lined or coated with other corrosion-resistant material. Vent piping, including flanges and fittings, shall be similarly lined or coated at least to the height of the frangible disc if such is installed.

§ 98.15–45 General requirements.

(a) All enclosed compartments containing hydrochloric acid cargo tanks and all machinery spaces containing cargo pumps for handling hydrochloric acid shall be fitted with effective means of ventilation.

(b) Cargo pumps, piping, valves, fittings, and flanges used in the handling of hydrochloric acid cargo shall be made of material resistive to attack by hydrochloric acid, or shall be suitably protected against such corrosive attack.

(c) A separator shall be fitted in compressed air lines to the tank when air pressure is used to discharge the cargo.

(d) The use of naked lights and artificial lights, other than electric lights or portable battery lights, is prohibited during the filling and discharging operations. Smoking is prohibited and the master or officer in charge of the vessel shall post "No Smoking" signs during filling and discharging operations. All tools used in the loading or unloading operations shall be of the nonsparking type.

(e) A water hose shall be connected ready for immediate use and any leakage or spillage of acid shall be immediately washed down.

(f) Tanks approved for the transportation of hydrochloric acid shall not be used for the transportation of any other commodity, except upon authorization by the Commandant (MMT).

(g) Spent hydrochloric acid or hydrochloric acid adulterated by other chemicals, inhibitors, oils, solvents, water, etc., shall not be transported in bulk cargo tanks except upon authorization by the Commandant (MMT).

(h) While fast to a dock, a vessel during transfer of bulk cargo shall display a red flag by day or a red light by night, which signal shall be so placed that it will be visible on all sides. When at anchor, a vessel during transfer of bulk cargo shall display a red flag by day, which signal shall be so placed that it will be visible on all sides.

§ 98.15–50 Tests and inspections.

(a) Each gravity type cargo tank shall be tested before being placed into service as prescribed in § 98.15–10(a).

(b) Each cargo tank shall be subjected to an internal examination at least once in every four years. Where the lining of the cargo tank has deteriorated in service or is not in place, the marine inspector may require such tank to be subjected to the prescribed hydrostatic test if deemed necessary to determine the condition of the tanks.

Subpart 98.20—Liquid Chlorine in Bulk

§ 98.20–1 General.

(a) Liquid chlorine may be carried in bulk in steel tank barges or steel cargo barges in accordance with the provisions of this subpart.

(b) Any barge carrying liquid chlorine in bulk shall be inspected and certificated in accordance with the provisions of this subchapter or Subchapter D (Tank Vessels) of this chapter, as applicable.

§ 98.20–5 How liquid chlorine may be carried.

(a) Liquid chlorine shall be carried in unfired pressure vessel type tanks independent of the structure of the vessel.

§ 98.20–10 Design and construction of cargo tanks.

(a) The cargo tanks shall meet the requirements of Class I arc-welded unfired pressure vessels and shall be fabricated, inspected and tested in accordance with the applicable requirements of Subchapter F (Marine Engineering) of this chapter.

(b) Tanks shall be designed for a pressure of not less than 300 pounds per square inch. For the maximum allowable pressure of tanks in service see § 98.20–75 (c).

(c) Each tank shall be provided with 15 x 18-inch or 18-inch minimum diameter manhole, fitted with a cover located above the maximum liquid level and as close as possible to the top of the tank.

§ 98.20–15 Markings.

(a) Upon satisfactory completion of tests and inspection, the following markings at least three-eighths inch high shall be stamped into a noncorrodible plate permanently attached to the tank by welding.

(Name and address of fabricator)

---p.s.i.
(Design pressure)

---p.s.i.
(Hydrostatic test pressure)

---p.s.i.
(Maximum allowable pressure)

(Inspector's number, initials and C.G. symbol)

(Manufacturer's serial number)

(Date of manufacture)

---U.S. gallons
(Water capacity)

(b) In addition to the markings required to be stamped on the tank, the legend "chlorine" shall be conspicuously and legibly marked upon the dome or upper portion of the tank in letters at least 4 inches high.

(c) All tank inlet and outlet connections, except safety relief valves shall be labeled to designate whether they terminate in the vapor or liquid space. Labels of noncorrodible material may be attached to the valves.

(d) All tank markings shall be permanently and legibly stamped in a readily visible position.

§ 98.20–20 Installation of cargo tanks.

(a) Independent tanks shall be arranged in the barge so as to provide a minimum clearance of not less than 24 inches from the barge side and not less than 15 inches from the barge bottom. Where more than one tank is installed in a barge, the distance between such tanks shall not be less than 15 inches, unless otherwise approved by the Commandant. Alternate provisions may be made for moving such tanks to provide for adequate inspection and maintenance of barge structure and the tanks.

(b) The design shall show the manner in which the tanks are to be installed, supported, and secured on board the barge and shall be approved prior to the installation. Tanks shall be supported in steel saddles and securely anchored in place. No appendages shall be welded to the tanks after they have been stress-relieved unless authorized by the Commandant.

(c) Tanks may be installed "on deck" or "under deck" with the tank protruding above deck. On installations where a portion of the tank extends above the weather deck, provision shall be made to maintain the weather tightness of the deck, except that barges operating on protected inland waters may have tanks located in the holds of hopper type barges without water-tightness of the deck being maintained. All tanks shall be installed with the manhole opening and fittings located above the weather deck.

(d) The hold or holds in which tanks are located "under deck" shall be provided with mechanical ventilation of sufficient capacity to assure a change of air every 3 minutes.

§ 98.20–25 Cargo tanks on barges.

(a) Sides of tank barges shall be fitted with suitable guards as added precaution against the cargo tanks being damaged as a result of collision.

§ 98.20–30 Valves, fittings, and accessories.

(a) All valves, flanges, fittings and accessory equipment shall be of a type suitable for use with chlorine and shall be made of forged steel, cast steel, or nonferrous metal corrosion resistant to chlorine in either the gas or liquid phase. Valves, flanges and fittings shall be of the square or round tongue and groove type or of raised face, American Standard Association 300-pound standard minimum, fitted with sheet lead or other suitable gasket material. Welding fittings shall be used wherever possible, and the number of pipe joints held to a minimum. Screwed joints in cargo lines and vapor lines are prohibited in sizes above 1 inch.

(b) Each tank shall be provided with safety relief valves and with liquid and vapor connections fitted with manually operated shutoff valves. All valves shall be bolted to the cover or covers specified in § 98.20–10(c), and shall be protected against mechanical damage by a suitable protective metal housing. Other openings in tanks are prohibited. A drain connection shall be provided from the protective housing and led overboard just above the deepest load line.

(c) All liquid and vapor connections, except safety relief valves, shall be fitted with automatic excess flow valves, which shall be located on the inside of the tank.

(d) Excess flow valves, where required by this subpart, shall close automatically at the rated flows of vapor or liquid as specified by the manufacturer. The piping, including valves, fittings, and appur-

tenances, protected by excess flow valves shall have a greater capacity than the rated flow of the excess flow valve.

(e) Liquid level gaging devices of any type are prohibited on chlorine tanks.

(f) A pressure gage shall be attached to the vapor shut-off valve or vapor line so as to indicate the pressure in the tank at all times during loading and unloading.

(g) Bypass openings are not permitted in excess flow valves.

§ 98.20–40 Cargo piping.

(a) Piping shall be of seamless drawn black steel of a thickness of not less than schedule 80.

(b) Piping shall be provided with adequate support to take the weight of the piping off the valves and fittings. Where necessary, provision shall be made for expansion and contraction of piping by means of seamless steel pipe expansion bends. Slip-type expansion joints are prohibited.

(c) In multiple tank installations the tanks shall not be interconnected by piping or manifolds. More than one cargo tank may be filled or discharged at a time, provided each tank is filled from or discharged to shore tanks through separate lines.

§ 98.20–45 Safety relief valves.

(a) Each tank shall be fitted with one or more approved safety relief valves, designed, constructed, and flow tested for capacity in conformance with Subpart 162.018 in Subchapter Q (Specifications) of this chapter. The safety valve requirements in this section are based on unlagged tanks. On lagged tanks, the Commandant will give special consideration to safety valves proposed to be used.

(b) Each safety relief valve shall be set to pop at a pressure not in excess of the maximum allowable pressure of the tank and shall be vapor tight at a pressure of not less than 80 percent of the maximum allowable pressure.

(c) The safety relief valve(s) shall have a relieving capacity sufficient to prevent a rise of pressure in the tank of more than 20 percent above the maximum allowable pressure when the safety relief valve(s) is blowing.

(d) The minimum rates of discharge of safety relief valves used on unlagged tanks shall be not less than determined by the following formula:

$$Q = 53.526A^{0.82} \quad (1)$$

where:

Q = minimum required rate of discharge, in cubic feet per minute, of standard air at 120 percent of the maximum set pressure of the safety relief valve. Discharge measured at 60° F. and atmospheric pressure (14.7 p. s. i. a.).

A = total external surface area of the tank, in square feet. $\pi(D \times U)$, for cylindrical tank with hemispherical heads. $\pi D(U + 0.3D)$, for cylindrical tank with spherically dished or semi-ellipsoidal heads. πD^2, for spherical tank.

D = outside diameter of the tank, in feet.

U = external overall length of the tank, in feet.

(e) Safety relief valve(s) shall be attached to the tank near the highest point of the vapor space. Shut-off valves shall not be installed between the tanks and the safety relief valve(s).

(f) Each safety relief valve shall be tested in the presence of an inspector before or after mounting prior to being placed in service. The test shall prove that the safety valve will start to discharge at a pressure not in excess of the maximum allowable pressure of the tank. (For periodic tests see § 98.20–75 (c).)

§ 98.20–50 Filling density.

(a) The filling density, or the percent ratio of the liquefied gas that may be loaded into the tank to the weight of water the tank will hold at 60° F., shall not exceed 125 percent.

§ 98.20–55 Venting.

(a) Cargo tanks of tank barges shall have the safety relief valve outlets connected to individual or common risers which shall extend to a reasonable height above the deck, or, the safety relief valve escape may be led to a common discharge header. Where the escape of vapors from the venting system may interfere with towing operations or the operation of the barge in inland waters would be a hazard to installations extending above deck, an installation acceptable to the Commandant may be used. This arrangement shall be such as to minimize the hazard of escaping vapors.

(b) The capacity of branch vents or vent headers shall depend upon the number of cargo tanks connected to such branch or header as provided in Table 98.20–55 (b).

TABLE 98.20–55 (b)—CAPACITY OF BRANCH VENTS OR VENT HEADERS

Number cargo tanks:	*Percent total valve discharge*
1 or 2	100
3	90
4	80
5	70
6 or more	60

(c) Return bends and restrictive pipe fittings are prohibited. Vents and headers shall be so installed as to prevent stresses on safety relief valve mountings.

(d) When vent discharge risers are installed, they shall be so located as to provide protection against physical damage and be fitted with loose raincaps.

(e) Suitable provision shall be made for draining the vent escape piping if liquid can collect therein.

§ 98.20–60 Filling and discharge operation.

(a) The maximum amount of liquid chlorine that may be loaded into the cargo tanks shall be determined by weight and shall not exceed the filling density specified in § 98.20–50. Any chlorine vapors vented during the filling operation shall be disregarded when calculating the maximum amount of chlorine to be loaded into the cargo tanks.

(b) Prior to the start of filling operations, care shall be exercised to insure that the cargo tank(s) is empty and free from foreign matter. After all pipe connections and fittings are made tight, the cargo tank(s) shall be evacuated to at least 20 inches of mercury.

(c) The chlorine shall be loaded through a direct pipe line from the shore tank that is mounted on scales so that an amount of chlorine predetermined by weight is loaded into the cargo tank(s) on board the barge.

(d) After the filling operation is completed the vapor above the liquid chlorine in the cargo tank shall be analyzed to determine the percentage of gaseous chlorine in the vapor space. If it should contain less than 80 percent chlorine, vapors shall be withdrawn through the vent or vapor line until the vapor content in the cargo tanks show at least 80 percent chlorine.

(e) After filling connections are removed, upon completion of the loading of a cargo tank, all connections at the tank shall be tested for leakage of chlorine by the aqua ammonia method.

(f) The chlorine in the cargo tanks shall be discharged by the pressure differential method. Where the vapor pressure of the chlorine is not sufficient to force the liquid out of the tank, compressed air may be used to secure the desired rate of discharge, provided the air is oil-free and thoroughly dried by passing it over activated aluminum oxide, silica gel, or other acceptable drying agent. The compressed air system shall contain a relief valve arranged and set so that the air pressure in the cargo tank cannot exceed 70 percent of the allowable pressure of the tank.

(g) After completion of the filling or discharge operations, the excess liquid chlorine in the cargo piping shall be removed. The filling and discharge piping shall be disconnected at the cargo tanks, except during filling and discharge operations. After disconnecting the cargo piping, both ends of the line shall be closed and all inlet and outlet valves on the tank shall be plugged or fitted with blind flanges.

(h) Plans showing alternate methods of filling and discharging the lading may be submitted for approval.

§ 98.20–65 Cargo hose.

(a) Cargo hose fabricated of Schedule 80 seamless black steel pipe, or corrosion resistant metallic pipe not subject to deterioration by chlorine, having metallic flexible joints, or other types of flexible metallic hose acceptable to the Commandant, shall be fitted to the liquid or vapor lines during filling and discharging of the cargo tanks.

(b) Cargo hose subject to tank pressure shall be designed for a bursting pressure of not less than five times the maximum safety relief valve setting of the tanks.

(c) Before being placed in service, each new cargo hose, with all necessary fittings attached, shall be hydrostatically tested by the manufacturer to a pressure of not less than twice the maximum pressure to which it may be subjected in service. The hose shall be marked with the maximum pressure guaranteed by the manufacturer.

§ 98.20–70 Special operating requirements.

(a) (1) Repairs involving welding or burning shall not be undertaken on the cargo tanks or piping while chlorine in either the liquid or vapor state is present in the system.

(2) Other repairs involving welding or burning equipment may be undertaken on the chlorine barge provided a positive pressure is maintained on the tanks by the vapors remaining after the cargo has been discharged.

(b) During the time chlorine is laden in the tanks the barge shall be under constant surveillance. A towing vessel engaged in towing such barges shall not leave the barge unattended except when the barge is moored at a pier, wharf, dock, or other terminal, and then only if such facility is provided with watchman or guard service. When the barge is at the consignor's or consignee's terminal, watchman or guard service shall be provided by said consignor or consignee.

(c) The Interstate Commerce Commission's standard "Dangerous" placard shall be displayed in four locations on the barge when chlorine is laden in the tanks. A placard shall be posted approximately amidships on each side and facing outboard. A placard shall also be posted on each end of the barge at about the ends of the tanks facing outboard. Racks for mounting such placards shall be so arranged as to provide clear visibility and be protected from becoming readily damaged or obscured. After unloading and before a tank or tanks are gas-freed, the placard shall be reversed to show the "Dangerous—Empty" legend.

(d) (1) At least one approved self-contained breathing apparatus shall be available in a readily accessible location off the barge at all times during the filling and discharge operations. This equipment shall not be considered to be part of the barge equipment, and the barge shall not be required to carry this equipment en route.

(2) The approved self-contained breathing apparatus shall be of a type suitable for starting and operating at the temperatures encountered, and shall be maintained in good operating condition.

(3) Personnel involved in the filling or discharge operations shall be adequately trained in the use of the equipment.

(4) During filling or discharge operations every person on the barge shall carry on his person a respiratory protective device which will protect the wearer against chlorine vapors and provide respiratory protection for emergency escape from a contaminated area which would result from cargo leakage. This respiratory protective equipment shall be of such size and weight that the person wearing it will not be restricted in movement or in the wearing of a life-saving device.

(e) Unless authorized by the Commandant (MMT), no other kind of cargo except liquid caustic soda shall be on board a barge at the same time that chlorine in liquid or vapor state is present in a cargo tank. Chlorine tanks shall not be installed within caustic soda tanks.

(f) Authorization from the Commandant (MMT) shall be obtained to transport lading other than chlorine in tanks of this service.

(g) While fast to a dock, a vessel during transfer of bulk cargo shall display a red flag by day or a red light by night, which signal shall be so placed that it will be visible on all sides. When at anchor, a vessel during transfer of bulk cargo shall display a red flag by day, which signal shall be so placed that it will be visible on all sides.

(R.S. 4491, as amended; 46 U.S.C. 489)

§ 98.20–75 Tests and inspections.

(a) Each cargo tank shall be subjected to an internal and external examination biennially.

(b) Each cargo tank shall be subjected to hydrostatic test biennially of one and one-half times the maximum allowable pressure as determined by the safety relief valve setting.

(c) When periodic inspection indicates that a cargo tank has deteriorated in service, the maximum allowable pressure shall be recalculated, using the minimum thickness found by actual measurement. The recalculated maximum allowable pressure shall be not less than 275 pounds per square inch; otherwise, the cargo tanks shall be withdrawn from service.

(d) The safety relief valves shall be popped in the presence of an inspector by use of water, compressed air, or inert compressed gas at the time of the biennial inspection, or at such time as may be required by the inspector to determine the accuracy of adjustment; and, if necessary, such valves shall be repaired and reset.

§ 98.20–80 Stores on board.

(a) The following substances shall not be used as stores on board barges transporting chlorine in bulk: Hydrogen, methane, liquefied petroleum gases, coal gas, acetylene, ammonia, turpentine, compounds containing metallic powders, finely divided metals or finely divided organic materials.

Subpart 98.25—Anhydrous Ammonia in Bulk

§ 98.25–1 General.

(a) Anhydrous ammonia may be carried in bulk in cargo barges, tank barges, or cargo vessels in accordance with the provisions of this subpart.

(b) Any vessel carrying anhydrous ammonia in bulk shall be inspected and certificated in accordance with the provisions of this subchapter or Subchapter D (Tank Vessels) of this chapter as applicable.

§ 98.25–5 How anhydrous ammonia may be carried.

(a) Anhydrous ammonia shall be carried in unfired pressure vessel type tanks independent of the structure as detailed in this part, except as otherwise provided in paragraph (b) of this section.

(b) When anhydrous ammonia is to be transported at its boiling temperature at or near atmospheric pressure, the Commandant may permit the use of alternate methods of storage if it is shown to his satisfaction that a degree of safety is obtained consistent with the minimum requirements of this subpart.

§ 98.25–10 Design and construction of cargo tanks.

(a) The cargo tanks shall meet the requirements for Class I or Class II arc-welded unfired pressure vessels and shall be fabricated, inspected and tested in accordance with the applicable requirements of Subchapter F (Marine Engineering) of this chapter.

(b) Unlagged cargo tanks subject to atmospheric temperatures shall be designed for a pressure of not less than 250 pounds per square inch gage.

(c) Where unrefrigerated cargo tanks are lagged as required by §§ 98.25–30 and 98.25–60, the tanks shall be designed for a pressure of not less than 215 pounds per square inch gage.

(d) Refrigerated cargo tanks, in which the temperature of the liquid ammonia is maintained below the normal atmospheric temperatures, shall be designed for a pressure of not less than the vapor pressure corresponding to the temperature of the liquid at which the system is to be maintained, plus 25 pounds per square inch gage.

(e) Each tank shall be provided with not less than a 15" x 18" diameter manhole, fitted with a cover located above the maximum liquid level and as close as possible to the top of the tank. Where access trunks are fitted to tanks, the diameter of the trunks shall be not less than 30 inches.

(R.S. 4417, as amended, 4418, as amended, 4426, as amended, 4453, as amended, secs. 1, 2, 49 Stat. 1544, as amended; 46 U.S.C. 391, 392, 404, 435, 367)

§ 98.25–15 Markings.

(a) Upon satisfactory completion of tests and inspection, the following marking, at least ⅜ inch high, shall be stamped into a noncorrodible nameplate permanently attached to the tank by means of welding.

(Name and address of fabricator)

---- p.s.i.
(Design pressure)

---- p.s.i.
(Hydrostatic test pressure)

---- p.s.i.
(Maximum allowable pressure)

(CG inspector's number, initials, symbol)

(Manufacturer's serial number)

----U.S. gallons
(Water capacity)

(Date of manufacture)

(b) In addition to the markings required to be stamped on the tank, the legend, "Anhydrous Ammonia" shall be conspicuously and legibly marked upon

the dome or upper portion of the tank in letters at least 4 inches high.

(c) All tank inlet and outlet connections, except safety relief valves, liquid level gaging devices, and pressure gages shall be labeled to designate whether they terminate in the vapor or liquid space. Labels of noncorrosive material may be attached to valves.

(d) All tank markings shall be permanently and legibly stamped in a readily visible position. If the tanks are lagged, the markings attached to the tank proper shall be duplicated on a corrosion resistant plate secured to the outside jacket of the lagging.

§ 98.25–20 Installation of cargo tanks.

(a) Independent tanks shall be arranged in the barge or vessel so as to provide a minimum clearance of not less than 24 inches from the vessel's side and not less than 15 inches from the vessel's bottom. Where more than one tank is installed in a vessel, the distance between such tanks shall be not less than 15 inches, unless otherwise approved by the Commandant. Alternate provisions may be made for moving such tanks to provide for adequate inspection and maintenance of the vessel's structure and the tanks.

(b) The design shall show the manner in which the tanks are to be installed, supported, and secured in the barge or vessel and shall be approved prior to installation. Tanks shall be supported in steel saddles and securely anchored in place. If the tanks are required to be stress-relieved no appendages shall be welded to the tanks after they have been stress-relieved unless authorized by the Commandant.

(c) Tanks may be located in dry cargo holds or in liquid cargo tanks or may be installed "on deck" or "under deck" with the tank protruding above deck. On installations where a portion of the tank extends above the weather deck, provision shall be made to maintain the weathertightness of the deck, except that vessels operating on protected inland waters may have tanks located in the holds of hopper type barges without the watertightness of the deck being maintained. All tanks shall be installed with the manhole opening and fittings located above the weather deck.

(d) The anhydrous ammonia tanks may be installed in the bulk liquid cargo tanks provided the liquid surrounding the enclosed anhydrous ammonia tanks complies with the following chemical and physical properties:

(1) Boiling point above 125° F. at atmospheric pressure.

(2) Inert to ammonia at 100° F. at atmospheric pressure.

(3) Noncorrosive in the liquid and vapor phase to the ammonia tanks and piping.

§ 98.25–25 Cargo tank barges.

(a) Tanks having a cargo capacity of not more than 60,000 gallons may form part of the structure of a barge where adequate provision is made to prevent damage to tanks in the event of collision or grounding.

(b) Sides of tank barges shall be fitted with suitable guards as an added precaution against the cargo tanks being damaged as a result of collision.

§ 98.25–30 Lagging.

(a) Lagged tanks shall be covered with an incombustible insulation material of a thickness to provide a thermal conductance of not more than 0.075 B.t.u. per square foot per degree F. differential in temperature per hour. The insulating material shall be of an approved type complying with the requirements of Subpart 164.009 of Subchapter Q (Specifications) of this chapter, and shall be given a vapor proof coating with fire retardant material acceptable to the Commandant. Tanks exposed to the weather shall have the insulation and vapor proof coating covered with a removable sheet metal jacket of not less than 0.083 inch thickness and flashed around all openings so as to be weather tight. Materials other than sheet metal may be used to cover the insulation and vapor proof coating when specifically authorized by the Commandant.

(b) Where unlagged tanks are installed in insulated holds or insulated 'tween deck spaces, such tanks shall be considered lagged provided the thermal conductance of the insulation is not less than that required by paragraph (a) of this section.

§ 98.25–35 Refrigerated systems.

(a) Where refrigerated systems are installed to maintain the temperature of the liquid below atmospheric, at least two complete refrigeration plants automatically regulated by pressure variations within the tanks shall be provided, each to be complete with the necessary auxiliaries for proper operation. The capacity of each refrigeration compressor shall be sufficient to maintain the vapor pressure in the tanks during the peak atmospheric temperature conditions below the pressure for which the tanks are designed.

(b) An alternate arrangement may consist of three compressors, any two of which shall be capable of maintaining the vapor pressure in the tanks during peak atmospheric temperature conditions below the pressure for which the tanks are designed, the third compressor acting as a stand-by unit.

(c) Refrigerated tanks shall be insulated in conformance with the requirements of § 98.25–30.

§ 98.25–40 Valves, fittings, and accessories.

(a) All valves, flanges, fittings, and accessory equipment shall be of a type suitable for use with anhydrous ammonia and shall be made of steel, Grade A malleable iron or nodular iron conforming to the requirements of Part 51 of Subchapter F (Marine Engineering) of this chapter. Valves shall be fitted with non-corrosive material suitable for ammonia service. Valves, flanges and pipe fittings shall be of the square or round tongue and groove type or raised-face, American Standard Association 300-pound standard minimum, fitted with suitable soft gasket material. Welded fittings shall be used wherever possible and the number of pipe joints shall be held to a minimum. Screwed joints are not permitted for pipe diameters exceeding two inches. Nonferrous materials, such as copper, copper alloys and aluminum alloys shall not be used in the construction of valves, fittings or accessory equipment. Brazed joints are prohibited.

(b) Each tank shall be provided with the necessary fill and discharge liquid and vapor shut-off valves, safety relief valves, liquid level gaging devices, thermometer well and pressure gage, and shall be provided with suitable access for convenient operation. Connections to tanks installed below the weather deck shall be made to a trunk or dome extending above the weather deck. Tanks installed on hopper barges shall have all pipe connections attached to the top of the tanks. Connections to the tanks shall be protected against mechanical damage and tampering. Other openings in the tanks, except as specifically permitted by this part, are prohibited.

(c) All connections to the tanks, except safety devices and liquid level gaging devices, shall have manually operated shut-off valves located as close to the tank as possible.

(d) Excess flow valves where required by this section shall close automatically at the rated flow of vapor or liquid as specified by the manufacturer. The piping, including valves, fittings and appurtenances, protected by an excess flow valve, shall have a greater capacity than the rated flow of the excess flow valve.

(e) Liquid level gaging devices which are so constructed that outward flow of tank contents shall not exceed that passed by a No. 54 drill size opening, need not be equipped with excess flow valves.

(f) Pressure gage connections need not be equipped with excess flow valves if the openings are not larger than No. 54 drill size.

(g) Excess flow valves may be designed with a bypass, not to exceed a No. 60 drill size opening, to allow equalization of pressure.

(h) Prior to disconnecting shore lines, the pressure in the liquid and vapor lines shall be relieved through suitable valves installed at the loading header.

(i) Relief valves shall be fitted in liquid lines which may be subject to excessive pressure caused by liquid full condition, and the escape from the relief valves shall be piped to the venting system.

(j) The pressure gage shall be located at the highest practical point. The thermometer well shall terminate in the liquid space and be attached to the shell by welding with the end of the fitting being provided with a gas-tight screwed plug or bolted cover.

§ 98.25-45 Liquid level gaging device.

(a) Each tank shall be fitted with a liquid level gaging device of suitable design to indicate the maximum level to which the tank may be filled with liquid at temperatures between 20° F. and 130° F.

(b) Liquid level gaging devices shall be of the following types: magnetic, rotary tube, slip tube, fixed tube, automatic float, or other types acceptable to the Commandant.

(c) Gaging devices that require bleeding of the product to the atmosphere, such as rotary tube, fixed tube, and slip tube, shall be so designed that the bleed valve maximum opening is not larger than a No. 54 drill size, unless provided with an excess flow valve.

(d) Gaging devices shall have a design pressure of at least 250 pounds per square inch.

(e) Gage glasses of the columnar type are prohibited.

§ 98.25–50 Filling and discharge pipes.

(a) Filling connections shall be provided with one of the following:

(1) Combination back pressure check valve and excess flow valve;

(2) One double or two single back pressure check valves; or

(3) A positive shut-off valve in conjunction with either an internal back pressure check valve or an internal excess flow valve.

(b) All other liquid and vapor connections to tanks, except filling connections, safety relief valves, and liquid level gaging devices and pressure gages described in § 98.25–40 (e) and (f) shall be equipped with automatic excess flow valves; or in lieu thereof, may be fitted with quick closing internal stop valves, which, except during filling and discharge operations, shall remain closed. The control mechanism for such valves shall be provided with a secondary remote control of a type acceptable to the Commandant.

(c) The excess flow, internal stop or back pressure check valves shall be located on the inside of the tank or outside where the piping enters the tank. In the latter case, installation shall be made in such a manner that any undue strain will not cause breakage between the tank and the excess flow or internal stop valve.

(d) Where the filling and discharge are made through a common nozzle at the tank, and the connection is fitted with a quick-closing internal stop valve as permitted in paragraph (b) of this section, the back pressure check valve or excess flow valve is not required, provided, however, a positive shut-off valve is installed in conjunction with the internal stop valve.

(e) On tanks installed in barges operating on protected inland waters the suction may be taken from the bottom of the tank provided requirements as follows are met:

(1) A manually operated shut-off valve is attached to the outlet nozzle and a remotely operated internal stop valve is fitted inside the tank.

(2) The remotely controlled valve shall be operable from control stations located at each end of the barge so that the remotely controlled valve on any tank can be closed from either station.

§ 98.25–55 Cargo piping.

(a) Piping shall be of seamless drawn black steel of thickness not less than Schedule 40. In case of piping on the discharge side of the liquid pumps or vapor compressors, the design shall be for a pressure of not less than the pump or compressor relief valve setting; or if the piping is not fitted with relief valves, the design pressure shall not be less than the total discharge head of the pump or compressor.

(b) Where necessary, provision shall be made for expansion and contraction of piping by means of seamless steel pipe expansion bends. Special consideration will be given for packless type expansion joints. Slip type expansion joints are prohibited. Piping shall be provided with adequate support to take the weight of the piping off the valves and fittings.

§ 98.25–60 Safety relief valves.

(a) Each tank shall be fitted with two or more approved safety relief valves, designed, constructed and flow-tested for capacity in conformance with Subpart 162.018 of Subchapter Q (Specifications) of this chapter.

(b) Each safety relief valve shall start to discharge at a pressure not in excess of the design pressure of the tank.

(c) The safety relief valves shall have a combined relieving capacity sufficient to prevent a rise of pressure in the tank of more than 20 percent above the maximum allowable pressure when all the safety relief valves are blowing.

(d) (1) The minimum rates of discharge of safety relief valves for uninsulated tanks shall be not less than that determined by the following formula:

$$Q = 21.63A^{0.82} \qquad (1)$$

where:

Q = minimum required rate of discharge in cubic feet per minute of standard air at 120 percent of the maximum set pressure of the safety relief valve. Discharge measured at 60° F. and atmospheric pressure (14.7 p.s.i.a.).

A = total external surface area of the tank, in square feet.

$A = \pi(D \times U)$ for cylindrical tanks with hemispherical heads.

$A = \pi D(U + 0.3D)$ for cylindrical tanks with spherically dished or semiellipsoidal heads.

$A = \pi D^2$ for spherical tanks.

D = outside diameter of the tanks, in feet.

U = external overall length of the tank, in feet.

(2) The minimum rate of discharge of safety relief valves for lagged tanks insulated in conformance with § 98.25–30 need only be 50 percent of the capacity required for uninsulated tanks.

(e) Safety relief valves shall be attached to the tank near the highest point of the vapor space. Shut-off valves shall not be installed between the tanks and the safety relief valves, except manifolds for mounting multiple safety relief valves may be fitted with acceptable interlocking 3-way valves so arranged at all times as to permit at any position of the 3-way valve, an unrestricted flow of vapors through at least one port. When two safety relief valves are mounted in parallel on both the upper outlets of the 3-way valve, the arrangement shall be such as to permit at least one safety relief valve to be operative at all times.

(f) Each safety valve shall be tested in the presence of an inspector at the site of installation before or after mounting prior to being placed in service. The tests shall prove that the safety relief valve will start to discharge at a pressure not in excess of the maximum allowable pressure of the tank.

§ 98.25–65 Filling density.

(a) The filling density, or the percent ratio of the liquefied gas that may be loaded in the tank to the weight of the water the tank will hold at 60° F., shall not exceed 56 percent for unlagged tanks and 58 percent for lagged or refrigerated tanks.

§ 98.25–70 Venting.

(a) Except as provided in paragraph (b) of this section, each safety valve installed on a cargo tank shall be connected to a branch vent of a venting system which shall be constructed so that the discharge of gas will be directed vertically upward to a point at least 10 feet above the weather deck or the top of any tank or house located above the weather deck.

(b) Safety valves on cargo tanks in barges may be connected to individual or common risers which shall extend to a reasonable height above the deck. Where the escape of vapors from the venting system may interfere with towing operations, the installation shall be acceptable to the Commandant and the arrangement shall be such as to minimize the hazard of escaping vapors. Arrangements specially provided for venting cargo tanks forming part of the hull on unmanned barges will be given special consideration by the Commandant.

(c) The capacity of branch vents or vent headers shall depend upon the number of cargo tanks connected to such branch or header as provided in Table 98.25–70 (c).

TABLE 98.25–70 (c)—CAPACITY OF BRANCH VENTS OR VENT HEADERS

Number of cargo tanks:	*Percent of total valve discharge*
1 or 2	100
3	90
4	80
5	70
6 or more	60

(d) In addition to the requirement specified in paragraph (c) of this section, the size of the branch vents or vent headers shall be such that the back pressure in relief valve discharge lines shall not be more than 10 percent of the safety relief valve setting.

(e) Return bends and restrictive pipe fittings are prohibited. Vents and headers shall be so installed as to prevent stresses on safety relief valve mountings.

(f) When vent discharge risers are installed, they shall be so located as to provide protection against physical damage and be fitted with loose raincaps.

(g) No shut-off valve shall be fitted in the venting system between the safety relief valve and the vent outlets. Suitable provision shall be made for draining

the venting system if liquid can collect therein.

§ 98.25–75 Ventilation.

(a) All enclosed spaces containing cargo tanks fitted with bottom outlet connections shall be provided with mechanical ventilation of sufficient capacity to assure a change of air every 3 minutes. Where cargo tanks are fitted with top outlet connections, the enclosed spaces containing such tanks shall be fitted with efficient natural or mechanical ventilation.

(b) Enclosed compartments in which machinery such as cargo pumps or vapor compressors are located shall be adequately ventilated.

§ 98.25–80 Cargo hose.

(a) Cargo hose fabricated of seamless steel pipe with swivel joints, wire braided armored rubber or other hose material acceptable to the Commandant, shall be fitted to the liquid or vapor lines during filling and discharging of the cargo tanks.

(b) Hose subject to tank pressure shall be designed for a bursting pressure of not less than five times the maximum safety relief valve setting of the tank.

(c) Hose subject to discharge pressure of pumps or vapor compressors shall be designed for a bursting pressure of not less than five times the pressure setting of the pump or compressor relief valve.

(d) Before being placed in service, each new cargo hose, with all necessary fittings attached, shall be hydrostatically tested by the manufacturer to a pressure of not less than twice the maximum pressure to which it may be subjected in service. The hose shall be marked with the maximum pressure guaranteed by the manufacturer.

§ 98.25–85 Electrical bonding.

(a) Each cargo tank shall be electrically grounded to the hull. The cargo barge or vessel shall be electrically connected to the shore piping prior to connecting the cargo hose. This electrical connection shall be maintained until after the cargo hose has been disconnected and any spillage has been removed.

§ 98.25–90 Special operating requirements.

(a) (1) Repairs involving welding or burning shall not be undertaken on the cargo tanks or piping while anhydrous ammonia in either the liquid or vapor state is present in the system.

(2) Other repairs involving the use of welding or burning equipment may be undertaken on the anhydrous ammonia barge provided a positive pressure is maintained on the tanks by the vapors remaining after the cargo has been discharged.

(b) During the time anhydrous ammonia is laden in the tanks the barge or vessel shall be under constant surveillance. A vessel engaged in towing such barges shall not leave the barge unattended except when the barge is moored at a pier, wharf, dock, or other terminal and then only if such facility is provided with watchman or guard service. When the barge is at the consignor's or consignee's terminal, watchman, or guard service shall be provided by said consignor or consignee.

(c) The Interstate Commerce Commission's standard "Dangerous" placard shall be displayed in four locations on the barge when anhydrous ammonia is laden in the tanks. A placard shall be posted approximately amidships on each side and facing outboard. A placard shall be posted at each end of the barge at about the ends of the tanks facing outboard. Racks for mounting such placards shall be so arranged as to provide clear visibility and be protected from becoming readily damaged or obscured. After unloading and before the tank or tanks are gas-freed, the placard shall be reversed to show the "Dangerous—Empty" legend.

(d) Authorization from the Commandant (MMT) shall be obtained to transport lading other than anhydrous ammonia in the cargo tanks.

(e) Sufficient hose stations shall be installed with adequate water supply so that if leakage of anhydrous ammonia occurs the vapors may be removed by use of a stream of water.

(f) (1) For a manned vessel, at least two units of approved self-contained breathing apparatus, one stowed forward of the cargo tanks and one stowed aft of the cargo tanks, shall be carried on board the vessel at all times.

(2) For an unmanned vessel, at least one approved self-contained breathing apparatus shall be available in a readily accessible location off the vessel at all times during the filling and discharge operations. This equipment shall not be considered to be part of the vessel equipment, and the vessel shall not be required to carry this equipment en route.

(3) All approved self-contained breathing apparatus, masks and respiratory protective devices shall be of types suitable for starting and operating at the temperatures encountered, and shall be maintained in good operating condition.

(4) Personnel involved in the filling or discharge operations shall be adequately trained in the use of the equipment.

(5) For all manned and unmanned vessels, during filling or discharge operations every person on the vessel shall carry on his person or have close at hand at all times a canister mask approved for ammonia; or each person shall carry on his person a respiratory protective device which will protect the wearer against ammonia vapors and provide respiratory protection for emergency escape from a contaminated area which would result from cargo leakage. This respiratory protective equipment shall be of such size and weight that the person wearing it will not be restricted in movement or in the wearing of a lifesaving device.

(g) While fast to a dock, a vessel during transfer of bulk cargo shall display a red flag by day or a red light by night, which signal shall be so placed that it will be visible on all sides. When at anchor, a vessel during transfer of bulk cargo shall display a red flag by day, which signal shall be so placed that it will be visible on all sides.

(R.S. 4491, as amended; 46 U.S.C. 489)

§ 98.25–95 Tests and inspections.

(a) Each cargo tank shall be subjected to an internal examination at least once in each 8 calendar years. Each lagged tank shall be subjected to an external inspection at least once in each 8 calendar years by having the jacket and lagging removed. An external examination of unlagged tanks and the visible parts of lagged tanks shall be made at each biennial inspection.

(b) A hydrostatic test of 1½ times the maximum allowable pressure as determined by the safety relief valve setting shall be made at any time that the inspector considers such hydrostatic test necessary to determine the condition of the tank. If the jacket and lagging are not removed during the hydrostatic tests prescribed in this paragraph, the tank shall hold the hydrostatic test pressure for at least 20 minutes without a pressure drop.

(c) The safety relief valves shall be popped in the presence of a marine inspector by either liquid, gas or vapor pressure at least once every four years to determine the accuracy of adjustment and, if necessary, shall be reset.

Subpart 98.30—Nuclear Energy

§ 98.30–1 Vessels handling radioactive materials.

(a) All vessels handling or processing radioactive materials in substantial amounts other than as cargo shall comply with the applicable requirements in Subpart 57.30 of Subchapter F (Marine Engineering) of this chapter. The regulations covering the transportation and handling of radioactive materials as cargo are contained in Part 146 of Subchapter N (Dangerous Cargoes) of this chapter.

(Sec. 2, 23 Stat. 118, as amended, secs. 2, 633, 63 Stat. 496, 545; 46 U.S.C. 2, 14 U.S.C. 2, 633. Interpret or apply sec. 14, 29 Stat. 690, as amended, sec. 3, 54 Stat. 347, as amended, sec. 3, 70 Stat. 152; 46 U.S.C. 366, 367, 1333, 390b.)

Subpart 98.35—Portable Tanks for Combustible Liquids

§ 98.35–1 Scope.

(a) The provisions in this subpart contain requirements for the construction, testing, loading, discharging and stowage of portable tanks for the transportation of combustible liquids on board cargo vessels. The regulations apply to portable tank which are capable of being lifted in a loaded condition on and off the vessel. The portable tanks may be filled ashore and then loaded aboard the vessel, or the portable tanks may be loaded and/or discharged after the portable tanks are secured aboard the vessel.

(b) The provisions of this subpart apply to United States' flag vessels subject to the regulations in this chapter and to all foreign vessels when such vessels are on the navigable waters of the United States, its territories and possessions, but

not including the Panama Canal Zone, and which have on board combustible liquid cargo in portable tanks other than in drums, barrels or other packages.

(c) Foreign vessels from countries having similar or equivalent rules or regulations for the design, construction, testing and inspection of portable tanks containing combustible liquids may have such tanks inspected and certified by their own Governments, and such tanks will be considered as meeting such requirements in this subpart; however, such vessels shall comply with §§ 98.35-25, 98.35-30, and 98.35-35 regarding location and stowage, firefighting equipment, and special operating requirements during the transfer of cargo or during the lifting of portable tanks on or off the vessel.

(d) Special consideration may be given to the approval of existing portable tanks which have been authorized prior to March 1, 1963, by the Coast Guard for use on vessels. The Interstate Commerce Commission's approved tank cars and tank trucks (for flammable liquids) and specification ICC-51 portable tanks are accepted as meeting the provisions of this subpart. Except for the ICC containers, all existing portable tanks shall otherwise meet the requirements for testing, inspection, and marking as set forth in this subpart for new tanks.

(e) The regulations covering the transportation in portable tanks of combustible liquids defined as Class B or C poisons are contained in Part 146 of Subchapter N (Dangerous Cargoes) of this chapter.

§ 98.35-3 Authorization for special commodities.

(a) General authorization is hereby given for paraffinic hydrocarbons to be transported in portable tanks.

(b) Authorization shall be obtained from the Commandant for each seperate commodity, other than paraffinic hydrocarbons, prior to its transportation in portable tanks.

§ 98.35-5 Definitions.

(a) A portable tank, within the meaning of this subpart, is a cargo tank having a capacity greater than 110 gallons and which is independent of the vessel's structure. (See § 90.05-30 of this subchapter for interpretive rulings on portable containers.)

(b) The term "combustible liquids" shall mean any liquid having a flashpoint above 80° F. (as determined in an open-cup tester, as used for test of burning oils).

§ 98.35-7 Plan approval.

(a) Plans in quadruplicate showing the details of construction of portable tanks shall be submitted to the Commandant (MMT), U.S. Coast Guard, 1300 "E" Street NW., Washington, D.C., 20226, for approval.

(b) The plans may be submitted directly to field technical offices.

(1) Commander, 3d Coast Guard District (mmt), 45 Broadway, New York, N.Y., 10006, for the geographical area covered by 1st, 3d and 5th Coast Guard Districts.

(2) Commander, 8th Coast Guard District (mmt), Room 308, Customhouse, New Orleans, La., 70130, for geographical area covered by 2d, 7th and 8th Coast Guard Districts.

(3) Commander, 12th Coast Guard District (mmt), 630 Sansome St., San Francisco, Calif., 94501, for geographical area covered by 11th, 12th, 13th, 14th, and 17th Coast Guard Districts.

(c) A manufacturer desiring to construct a portable tank or tanks which are identical with a portable tank previously approved by the Commandant (mmt) shall not be required to submit plans, but shall submit to the Officer in Charge, Marine Inspection, a certificate that the proposed portable tank conforms in every respect with the plans previously approved. Such certificate shall include the manufacturer's serial number, the drawing number or numbers, and the date of approval. If, upon examination, the Officer in Charge, Marine Inspection, ascertains that the said approved plans meet the current requirements of this subpart, the manufacture of such portable tank(s) shall be authorized.

§ 98.35-10 Construction.

(a) Portable tanks shall be designed to be lifted on and off the vessel with contents or otherwise moved from place to place as a normal part of the vessel's operation.

(b) Gravity type portable tanks intended for "on deck" stowage only shall be designed for a head of liquid to the top of the vent, but in no case less than 4 pounds per square inch. Pressure vessel type portable tanks intended for stowage below the weather deck shall be designed for a pressure of not less than 30 pounds per square inch in addition to the head of the liquid. In addition to the internal pressure and liquid head, tanks and handling arrangements shall be designed to withstand the static and dynamic stresses imposed by support and handling operations. Portable tanks designed for pressures exceeding 10 pounds per square inch shall meet the requirements for unfired pressure vessels in Subchapter F (Marine Engineering) of this chapter. When portable tanks are intended for tiering or cellular loading, the structural support shall be designed to carry the stresses due to external loading.

(c) Portable tanks having a horizontal length or width of over 15 feet shall be fitted with a swash bulkhead for each 15 feet of either dimension. Where considered necessary for stability in handling, additional swash bulkheads may be required. The openings in swash bulkheads shall be small enough to effectively prevent surging of the liquid contents.

(d) Each portable tank shall be fitted with not less than a 15-inch by 23-inch or an 18-inch diameter manhole located on the top of the tank. Special consideration may be given to approval of portable tanks which meet applicable ICC specifications with respect to access openings.

(e) All bottom outlets shall be suitably protected against physical damage.

§ 98.35-13 Venting.

(a) Gravity type portable tanks intended for on deck stowage only shall be fitted with gooseneck vents and corrosion resistant flame screens, or with approved pressure-vacuum relief valves set to relieve at pressures not in excess of 4 pounds per square inch.

(b) Pressure vessel type portable tanks intended for on deck stowage only shall be fitted with gooseneck vents and corrosion resistant flame screens, or with approved pressure-vacuum relief valves, or with approved spring loaded relief valves and vacuum relief valves. The settings of all relief valves shall be not more than the design pressure of the tank.

(c) Pressure vessel type portable tanks intended for stowage below the weather deck shall be fitted with an approved vacuum relief valve and with an approved spring-loaded relief valve set at a pressure of not less than 30 pounds per square inch but not in excess of the design pressure of the tank.

(d) The size of all fittings prescribed in paragraphs (a), (b), and (c) of this section shall be not less than the size of the filling line, but in no case less than 2½ inches nominal pipe size. All venting fittings shall be attached at or near the highest point in the vapor space.

§ 98.35-15 Markings.

(a) Each portable tank shall be fitted with a permanent nameplate containing the following:

(Name and address of owner)

(Name and address of manufacturer)
Capacity ____
(U.S. gals.)
Date built ____
(Month, year)
Maximum filling capacity ____
(U.S. gals.)
Maximum design weight ____ lbs.
Light weight ____ lbs.
Design pressure ____ p.s.i.
Test pressure ____ p.s.i.
Initial inspection ____
(Date)
By ____
(Initials of C.G. inspector)
Manufacturer's serial number ____
Tank material ____
Periodic testing ____
(Date and initials of C.G. inspector)
Periodic testing ____
Periodic testing ____

(b) The material for the nameplate shall be of corrosion resistant metal.

(c) The data shall be legibly stamped or embossed and shall not be obliterated during the life of the portable tank. The nameplate shall be maintained in a legible condition so that the data can be easily read.

(d) Portable tanks shall be marked with the legend "COMBUSTIBLE LIQUID." Such legend shall be of letters not less than 3 inches high on a contrasting background and shall be displayed in a conspicuous location on the portable tank when combustible liquids or vapors

are carried therein. When commodities other than paraffinic hydrocarbons are carried, additional markings to indicate the exact material contained in the tank shall be provided.

(e) Pressure vessel type portable tanks designed in accordance with § 98.35–10, vented in accordance with § 98.35–13(c), and specifically approved for stowage below the weather deck in accordance with § 98.35–25(c), shall be marked with the legend "SUITABLE FOR STOWAGE BELOW DECKS." The lettering shall comply with the details of paragraph (d) of this section.

§ 98.35–20 Mounting, lifting and securing arrangements.

(a) *General.* Suitable base, lifting and securing arrangements to withstand service conditions shall be provided.

(b) *Securing devices.* Positive acting securing devices in sufficient number to immobilize the tank unit during any intended passage shall be provided. Due regard shall be given to the dynamic loads imposed by the motion of the vessel while in a seaway. The securing devices shall be sufficient in number and arranged in such a manner that no lashings other than those directly connected to hooks, lugs or padeyes will be necessary.

(c) *Mountings.* (1) Tanks shall be designed and fabricated with mountings to provide a secure base in transit. Skids, saddles, or similar devices shall be deemed to comply with this requirement.

(2) All tank mountings such as skids, fastenings, brackets, cradles, lifting lugs, etc., intended to carry loadings shall be permanently secured to tanks, and shall be designed to withstand static loadings in any direction equal to 1.5 times the weight of the tank and attachments when filled with the lading, using a safety factor of not less than four, based on the ultimate strength of the material to be used.

(3) Lifting lugs or hold-down lugs may be attached to either the tank or tank mountings. If lifting lugs and hold-down lugs are attached directly to the tank, they shall be attached to doubling plates welded to the tank and located at points of support; except that lifting lugs or hold-down lugs with integral bases serving as doubling plates may be welded directly to the tank.

(4) All tank mountings shall be designed so as to prevent the concentration of excessive loads on the tank shell.

§ 98.35–25 Location and stowage.

(a) Except as otherwise provided for in this section, portable tanks shall be stowed on the open weather deck. Portable tanks with open gooseneck vents shall not be located so that their vents, access manholes or other tank openings are within 10 feet of non-explosion proof equipment or openings to spaces containing non-explosion proof equipment.

(b) Tanks containing chemically incompatible cargoes shall be physically separated so that mixing of the cargoes could not occur as a result of a tank failure or an accident during cargo handling.

(c) Upon application to the Commandant, special consideration may be given for the stowage of portable tanks containing combustible liquids below the weather deck, provided the tanks are designed as pressure vessels suitable for a pressure of not less than 30 pounds per square inch and are vented in accordance with § 98.35–13(c).

(d) Combustible liquids transported in Interstate Commerce Commission's approved tank cars and tank trucks (for inflammable liquids) and specification ICC–51 portable tanks (complying with ICC requirements) are considered acceptable for stowage on the open weather deck. Combustible liquids transported in Interstate Commerce Commission's approved tank cars and tank trucks (for inflammable liquids) and specification ICC–51 portable tanks may be stowed below the weather deck, provided it is shown to the satisfaction of the Commandant that a degree of safety is obtained consistent with the minimum requirements of this subpart; and such containers shall meet the requirements of § 98.35–13 for venting and § 98.35–27 for outage.

(e) All tanks located below the weather deck shall be so stowed as to be readily accessible.

§ 98.35–27 Outage.

(a) Sufficient outage shall be provided to prevent the tank from being liquid full at any time, but in no case shall the outage be less than 5 percent for portable tanks intended for on deck stowage and not less than 8 percent for portable tanks intended for stowage below the weather deck.

§ 98.35–30 Firefighting equipment.

(a) The fire hose at each fire hydrant on the cargo vessel in the vicinity of the portable tanks shall be fitted with an approved combination spray nozzle. During loading and unloading operations, the pressure shall be maintained in the fire mains.

(b) The area of the deck in way of each 21,000 U.S. gallons or less of combustible liquids carried at any one time in the portable tanks also shall be protected by one or more approved B–V semiportable foam (40-gals. capacity) or dry chemical (50-lbs. minimum capacity for inside use, 100-lbs. minimum capacity for outside use) fire extinguishers; or alternatively, by a fire hose fitted with an approved portable mechanical foam nozzle with pickup tube and two 5-gallon cans of foam liquid concentrate. When carrying commodities incompatible with the conventional foam system, any foam used shall be of a type suitable for use with the lading. The fire extinguishers shall be located so that the entire area is protected without the need to move the extinguishers, and so as to be accessible in the event of fire occurring in the vicinity of the portable tanks.

§ 98.35–35 Special operating requirements.

(a) *Warning signals.* During transfer of cargo while fast to a dock, a red signal (flag by day and electric lantern at night) shall be so placed that it will be visible on all sides. While transferring cargo at anchor, a red flag only shall be displayed.

(b) *Warning sign at gangway.* A warning placard shall be displayed at each gangway in use while a vessel is fast to a dock during transfer of cargo, to warn persons approaching the gangway. The placards shall state in letters not less than 2 inches high substantially as follows:

WARNING

No open lights

No smoking

(c) *Smoking.* Smoking is prohibited in any open deck or cargo area which is within 50 feet of portable tanks.

(d) *Connecting cargo hose.* Sufficient length of hose shall be used to provide for movement of the vessel whenever a portable tank is filled or discharged while aboard the vessel. Gaskets shall be used in every hose joint and in couplings to pipelines where gasket type couplings are employed; and where bolted flanged joints are used, a sufficient number of bolts shall be used to secure a tight connection. Under no circumstances shall less than three bolts be used in a bolted flanged coupling. When cargo hose is supported by ship's tackle the senior deck officer on duty, or other person in charge when licensed officers are not required, shall see that sufficient tackles are used.

(e) *Inspection prior to transfer of cargo.* Prior to the transfer of cargo the senior deck officer on duty, or other person in charge where licensed officers are not required, shall inspect the vessel to assure himself that the following conditions exist:

(1) Warnings are displayed as required.

(2) No repair work in way of portable tanks is being carried on without his permission.

(3) Riveting, welding, burning or like fire-producing operations shall not be undertaken in the vicinity of portable tanks until an inspection has been made to determine that such operations can be undertaken with safety.

(4) Cargo hose is connected and cargo valves are set, whenever a portable tank is being loaded or discharged while aboard the vessel.

(5) The suitability of cargo handling or lifting gear when a loaded portable tank is being handled.

(f) *Approval to start transfer of cargo.* When the senior deck officer on duty, or other person in charge where licensed officers are not required, has assured himself that the above requirements have been met, he may give his approval to start cargo handling operations.

(g) *Duties of senior deck officer or person in charge.* The senior deck officer on duty, or other person in charge where licensed officers are not required, when a portable tank is loaded or discharged by hose while aboard the vessel, shall control the operations as follows:

(1) Supervise the operations of cargo system valves.

(2) Start transfer of cargo slowly.

(3) Observe hose and connections for leakage.

(4) Observe operating pressure on cargo system.

(5) Observe rate of loading for the purpose of avoiding overflow of tanks.

(h) *Conditions under which transfer operations shall not be commenced or if started shall be discontinued.* Cargo transfer operations shall not be started, or if started, shall be discontinued, under the following conditions:

(1) During severe electrical storms.

(2) If a fire occurs on the wharf or on the vessel or in the vicinity.

(i) *Termination of transfer operations.* When transfer operations involving the transfer of cargo by hose are completed, the cargo hose shall be drained of cargo.

(j) *Maintenance of cargo handling equipment.* The cargo handling equipment shall be maintained in good condition by the vessel's personnel. Cargo hose shall not be used in transfer operations in which the pressures are such that leakage of cargo occurs through the body of the hose.

(k) *Exemptions.* Combustible liquids having a flashpoint of 300° F. or above shall be exempt from the following paragraphs of this section:

(1) Paragraph (b) *Warning sign at gangway.*

(2) Paragraph (e) *Inspection prior to transfer of cargo.*

(3) Paragraph (f) *Approval to start transfer of cargo.*

§ 98.35–40 Electric bonding.

(a) A portable tank, if filled while aboard the vessel, shall be electrically connected to the shore piping, through which the cargo is to be transferred, prior to the connecting of a cargo hose. This electrical connection shall be maintained until after the cargo hose has been disconnected and any spillage has been removed.

§ 98.35–45 Initial tests.

(a) Before being placed in service, each portable tank shall be subjected to a hydrostatic test in the presence of a Coast Guard inspector.

(b) For gravity type cargo tanks, the test head pressure shall be not less than the design head pressure prescribed in § 98.35–10(b). For pressure vessel type cargo tanks, the hydrostatic test shall be made at a pressure not less than one and one-half times the design pressure of the tank or the safety relief valve setting, and shall otherwise be conducted in accordance with the testing and inspection requirements for unfired pressure vessels in Subchapter F (Marine Engineering) of this chapter.

(c) It shall be demonstrated by test of a prototype tank of a particular design prior to initial use, that such tank, when loaded at the maximum design weight and with the lifting arrangements provided, has a behavior when lifted which is stable and controllable. This demonstration test shall be made either in the presence of a Coast Guard inspector or by a testing agency acceptable to the Commandant for this purpose.

§ 98.35–50 Periodic tests and inspections.

(a) At least once every 4 years each portable tank shall be subjected to a hydrostatic test to the test pressure as shown on the nameplate, which shall be made in the presence of a Coast Guard inspector. At such time, the tank shall also be internally examined.

(b) No repairs or alterations affecting the safety of the portable tank shall be made without the prior knowledge of the Officer in Charge, Marine Inspection. Notice shall be in accordance with § 91.-45–1 of this subchapter. An inspection either general or partial depending upon the circumstances shall be made whenever any important repairs or alterations are undertaken. The Officer in in Charge, Marine Inspection, may subject the portable tank to the periodic tests as prescribed in paragraph (a) of this section prior to placing such tank back into service.

SUBCHAPTER J—ELECTRICAL ENGINEERING

PART 110—GENERAL PROVISIONS

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110.15–155 Propulsion engine.
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110.15–165 Rivers.
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Subpart 110.20—Equivalents

110.20–1 Conditions under which equivalents may be used.

Subpart 110.25—Special Provisions

110.25–1 Vessels acquired or documented under the Act of August 9, 1954.
110.25–5 Installations of equipment made during the Unlimited National Emergency declared by the President on May 27, 1941.

AUTHORITY: The provisions of this Part 110 issued under R.S. 4405, as amended, 4462, as amended; 46 U.S.C. 375, 416. Interpret or apply R.S. 4399, as amended, 4400, as amended, 4417, as amended, 4417a, as amended, 4418, as amended, 4421, as amended, 4426, as amended, 4427, as amended, 4433, as amended, 4453, as amended, 4488, as amended, 4491, as amended, sec. 14, 29 Stat. 690, as amended, sec. 10, 35 Stat. 428, as amended, 41 Stat. 305, as amended, sec. 5, 49 Stat. 1384, as amended, secs. 1, 2, 49 Stat. 1544, 1545, as amended, sec. 17, 54 Stat. 166, as amended, sec. 3, 54 Stat. 347, as amended, sec. 3, 70 Stat. 152, sec. 3, 68 Stat. 675; 46 U.S.C. 361, 362, 391, 391a, 392, 399, 404, 405, 411, 435, 481, 489, 366, 395, 363, 369, 367, 526p, 1333, 390b, 50 U.S.C. 198; E.O. 11239, July 31, 1965, 30 F.R. 9671, 3 CFR, 1965 Supp. Treasury Department Orders 120, July 31, 1950, 15 F.R. 6521; 167–14, Nov. 26, 1954, 19 F.R. 8026; 167–20, June 18, 1956, 21 F.R. 4894; CGFR 56–28, July 24, 1956, 21 F.R. 5659; 167–33, Oct. 26, 1959, 24 F.R. 8857.

Subpart 110.01—Basis and Purpose of Regulations

§ 110.01–1 Purpose of regulations.

(a) The purpose of the regulations in this subchapter is to set forth uniform minimum requirements for electrical apparatus and equipment when installed on various types of vessels in accordance with the intent of Title 52 of the Revised Statutes and acts amendatory thereof or supplemental thereto, as well as to implement various international conventions for safety of life at sea and other treaties which contain requirements regarding electrical apparatus or equipment. The regulations are necessary to implement the various provisions of law promulgated for the purpose of improving or promoting safety of life at sea.

§ 110.01–5 Assignment of functions.

(a) By Reorganization Plan No. 3 of 1946, effective July 16, 1946, the marine inspection functions of the former Bureau of Marine Inspection and Navigation and its officers and employees were transferred to the Commandant, United States Coast Guard. By Reorganization Plan No. 26 of 1950, effective July 31,

1950 (15 F. R. 4935, 5 U. S. C. note under 241), the functions formerly vested in the Commandant, United States Coast Guard, were transferred to the Secretary of the Treasury with certain specified exceptions. The Secretary of the Treasury by an order dated July 31, 1950 (15 F. R. 6521), delegated to the Commandant functions formerly performed by him under Reorganization Plan No. 3 of 1946.

§ 110.01–10 Authority for regulations.

(a) *General.* (1) The authority to prescribe regulations generally is set forth in R. S. 4405 and 4462, as amended (46 U. S. C. 375 and 416), as well as in other provisions of Title 52 of the Revised Statutes and acts amendatory thereof or supplemental thereto. Under the provisions of R. S. 4403, as amended (46 U. S. C. 372), the Commandant, United States Coast Guard, superintends the administration of the vessel inspection laws and is required to produce a correct and uniform administration of the inspection laws, rules, and regulations.

(b) *Tank vessels.* The regulations regarding electrical apparatus and equipment which may be used on tank vessels interpret or apply R. S. 4417a and sec. 3 (c) of Public Law 569, 83d Cong., 68 Stat. 676 (46 U. S. C. 391a, 50 U. S. C. 198), as well as Executive Order 11239, 30 F.R. 9671, 3 CFR, 1965 Supp.

(c) *Passenger vessels.* (1) The regulations regarding electrical apparatus and equipment which may be used on passenger vessels interpret or apply R. S. 4399, 4400, 4417, 4418, 4421, 4426, 4433, 4453, and 4488, as amended, section 14, 29 Stat. 690, section 10, 35 Stat. 428, 41 Stat. 305, 49 Stat. 1384, 1544, section 3, 54 Stat. 346, and sec. 3(c), Public Law 569, 83d Cong., 68 Stat. 676 (46 U.S.C. 361, 362, 391, 392, 399, 404, 411, 435, 481, 366, 395, 363, 369, 367, 1333, 50 U.S.C. 198), as well as Executive Order 11239, 30 F.R. 9671, 3 CFR, 1965 Supp.

(d) *Cargo and miscellaneous vessels.* (1) The regulations regarding electrical apparatus and equipment which may be installed on cargo and miscellaneous vessels interpret or apply R. S. 4399, 4400, 4417, 4418, 4421, 4426, 4427, 4433, 4453, and 4488, as amended, section 14, 29 Stat. 690, section 10, 35 Stat. 428, 41 Stat. 305, 49 Stat. 1544, and sec. 3 (c), Public Law 569, 83d Cong., 68 Stat. 676 (46 U. S. C. 361, 362, 391, 392, 399, 404, 405, 411, 435, 481, 366, 395, 363, 367, 50 U.S.C. 198), as well as Executive Order 11239, 30 F.R. 9671, 3 CFR, 1965 Supp.

(e) *Uninspected vessels.* (1) The regulations regarding electrical apparatus and equipment which may be installed on uninspected vessels interpret or apply section 17, 54 Stat. 166, as amended (46 U. S. C. 526p).

(f) *Exemptions.* (1) Public vessels owned by the United States, other than those engaged in commercial service, are to be exempt from the regulations in this subchapter. Certain other vessels may be exempt from the requirements of the regulations in this subchapter when so provided by law.

Subpart 110.05—Application

§ 110.05–1 Vessels subject to the requirements of this subchapter.

(a) This subchapter shall be applicable to all vessels as indicated in columns 3, 4, and 5 of Table 110.05–1(a) and shall apply to all such United States flag vessels, and to all foreign vessels which carry passengers from any port in the United States to the extent prescribed by law, except as follows:

(1) Any vessel of a foreign nation signatory to the International Convention for Safety of Life at Sea, 1960, and which has on board a current, valid safety certificate.

(2) Any vessel of a foreign nation having inspection laws approximating those of the United States together with reciprocal inspection arrangements with the United States, and which has on board a current, valid certificate of inspection issued by its government under such arrangements.

(3) Any vessel operating exclusively on inland waters which are not navigable waters of the United States.

(4) Any vessel laid up and dismantled and out of commission.

(5) With the exception of vessels of the U. S. Maritime Administration, any vessel with the title vested in the United States and which is used for public purposes.

TABLE 110.05-1(a)

Method of propulsion	Size or other limitations [1]	Classes of vessels (including motorboats) examined or inspected under various Coast Guard regulations [1]			
		Vessels inspected and certificated under Subchapter D—Tank Vessels [2]	Vessels inspected and certificated under either Subchapter H—Passenger Vessels [2 3 4] or Subchapter T—Small Passenger Vessels [2 3 4]	Vessels inspected and certificated under Subchapter I—Cargo and Miscellaneous Vessels [2 3]	Vessels subject to provisions of Subchapter C—Uninspected Vessels [2 3 4]
Column 1	Column 2	Column 3	Column 4	Column 5	Column 6
Steam	Vessels not over 65 feet in length.	All vessels carrying combustible or flammable liquid cargo in bulk.	All vessels carrying more than 6 passengers.[7]	All tugboats and towboats.	All vessels except those covered by columns 3, 4, and 5.[8]
	Vessels over 65 feet in length.	All vessels carrying combustible or flammable liquid cargo in bulk.[8]	1. All vessels carrying more than 12 passengers on an international voyage, except yachts. 2. All vessels of not over 15 gross tons which carry more than 6 passengers.[7] 3. All other vessels carrying passengers, except: a. Yachts. b. Documented cargo or tank vessels issued a permit to carry not more than 16 persons in addition to the crew. c. Towing and fishing vessels, in other than ocean and coastwise service, may carry persons on the legitimate business of the vessel, in addition to crew, but not to exceed one for each net ton of the vessel.	All vessels except those covered by columns 3 and 4.	None.
Motor	Vessels of not over 15 gross tons.	All vessels carrying combustible or flammable liquid cargo in bulk.	All vessels carrying more than 6 passengers.[7]	Those vessels carrying dangerous cargoes when required by 46 CFR Part 98 or 146.	All vessels except those covered by columns 3, 4, and 5.
	Vessels over 15 gross tons except seagoing motor vessels of 300 gross tons and over.	All vessels carrying combustible or flammable liquid cargo in bulk.[8]	1. All vessels carrying more than 12 passengers on an international voyage, except yachts. 2. All vessels not over 65 feet in length which carry more than 6 passengers.[7] 3. All other vessels of over 65 feet in length carrying passengers for hire except documented cargo or tank vessels issued a permit to carry not more than 16 persons in addition to the crew.	All vessels carrying freight for hire except those covered by columns 3 and 4.	All vessels except those covered by columns 3, 4, and 5.

See footnotes at end of table.

TABLE 110.05-1(a)—Continued

Method of propulsion	Size or other limitations [1]	Classes of vessels (including motorboats) examined or inspected under various Coast Guard regulations [1]			
		Vessels inspected and certificated under Subchapter D-Tank Vessels [2]	Vessels inspected and certificated under either Subchapter H—Passenger Vessels [3 4 6] or Subchapter T—Small Passenger Vessels [3 8]	Vessels inspected and certificated under Subchapter I—Cargo and Miscellaneous Vessels [3 6]	Vessels subject to provisions of Subchapter C—Uninspected Vessels [3 8]
Column 1	Column 2	Column 3	Column 4	Column 5	Column 6
	Seagoing motor vessels of 300 gross tons and over.	All vessels carrying combustible or flammable liquid cargo in bulk.[4]	1. All vessels carrying more than 12 passengers on an international voyage, except yachts. 2. All other vessels carrying passengers, except: a. Yachts. b. Documented cargo or tank vessels issued a permit to carry not more than 16 persons in addition to the crew.	All vessels except those covered by columns 3 and 4, and those engaged in the fishing, oystering, clamming, crabbing, or any other branch of the fishery, kelp, or sponge industry.	All vessels except those covered by columns 3, 4, and 5.
Sail	Vessels not over 700 gross tons.	All vessels carrying combustible or flammable liquid cargo in bulk.	All vessels carrying more than 6 passengers.[7]	Those vessels carrying dangerous cargoes when required by 46 CFR Part 98 or 146.	None.
	Vessels over 700 gross tons.	All vessels carrying combustible or flammable liquid cargo in bulk.	All vessels carrying passengers for hire.	Those vessels carrying dangerous cargoes when required by 46 CFR Part 98 or 146.	None.
Nonself-propelled	Vessels not over 100 gross tons.	All vessels carrying combustible or flammable liquid cargo in bulk.	All vessels carrying more than 6 passengers.[7]	Those vessels carrying dangerous cargoes when required by 46 CFR Part 98 or 146.	All barges carrying passengers except those covered by column 4.
	Vessels over 100 gross tons.	All vessels carrying combustible or flammable liquid cargo in bulk.	All vessels carrying passengers for hire.	All seagoing barges except those covered by columns 3 and 4; and those inland barges carrying dangerous cargoes when required by 46 CFR Part 98 or 146.	All barges carrying passengers except those covered by column 4.

[1] Where length is used in this table it means the length measured from end to end over the deck, excluding sheer. This expression "means a straight line measurement of the overall length from the foremost part of the vessel to the aftermost part of the vessel, measured parallel to the centerline."

[2] Subchapters E (Load Lines), F (Marine Engineering), J (Electrical Engineering), and N (Dangerous Cargoes) of this chapter may also be applicable under certain conditions.

[3] Public nautical schoolships, other than vessels of the Navy and Coast Guard, shall meet the requirements of Part 167 of Subchapter R (Nautical Schools) of this chapter. Civilian nautical schoolships, as defined by 46 U.S.C. 1331, shall meet the requirements of Subchapter H (Passenger Vessels) and Part 168 of Subchapter R (Nautical Schools) of this chapter.

[4] Subchapter H (Passenger Vessels) of this chapter covers only those vessels of 100 gross tons or more. Subchapter T (Small Passenger Vessels) of this chapter covers only those vessels of less than 100 gross tons.

[5] Vessels covered by Subchapters H (Passenger Vessels) or I (Cargo and Miscellaneous Vessels) of this chapter, where the principal purpose or use of the vessel is not for the carriage of liquid cargo, may be granted a permit to carry a limited amount of flammable or combustible liquid cargo in bulk. The portion of the vessel used for the carriage of the flammable or combustible liquid cargo shall meet the requirements of Subchapter D (Tank Vessels) in addition to the requirements of Subchapter H (Passenger Vessels) or I (Cargo and Miscellaneous Vessels) of this chapter.

[6] Any vessel on an international voyage is subject to the requirements of the International Convention for Safety of Life at Sea, 1960.

[7] The meaning of the term "passenger" is as defined in the Act of May 10, 1956 (sec. 1, 70 Stat. 151; 46 U.S.C. 390).

[8] Boilers and machinery are subject to examination on vessels over 40 feet in length.

§ 110.05-3 Amendments to the regulations.

(a) The regulations in this subchapter are not retroactive in effect unless specifically provided for in the regulation at the time it is amended or added.

(b) The regulations amended or added subsequent to November 19, 1952, are applicable to installations contracted for on or after the effective date of such regulations.

§ 110.05-5 Specific application noted in text.

At the beginning of the various parts, subparts, and sections, a more specific application is generally given for particular portions of the text involved. This application sets forth the types, sizes or services of vessels to which the text pertains, and in many cases limits the application of the text to vessels contracted for before or after a specific date. As used in this subchapter, the term "vessel contracted for" includes not only the contracting for the construction of a vessel, but also the contracting for a material alteration to a vessel, the contracting for the conversion of a vessel to a passenger vessel, and the changing of service or route of a vessel if such change increases or modifies the general requirements for the vessel or increases the hazards to which it might be subject.

Subpart 110.10—Reference Specifications, Standards, and Codes

§ 110.10-1 General.

The following specifications, standards, and codes, to the extent specified in the text, form a part of this subchapter:

(a) Rules for the Classification and Construction of Steel Vessels, of issue in effect on the date the vessel is contracted for, issued by American Bureau of Shipping, 45 Broad Street, New York, N.Y., 10004.

(b) Publications of issue in effect on the date the vessel is contracted for, issued by National Fire Protection Association, 60 Batterymarch Street, Boston, Mass., 02110, as listed in this paragraph.

(1) The National Electrical Code.

(2) Code for Use of Flammable Anesthetics (Safe Practice for Hospital Operating Rooms).

(c) Standards of issue in effect on the date the vessel is contracted for, issued by National Electrical Manufacturers Association, 155 East 44th Street, New York, N.Y., 10017, as listed in this paragraph.

(1) NEMA Standards Publication Molded Case Circuit Breakers.

(2) NEMA Standards for Large Air Circuit Breakers.

(3) NEMA Standards Publication Motors and Generators (MG1).

(d) Standards of issue in effect on the date the vessel is contracted for, issued by the Institute of Electrical and Electronic Engineers, Box A, Lenox Hill Station, New York, N.Y., 14481, as listed in this paragraph.

(1) AIEE Standard No. 45—Recommended Practice for Electrical Installations on Shipboard.

(2) American Standard Definitions of Electrical Terms, ASA C42.

(e) Standards issued by Underwriters' Laboratories, Inc., 207 East Ohio Street, Chicago, Ill., 60011, as listed in this paragraph, each of issue in effect on the date the vessel is contracted for:

(1) Standard for Snap Switches.

(2) Standard for Knife Switches.

(3) Standard for Fuses.

(4) Standard for Industrial Control Equipment.

(5) Standard for Branch-Circuit and Service Circuit Breakers.

(6) Standard for Panelboards.

(7) Standard for Edison-Base Lampholders.

(8) Standard for Marine Type Electric Lighting Fixtures.

(9) Standard for Attachment Plugs and Receptacles.

(10) Standard for Flexible Cord and Fixture Wire.

(11) Standard for Electric-Discharge-Lamp Accessory Equipment.

(12) Standard for Elevator Electric Contacts and Elevator Hoistway Door Interlocks.
(13) Standard for Portable Electric Lamps.
(14) Standard for Wire Connectors and Soldering Lugs.
(15) Standard for Outlet Boxes and Fittings.
(16) Standard for Enclosed Switches.
(17) Standard for Commercial Electric Cooking Appliances.

(f) Specifications and Guides issued by the U.S. Navy Bureau of Ships, Washington, D.C., 20360, of issue in effect on the date the vessel is contracted for, as listed in this paragraph.

(1) MIL–C–915 Interim Specifications Cable, Cord and Wire, Electrical (shipboard use).
(2) MIL–C–2194 Military Specifications Cable, Power, Electrical, Reduced Diameter Type, Naval Shipboard.
(3) MIL–C–23206 Military Specifications Cable, Special Purpose, Electrical (Nuclear Plant).
(4) NavShips 250–660–23, Cable Comparison Guide.

(g) Standards of issue in effect on the date the vessel is contracted for, issued by American Standards Association, 70 East 45th Street, New York, N.Y., 10017.

(1) Safety Code for Elevators, Dumbwaiters, and Escalators.

§ 110.10–5 Copies of specifications, standards and codes.

(a) Copies of the specifications, standards, and codes referred to in this subpart may be obtained from the issuing authority except:

(1) Military specifications may be obtained from the Commanding Officer, Naval Supply Depot, 5801 Tabor Avenue, Philadelphia, Pa., 19120.

(2) NavShips 250–660–23 may be purchased from the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402.

(b) Copies of the specifications, standards, and codes referred to in this subpart are available for reading purposes at Coast Guard Headquarters upon request.

Subpart 110.15—Definition of Terms Used in This Subchapter

§ 110.15–1 Approved.

This term means approved by the Commandant, United States Coast Guard, unless otherwise stated.

§ 110.15–5 Boat deck.

This term means the deck or decks on which lifeboats are stowed.

§ 110.15–10 Bulkhead deck.

This term means the uppermost deck up to which the transverse watertight bulkheads are carried.

§ 110.15–15 Cable terms.

(a) *Cable.* (1) A cable is either a stranded conductor with or without insulation and other coverings (single conductor cable), or a combination of conductors insulated from one another (multiple-conductor cable).

(b) *Cable designations.* (1) Abbreviations given in Columns 1 to 5, inclusive, of Table 110.10–15 (b) (1) may be employed in connection with lighting and power, interior communication, and telephone cable. Thus, in the abbreviation DRL–4, D=double conductor, light and power (column 1), R=rubber insulated (column 2), L=leaded and steel armored (columns 3 and 4), and—4=No. 14 American wire gage, 4110 circular mils (column 5). In the abbreviation ICTIA–12, IC=interior communication (column 1), T=thermoplastic-asbestos or thermoplastic-glass-asbestos insulated (column 2), I=impervious sheathed (column 3), A=Aluminum armored (column 4), and —12=12 conductor (column 5).

(2) The trade designations given in Table 110.15–15 (b) (2) may be used to designate the type of flexible cord and fixture wire.

TABLE 110.15–15(b)(1)—LIGHTING AND POWER, INTERIOR COMMUNICATION, AND TELEPHONE CABLE SYMBOLS

Column 1 Symbol designating cable type	Column 2 Symbol designating type of insulation	Column 3 Symbol designating type of outer covering	Column 4 Symbol designating type of armor	Column 5 Symbol designating wire size for light and power cable or number of conductors for interior communication or number of pairs of conductors for telephone cable
S=single conductor, light and power. D=double conductor, light and power. T=triple conductor, light and power. F=four conductor, light and power. IC=interior communication. TT=twisted pair, telephone. TTC=twisted pair, inter-cabin telephone.	R=rubber. V=varnished-cambric. AV=asbestos-varnished-cambric. T=thermoplastic-asbestos or thermoplastic-glass-asbestos. MI=mineral insulated.	A=armored only. L=leaded and armored. I=impervious sheathed and armored. S=reinforced sheathed and armored.	None=steel. A=aluminum. B=bronze.	Circular mil size in thousands, or number of conductors, or number of pairs of conductors.

TABLE 110.15–15 (b) (2)—PORTABLE CORD AND FIXTURE WIRE SYMBOLS

Trade name of wire or cord	Designation	Trade name of wire or cord	Designation
Asbestos-covered heat-resistant fixture wire	AF	Rubber-jacketed heater cord	HSJ
Silicone rubber insulated fixture wire	SF-2	Braided heavy duty cord	K
Silicone rubber insulated fixture wire, flexible stranding	SFF-2	Reinforced cord	P, P-2
Asbestos-covered heat-resistant cord	AFC, AFPD	Twisted portable cord	PD
Rubber-jacketed heat-resistant cord	AFS, AFSJ	Moisture-proof reinforced cord	PW, PW-2
Heat- and moisture-resistant cord	AVPD	Rubber-covered stranded fixture wire	RF-2
Lamp cord	C	Heat-resistant rubber-covered stranded fixture wire	RFH-2
Cotton-covered heat-resistant fixture wire, stranded or flexible stranded	CF	Hard service cord	S
Cotton-covered heat-resistant cord	CFC, CFPD	Hard service cord, oil-resistant	SO
Elevator cable	E, EO, ET	Hard service cord thermoplastic covered	ST
Rubber-covered fixture wire, flexible stranding	FF-2	Junior hard service cord	SJ
Heat-resistant rubber-covered fixture wire, flexible stranding	FFH-2	Junior hard service cord, oil-resistant	SJO
Heater cord	HC, HPD	Junior hard service cord, thermoplastic covered	SJT
Jacketed heater cord	HS	Thermoplastic-covered stranded fixture wire	TF
		Thermoplastic-covered fixture wire, flexible stranding	TFF

§ 110.15–20 Coast Guard District Commander.

This term means an officer of the Coast Guard designated as such by the Commandant to command all Coast Guard activities within his district, which includes the inspection, enforcement, and administration of Title 52, Revised Statutes, and Acts amendatory thereof or supplemental thereto, and rules and regulations thereunder.

§ 110.15–25 Coastwise.

Under this designation shall be included all vessels normally navigating the waters of any ocean or the Gulf of Mexico 20 nautical miles or less offshore.

§ 110.15–30 Commandant.

This term means the Commandant of the Coast Guard.

§ 110.15–35 Control equipment terms.

(a) *Electric controllers.* An electric controller is a device, or group of devices, which serves to govern, in some predetermined manner, the electric power delivered to the apparatus to which it is connected.

(b) *Basic functions.* The basis functions of a controller are the functions of those of its elements which govern the application of electric power to the connected apparatus.

(c) *Manual controller.* A manual controller is an electric controller having all of its basic functions performed by devices which are operated by hand.

(d) *Full magnetic controller.* A full magnetic controller is an electric controller having all of its basic functions performed by devices which are operated by electromagnets.

(e) *Contactor.* A contactor is a device for repeatedly establishing and interrupting an electric power circuit.

(f) *Starter.* A starter is an electric controller for accelerating a motor from rest to normal speed, and to stop the motor.

(g) *Automatic starter.* An automatic starter is a starter in which the influence directing its performance is automatic.

(h) *Autotransformer starter.* An autotransformer starter is a starter which includes an autotransformer to furnish reduced voltage for starting of an alternating current motor. It includes the necessary switching mechanism, and it is frequently called a compensator or autostarter.

(i) *Overload protection (overcurrent protection).* Overload protection is the effect of a device operative on excessive current, but not necessarily on short circuit, to cause and maintain the interruption of current flow to the device governed.

(j) *Overload relay.* An overload relay is an overcurrent relay which functions at a predetermined value of overcurrent to cause disconnection of the load from the power supply.

NOTE: An overload relay is intended to protect the load (for example, motor armature) or its controller, and does not necessarily protect itself.

(k) *Normally open and normally closed.* The terms "Normally Open" and "Normally Closed" when applied to a magnetically operated switching device, such as a contactor or relay, or to the contacts thereof, signify the position taken when the operating magnet is deenergized. These terms apply only to nonlatching types of devices.

(l) *Temperature compensated overload relay.* A temperature compensated overload relay is an overload relay which functions at any current in excess of a predetermined value essentially independent of ambient temperature.

§ 110.15–40 Corrosion-resistant finishes.

The following treatments listed in this section, when properly done and of sufficiently heavy coating, are considered satisfactory corrosion-resistant finishes:

(a) Electroplating of cadmium, chromium, nickel, silver, or zinc.

(b) Sheradizing.

(c) Galvanizing.

(d) Painting. Thorough cleaning and degreasing, followed by bonderizing or the equivalent, followed by the application of zinc chromate primer or the equivalent, followed by one or more applications of enamel.

§ 110.15–45 Corrosion-resistant or noncorrodible materials.

Silver, corrosion-resisting steel, copper, brass, bronze, copper-nickel, certain copper-nickel alloys, and certain aluminum alloys are considered satisfactory corrosion-resistant or noncorrodible materials.

§ 110.15–50 Electrochemistry.

(a) *Storage battery.* A storage battery is a connected group of two or more electrolytic cells for the generation of electric energy in which the cells after being discharged may be restored to a charged condition by an electric current flowing in a direction opposite to the flow of current when the cell discharges.

(b) *Dry cell.* A dry cell is a cell in which the electrolyte is immobilized.

(c) *Primary cell.* A primary cell is a cell which produces electric current by electrochemical reactions without regard to the reversibility of those reactions. (Some primary cells are reversible to a limited extent.)

§ 110.15–55 Embarkation deck.

This term means the deck or decks from which passengers embark into lifeboats or the deck or decks on which passenger as assembled preparatory to embarking into lifeboats.

§ 110.15–60 Emergency squad.

This term means that part of the crew designated by the station bill to form the nucleus of a damage control party.

§ 110.15–65 Equipment enclosure terms.

(a) *Enclosed (inclosed).* Enclosed means surrounded by a case which will prevent a person from accidentally contacting live parts.

(b) *Nonwatertight equipment.* Nonwatertight equipment means enclosed equipment, the enclosure of which is not sufficiently effective to be classed as either drip-proof or watertight.

(c) *Drip-proof equipment.* Drip-proof equipment means enclosed equipment so constructed or protected that its successful operation is not interfered with when subjected to falling moisture or dirt.

(d) *Watertight equipment.* Watertight equipment means enclosed equipment so constructed that a stream of water from a hose (not less than 1 inch in diameter) under a head of about 35 feet from a distance of about 10 feet, and for a period of 5 minutes, can be played on the apparatus without leakage. The hose nozzle should be adjusted to give a solid stream at the enclosure.

(e) *Explosion-proof equipment.* Explosion-proof equipment means equipment enclosed in a case which is capable of withstanding an explosion of a specified gas or vapor which may occur within it, and of preventing the ignition of the specified gas or vapor surrounding the enclosure by sparks, flashes or explosions of the gas or vapor within.

(f) *Weathertight equipment.* Weathertight equipment means equipment so constructed or protected that exposure to a beating rain will not result in the entrance of water.

(g) *Totally enclosed equipment.* Totally enclosed means so enclosed as to prevent circulation of air between the inside and the outside of the case, but not necessarily sufficiently to be termed airtight.

§ 110.15–70 Equivalent.

This term, when used in connection with a unit, material, process, finish, etc., means the equivalent as determined by the Coast Guard.

§ 110.15–75 Ferry.

Under this designation shall be included those vessels in other than ocean or coastwise service having provisions only for deck passengers and/or vehicles, operating on a short run on a frequent schedule between two points over the most direct water route, and offering a public service of a type normally attributed to a bridge or tunnel.

§ 110.15–80 Flashpoint.

This term indicates the temperature in degrees Fahrenheit at which a liquid gives off a flammable vapor when heated in an open-cup tester.

§ 110.15–85 Generation and distribution terms.

(a) *Connected load.* The connected load is the sum of the continuous ratings of the load consuming apparatus connected to the system or any part thereof.

(b) *Load factor.* Load factor is the ratio of the average load over a designated period of time to the connected load.

(c) *Peak load.* Peak load is the maximum load consumed or produced by a unit or group of units in a stated period of time. It may be the maximum instantaneous load or the maximum average load over a designated interval of time.

NOTE: Maximum average load is ordinarily used. In commercial transactions involving peak load (peak power) it is taken as the average load (power) during a time interval of specified duration occurring within a given period of time, that time interval being selected during which the average power is greatest.

(d) *Ground (earth).* A ground is a conducting connection, whether intentional or accidental, by which an electric circuit or equipment is connected to the earth, or to some conducting body, of relatively large extent, which serves in place of the earth. It is used for establishing and maintaining the potential of the earth (or of the conducting body) or approximately that potential, on conductors connected to it, and for conducting ground current to and from the earth (or the conducting body).

NOTE: On shipboard the "ground" or "earth" is the metal hull and all conductive parts connected thereto.

(e) *Grounded (earthed).* Grounded means that the system, circuit, or apparatus referred to is produced with a ground.

(f) *Ground-return circuit (earth-return circuit).* A ground-return circuit in which the earth is utilized to complete the circuit.

(g) *Ground current.* Ground current is current flowing in the earth or in a grounding connection.

(h) *Voltage to ground.* The voltage to ground is the voltage between any live conductor of a circuit and the earth.

NOTE: Where safety considerations are involved, the voltage to ground which may occur in an ungrounded circuit is usually the highest voltage normally existing between the conductors of the circuit, but in special circumstances higher voltages may occur.

(i) *Ground indication.* A ground indication is an indication of the presence of a ground on one or more of the normally ungrounded conductors of a system.

(j) *Circuit.* A circuit is a conducting part or a system of conducting parts through which an electric current is intended to flow.

(k) *Feeder (in interior wiring).* A feeder is a set of conductors originating at a main distribution center, and supplying one or more secondary distribution centers, one or more branch-circuit distribution centers, or any combination of these two types of equipment.

(l) *Lighting feeder.* A lighting feeder is a feeder supplying principally a lighting load.

(m) *Power feeder.* A power feeder is a feeder supplying principally a power or heating load.

(n) *Branch circuit.* A branch circuit is that portion of a wiring system extending beyond the final overcurrent device protecting the circuit.

(o) *Motor branch circuit.* A motor branch circuit is a branch circuit supplying energy only to one or more motors and associated motor controllers.

(p) *Lighting branch circuit.* A lighting branch circuit is a circuit supplying energy to lighting outlets only. (Lighting branch circuits also may supply portable desk or bracket fans, small heating appliances, motors of ¼ hp and less, and other portable apparatus of not over 660 watts each.)

(q) *Appliance branch circuit.* An appliance branch circuit is a circuit supplying energy to one or more outlets to which appliances are to be connected; such circuits to have no permanently-connected lighting fixtures not a part of an appliance.

(r) *Outlet.* An outlet is a point on the wiring system at which current is taken to supply fixtures, lamps, heaters, motors, or current-consuming equipment generally.

NOTE: The use of the term outlet for a point in the wiring system where a switch is located is deprecated, unless qualified to make the meaning clear.

(s) *Lighting outlet.* A lighting outlet is an outlet intended for the direct connection of a lampholder, a lighting fixture or a pendant cord terminating in a lampholder.

(t) *Receptacle outlet.* A receptacle outlet is an outlet intended to be equipped with one or more receptacles, not of the screw-shell type, or provided with one or more points of attachment within one foot, intended to receive attachment plugs.

(u) *Plug (plug adaptor).* An attachment plug is a device which, by insertion in a receptacle, establishes connection between the conductors of the attached flexible cord and the conductors connected permanently to the receptacle.

(v) *Appliance.* Appliances are current-consuming equipment, fixed or portable; for example, heating, cooking and small motor-operated equipment.

(w) *Portable appliance.* A portable appliance is an appliance, fixed or portable, served by means of a flexible extension cord and/or attachment plug.

(x) *Accessible (as applied to wiring methods).* Accessible means not permanently closed in by the structure or finish of the ship; capable of being removed without disturbing the ship structure or finish.

(y) *Accessible (as applied to equipment).* Accessible means admitting close approach because not guarded by locked doors, elevation or other effective means.

§ 110.15–90 Great Lakes.

Under this designation shall be included all vessels navigating the Great Lakes.

§ 110.15–95 Headquarters.

This term means the office of the Commandant, U.S. Coast Guard, Washington, D.C., 20226.

§ 110.15–100 Instrument and meter terms.

(a) *Instrument.* An instrument is a device for measuring the value of the quantity under observation. An instrument may be an indicating instrument or a recording instrument. The term "instrument" is used in two different senses: (1) Instrument proper consisting of the mechanism and the parts built into the case or made a corporate part thereof, and (2) the instrument proper together with any necessary auxiliary devices, such as shunt, shunt leads, resistors, reactors, capacitors or instrument transformers. The term "meter" is also used in a general sense to designate any type of measuring device, including all types of electric measuring instruments. Such use as a suffix or as part of a compound word (e.g., voltmeter, frequency meter) is universally accepted. Meter may be used alone with this wider meaning when the context is such as to prevent confusion with the narrower meaning of electricity meter.

(b) *Indicating instrument.* An indicating instrument is an instrument in which only the present value of the quantity measured is visually indicated.

(c) *Ammeter.* An ammeter is an instrument for measuring the magnitude of an electric current. It is provided with a scale, usually graduated in either amperes, milliamperes, microamperes or kiloamperes. If the scale is graduated in milliamperes, microamperes or kiloamperes, the instrument is usually designated as a milliammeter, a microammeter or a kiloammeter.

(d) *Frequency meter.* A frequency meter is an instrument for measuring the frequency of an alternating current.

(e) *Power-factor meter.* A power-factor meter is a direct-reading instrument for measuring power factor. It is provided with a scale graduated in power factor.

(f) *Voltmeter.* A voltmeter is an instrument for measuring the magnitude of electric potential difference. It is provided with a scale, usually graduated in either volts, millivolts, or kilovolts. If the scale is graduated in millivolts or kilovolts the instrument is usually designated as a millivoltmeter or a kilovoltmeter.

(g) *Wattmeter.* A wattmeter is an instrument for measuring the magnitude of the active power in an electric circuit. It is provided with a scale usually graduated in either watts, kilowatts, or megawatts. If the scale is graduated in kilowatts or megawatts, the instrument is usually designated as a kilowattmeter or megawattmeter.

(h) *Instrument shunt.* An instrument shunt is a particular type of resistor designed to be connected in parallel with a circuit of an instrument to extend its current range. The shunt may be internal or external to the instrument proper.

§ 110.15–105 International voyage.

(a) The term "international voyage," as used in this subchapter, shall have the same meaning as that contained in Regulation 2(d), Chapter I, of the International Convention for Safety of Life at Sea, 1960; i.e., " 'International voyage' means a voyage from a country to which the present Convention applies to a port outside such country, or conversely; and for this purpose every territory for the international relations of which a Contracting Government is responsible or for which the United Nations is the administering authority is regarded as a separate country."

(b) The International Convention for Safety of Life at Sea, 1960, does not apply to vessels "solely navigating the Great Lakes of North America and the River St. Lawrence as far east as a straight line drawn from Cap de Rosiers to West Point, Anticosti Island and, on the north side of Anticosti Island, the 63d Meridian." Accordingly, such vessels shall not be considered as being on an "international voyage" for the purpose of this subchapter.

(c) For the purpose of this subchapter the term "territory" as used in paragraph (a) of this section shall be considered to include the Commonwealth of Puerto Rico, the Canal Zone, all possessions of the United States, and all lands held by the United States under a protectorate or mandate.

(d) Although voyages between the continental United States and Hawaii or Alaska, and voyages between Hawaii and Alaska are not "international voyages" under the provisions of the International Convention for Safety of Life at Sea, 1960, such voyages are similar in nature and shall be considered as "international voyages" and subject to the same requirements for the purpose of this subchapter.

§ 110.15–110 Lakes, bays, and sounds.

Under this designation shall be included all vessels navigating the waters of any of the lakes, bays, or sounds other than the waters of the Great Lakes.

§ 110.15–115 Locations.

(a) *Corrosive location.* Corrosive locations shall be deemed to be locations exposed to the weather on vessels operating in salt water.

(b) *Damp or wet location.* Damp or wet locations shall be deemed to be locations exposed to the weather, machinery

spaces, cargo spaces, refrigerated spaces, galley, laundry, public washrooms or toilets equipped with baths or showers, and similar locations. Areas directly inside of access doors to a weather deck will also be classed as wet locations where the access door is not suitably protected against entrance of rain or spray by an overhanging deck or by other means.

(c) *Dry location.* Dry locations shall be deemed to be passengers' and crew's quarters, pantries, passageways adjacent to quarters, public washrooms and toilets which are not equipped with baths or showers, radio room, gyro room, and chart room.

§ 110.15–120 Marine inspector or inspector.

These terms means any person from the civilian or military branch of the Coast Guard assigned under the superintendence and direction of an Officer in Charge, Marine Inspection, or any other person as may be designated for the performance of duties with respect to the inspection, enforcement, and administration of Title 52, R.S., and acts amendatory thereof or supplemental thereto, and rules and regulations thereunder.

§ 110.15–125 Motorboat.

This term means any vessel indicated in Columns 4 or 5 of Table 110.05–1(a), 65 feet in length or less which is propelled by machinery (including steam). The length shall be measured from end to end over the deck excluding sheer. This term includes a boat temporarily or permanently equipped with a detachable motor and any such boat when so propelled is subject to the applicable provisions of the Act of April 25, 1940, as amended (secs. 1 to 22, 54 Stat. 163–167, as amended, 46 U.S.C. 526–526u), and the regulations promulgated thereunder. For the purpose of this subchapter motorboats are included under the term "vessel" unless specifically noted otherwise. The various classes of motorboats are as follows:

Class A—Any motorboat less than 16 feet in length.
Class 1—Any motorboat 16 feet or over and less than 26 feet in length.
Class 2—Any motorboat 26 feet or over and less than 40 feet in length.
Class 3—Any motorboat 40 feet or over and not more than 65 feet in length.

§ 110.15–128 Nuclear vessel.

(a) A nuclear vessel is a vessel provided with a nuclear powerplant for propulsion or any other purpose, or any vessel handling or processing substantial amounts of radioactive material other than as cargo.

§ 110.15–130 Ocean.

Under this designation shall be included all vessels navigating the waters of any ocean or the Gulf of Mexico more than 20 nautical miles offshore.

§ 110.15–135 Officer in Charge, Marine Inspection.

This term means any person from the civilian or military branch of the Coast Guard designated as such by the Commandant and who, under the superintendence and direction of the Coast Guard District Commander, is in charge of an inspection zone for the performance of duties with respect to the inspections, enforcement, and administration of Title 52, Revised Statutes, and acts amendatory thereof or supplemental thereto, and rules and regulations thereunder.

§ 110.15–140 Passenger.

A passenger is every person other than the master and members of the crew or other persons employed or engaged in any capacity on board a vessel in the business of that vessel. In the case of a vessel on an international voyage a child under one year of age is not counted as a passenger.

§ 110.15–155 Propulsion engine.

This term means one or more machines driving a single propeller or paddlewheel shaft for propulsion of the vessel.

§ 110.15–160 Qualified person.

(a) A qualified person is one who by his special knowledge, abilty, and experience is able to competently and safely perform the required functions and duties.

§ 110.15–165 Rivers.

Under this designation shall be included all vessels whose navigation is restricted to rivers and/or canals, exclusively, and to such other waters as may be so designated by the Coast Guard District Commander.

§110.15–170 Recognized classification society.

The term "recognized classification society" means the American Bureau of Shipping or other classification society recognized by the Commandant.

§ 110.15–175 Rotating machinery; enclosure, ventilation and protection terms.

(a) *Self-ventilated machine.* A self-ventilated machine is one which has its ventilating air circulated by means integral with the machine.

(b) *Separately ventilated machine.* A separately ventilated machine is one which has its ventilating air supplied by an independent fan or blower external to the machine.

(c) *Enclosed self-ventilated machine.* An enclosed self-ventilated machine is a machine having openings for the admission and discharge of the ventilating air, which is circulated by means integral with the machine, the machine being otherwise totally enclosed. These openings are so arranged that inlet and outlet ducts or pipes may be connected to them.

NOTE: Such ducts or pipes, if used, must have ample section and be so arranged as to furnish the specified volume of air to the machine, otherwise the ventilation will not be sufficient.

(d) *Enclosed separately ventilated machine.* An enclosed separately ventilated machine is a machine having openings for the admission and discharge of the ventilating air, which is circulated by means external to and not a part of the machine, the machine being otherwise totally enclosed. These openings are so arranged that inlet and outlet duct pipes may be connected to them.

(e) *Open machine.* An open machine is one having ventilating openings which permit passage of external cooling air over and around the windings.

(f) *Totally enclosed machine.* A totally enclosed machine is one so enclosed as to prevent exchange of air between the inside and the outside of the case, but not sufficiently enclosed to be called airtight.

(g) *Totally enclosed fan-cooled machine.* A totally enclosed fan-cooled machine is a totally enclosed machine equipped for exterior cooling by means of a fan or fans, integral with the machine but external to the enclosing parts.

(h) *Protected machine.* A protected machine is an open machine in which all openings giving direct access to live or rotating parts (except smooth shafts) are limited in size by the design of the structural parts, or by screens, grilles, expanded metal, etc., to prevent accidental contact with such parts. Such openings are of such size as not to permit the passage of a cylindrical rod ½ inch in diameter, except where the distance from the guard to the live or rotating parts is more than 4 inches they are of such size as not to permit the passage of a cylindrical rod ¾ inch in diameter.

(i) *Drip-proof machine.* A drip-proof machine is one in which the ventilating openings are so constructed that drops of liquid or solid particles falling on the machine at any angle not greater than 15 degrees from the vertical, cannot enter the machine either directly or by striking and running along a horizontal or inwardly inclined surface.

(j) *Explosion-proof machine.* An explosion-proof machine is one enclosed in a case which is capable of withstanding an explosion of a specified gas or vapor which may occur within it, and of preventing the ignition of the specified gas or vapor surrounding the enclosure by sparks, flashes or explosions of the gas or vapor within.

(k) *Waterproof machine.* A waterproof machine is a totally enclosed machine so constructed that a stream of water from a hose (not less than 1 inch in diameter) under a head of 35 feet and from a distance of about 10 feet can be played on the machine from any direction for a period of 15 minutes without leakage, except that leakage which may occur around the shaft may be considered permissible, provided it is prevented from entering the oil reservoir and provision is made for automatically draining the machine. The hose nozzle should be adjusted to give a solid stream at the enclosure. The machine should be provided with a check valve for drainage or a tapped hole at the lowest part of the frame which will serve for application of drain pipe or drain plug.

§ 110.15–177 Rules of the Road.

(a) The term "Rules of the Road" means the statutory and regulatory rules

governing navigation of vessels. These rules are also published by the Coast Guard in pamphlet form as follows:

(1) Rules of the Road—International—Inland (CG–169).

(2) Rules of the Road—Great Lakes (CG–172).

(3) Rules of the Road—Western Rivers (CG–184).

(b) The current editions of the "Rules of the Road" pamphlets may be obtained from any Marine Inspection Office.

§ 110.15–180 Short international voyage.

For the purpose of this subchapter, the expression "short international voyage" means an international voyage in the course of which a vessel is not more than 200 miles from a port or place in which the passengers and crew could be placed in safety, and which does not exceed 600 miles in length between the last port of call in the country in which the voyage begins and the final port of destination.

§ 110.15–185 Switching equipment.

(a) *Switches*—(1) *Switch.* A switch is a device for making, breaking or changing the connections in an electric circuit.

(2) *Knife switch.* A knife switch is a form of air switch in which the moving element, usually a hinged blade, enters or embraces the contact clips. In some cases, however, the blade is not hinged and is removable.

(3) *Rated continuous current (of a switch or circuit breaker).* The rated continuous current of a switchgear device, or an assembly, is the maximum direct current, or rms current, in amperes at rated frequency which it will carry continuously without exceeding the limit of observable temperature rise.

(4) *Rated voltage (of a switch or circuit breaker).* The rated voltage of a device, or an assembly, is the voltage to which its operating and performance characteristics are referred.

(5) *General use switch.* A general use switch is a switch intended for use in general distribution and branch circuits. It is rated in amperes and is capable of interrupting the rated current at the rated voltage.

(6) *Isolating switch.* An isolating switch is a switch intended for isolating an electric circuit from the source of power. It has no interrupting rating and is intended to be operated only after the circuit has been opened by some other means.

(7) *Motor-circuit switch.* A motor-circuit switch is a switch intended for use in a motor branch circuit. It is rated in horsepower and is capable of interrupting the maximum operating overload current of a motor of the same rating at the rated voltage.

(8) *"T" rated switch.* A "T" rated switch is a switch intended to control tungsten-filament lamp loads.

(9) *Master switch.* A master switch is a switch which dominates the operation of contactors, relays, or other remotely operated devices.

(b) *Interrupting devices*—(1) *Circuit breaker.* A circuit breaker is a device for closing and interrupting a circuit between separable contacts under both normal and abnormal conditions.

NOTE: Ordinarily circuit breakers are required to operate relatively infrequently, although some classes of breakers are suitable for frequent operation.

NOTE: Normal indicates the interruption of currents not in excess of the rated continuous current of the circuit breaker. Abnormal indicates the interruption of currents in excess of such rated continuous current, such as short circuits.

(2) *Rated interrupting current (rated interrupting capacity).* The rated interrupting current of a circuit breaker is the highest current which the breaker is rated to interrupt at rated voltage and under specified operating duty. (As applied to breakers which allow the current to reach its maximum value, the rated interrupting current is the current at the start of the interrupting process. As applied to breakers which prevent the current from reaching its maximum value, the rated interrupting current is the highest available current of the circuit which the breaker is rated to interrupt).

(3) *Reverse-power tripping.* Reverse-power tripping signifies the tripping of a circuit breaker upon reversal of power in the main circuit.

NOTE: In direct-current practice the terms "reverse power" and "reverse current" are synonymous.

(4) *Undervoltage tripping.* Undervoltage tripping signifies the tripping of a circuit breaker by automatic means when the main circuit voltage decreases to a predetermined value.

(5) *Nonautomatic tripping.* Nonautomatic tripping signifies the tripping of a circuit interrupter only in response to an act of an operator.

(c) *Fuses*—(1) *Fuse.* A fuse is an overcurrent protective device with a circuit opening fusible member which is heated and severed by the passage of overcurrent through it.

(2) *Voltage rating.* The voltage rating of a fuse is the rms alternating or direct voltage for which it is designed.

(3) *Current rating.* The current rating of a fuse is the designated rms alternating, or direct current which it will carry continuously under stated conditions.

(d) *Relays*—(1) *Relay.* A relay is a device that is operative by a variation in the conditions of one electric circuit to effect the operation of other devices in the same or another electric circuit.

NOTE: Where relays operate in response to changes in more than one condition, all functions should be mentioned.

(2) *Current relay.* A current relay is one that functions at a predetermined value of current. It may be an overcurrent relay, an undercurrent relay, a combination of both.

(3) *Overload relay.* An overload relay is an overcurrent relay which functions at a predetermined value of overcurrent to cause disconnection of the load from the power supply.

NOTE: An overload relay is intended to protect the load (for example, motor armature) or its controller, and does not necessarily protect itself.

(4) *Voltage relay.* Voltage relay is one that functions at a predetermined value of voltage. (It may be an overvoltage relay, an undervoltage relay, or a combination of both).

(5) *Instantaneous.* Instantaneous is a qualifying term applied to a relay indicating that no delay is purposely introduced in its action.

(6) *Inverse time.* Inverse time is a qualifying term applied to a relay indicating that its time of operation decreases as the magnitude of the operating quantity increases.

(7) *Overcurrent protection (overload protection).* Overcurrent protection operates to disconnect the protected equipment on excessive current.

(8) *Undervoltage protection (lowvoltage protection).* Undervoltage or lowvoltage protection is the effect of a device operative on the reduction or failure of voltage to cause and maintain the interruption of power in the main circuit.

(9) *Undervoltage release (lowvoltage release).* Undervoltage or lowvoltage release is the effect of a device operative on the reduction or failure of voltage to cause the interruption of power in the main circuit, but not to prevent the reestablishment of the main circuit on return of voltage.

(10) *Overspeed protection.* Overspeed protection operates to disconnect the protected equipment when the speed of rotation is in excess of a predetermined amount.

(e) *Regulators*—(1) *Regulator.* A regulator is a device which functions to maintain a designated characteristic at a predetermined value, or to vary it according to a predetermined plan.

(2) *Generator voltage regulator.* A generator voltage regulator is a regulator which functions to maintain the voltage of a synchronous generator, condenser, motor, or of a direct-current generator, at a predetermined value, or vary it according to a predetermined plan.

(f) *Switchgear assemblies*—(1) *Power switchboard.* A power switchboard is a type of switchboard including main circuit switching and interrupting devices, together with their interconnections.

(2) *Live-front switchboards.* A live-front switchboard is one having exposed live parts on the front.

(3) *Dead-front switchboard.* A dead-front switchboard is one having no exposed live parts on the front, which constitutes a grounded metal barrier between the operator and the apparatus.

(4) *Distribution switchboard.* A distribution switchboard is a power switchboard used for the distribution of electric energy at the voltages common for such distribution within a ship.

NOTE: Knife switches, air circuit breakers, and fuses are generally used for circuit interruption on distribution switchboards, and voltages seldom exceed 600. However, such switchboards often include switchboard equipment for a high tension incoming supply circuit and a stepdown transformer.

(5) *Automatic transfer equipment.* An automatic transfer equipment is one which automatically transfers a load so that a source of power may be selected from two or more incoming lines.

§ 110.15–190 Vessel.

(a) Where the word "vessel" is used in this subchapter, it shall be considered to include all vessels indicated in Columns 3, 4, and 5 of Table 110.05–1(a) except as otherwise noted.

(1) *Cargo vessel.* Where the term "cargo vessel" is used in this subchapter it shall be considered to include all vessels indicated in Column 5 of Table 110.05–1 (a) except as otherwise noted.

(2) *Passenger vessel.* Where the term "passenger vessel" is used in this subchapter it shall be considered to include all vessels indicated in Column 4 of Table 110.05–1 (a) except as otherwise noted.

(3) *Tank barge; tank ship; tank vessel.* For definitions of these terms as used in this subchapter, see § 111.70–5 (i), (j), and (k) of this subchapter.

(4) *Barge.* Where the term "barge" is used in this subchapter, it shall be considered to include all nonself-propelled vessels.

§ 110.15–195 Western rivers.

For the purpose of this subchapter, the term "western rivers" is as defined in CG–184, "Rules of the Road—Western Rivers."

Subpart 110.20—Equivalents

§ 110.20–1 Conditions under which equivalents may be used.

(a) Where in this subchapter it is provided that a particular fitting, material, appliance, apparatus, or equipment, or type thereof, shall be fitted or carried in a vessel, or that any particular provision shall be made or arrangement shall be adopted, the Commandant may accept in substitution therefor any other fitting, material, apparatus, or equipment, or type thereof, or any other arrangement: *Provided*, That he shall have been satisfied by suitable trials that the fitting, material, appliance, apparatus, or equipment, or type thereof, or the provision or arrangement is at least as effective as that specified in this subchapter.

(b) In any case where it is shown to the satisfaction of the Commandant that the use of any particular equipment, apparatus, or arrangement is unreasonable or impracticable, the Commandant may permit the use of alternate equipment, apparatus, or arrangement to such an extent and upon such condition as will insure, to his satisfaction, a degree of safety consistent with the minimum standards set forth in this subchapter.

Subpart 110.25—Special Provisions

§ 110.25–1 Vessels acquired or documented under the Act of August 9, 1954.

(a) Vessels acquired or documented under the Act of August 9, 1954 (sec. 3, 68 Stat. 675, 50 U.S.C. 198), shall be subject to the applicable provisions of Title 52 of the Revised Statutes, acts amendatory thereto and the rules and regulations thereunder.

(b) Unapproved lifesaving, firefighting, and other equipment may be continued in service so long as, in the opinion of the Officer in Charge, Marine Inspection, such equipment is in good and serviceable condition. All replacements shall be in accordance with Coast Guard requirements for new vessels.

§ 110.25–5 Installations of equipment made during the Unlimited National Emergency declared by the President on May 27, 1941.

Boilers, pressure vessels, machinery, piping, electrical, and other installations, including lifesaving, firefighting, and other safety equipment, installed on vessels during the Unlimited National Emergency declared by the President on May 27, 1941, and prior to the termination of Title V of the Second War Powers Act, as extended (sec. 501, 56 Stat. 180, 50 U. S. C., App. Sup. 635), which do not fully meet the detail requirements of the regulations in this chapter, may be continued in service if found to be satisfactory by the Commandant for the purpose intended.

PART 111—ELECTRICAL SYSTEM; GENERAL REQUIREMENTS

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111.90-25 Vessels contracted for between June 2, 1941, and November 18, 1952.

AUTHORITY: The provisions of this Part 111 issued under R.S. 4405, as amended, 4462, as amended; 46 U.S.C. 375, 416. Interpret or apply R.S. 4399, as amended, 4400, as amended, 4417, as amended, 4417a, as amended, 4418, as amended, 4421, as amended, 4426, as amended, 4427, as amended, 4433, as amended, 4453, as amended, 4488, as amended, 4491, as amended, sec. 14, 29 Stat. 690, as amended, sec. 10, 35 Stat. 428, as amended, 41 Stat. 305, as amended, sec. 5, 49 Stat. 1384, as amended, secs. 1, 2, 49 Stat. 1544, 1545, as amended, sec. 17, 54 Stat. 166, as amended, sec. 3, 54 Stat. 347, as amended, sec. 3, 70 Stat. 152, sec. 3, 68 Stat. 675; 46 U.S.C. 361, 362, 391, 391a, 392, 399, 404, 405, 411, 435, 481, 489, 366, 395, 363, 369, 367, 526p, 1333, 390b, 50 U.S.C. 198; E.O. 11239, July 31, 1965, 30 F.R. 9671, 3 CFR, 1965 Supp. Treasury Department Orders 120, July 31, 1950, 15 F.R. 6521; 167-14, Nov. 26, 1954, 19 F.R. 8026; 167-20, June 18, 1956, 21 F.R. 4894; CGFR 56-28, July 24, 1956, 21 F.R. 5659; 167-38, Oct. 26, 1959, 24 F.R. 8857.

Subpart 111.01—Application

§ 111.01-1 General.

(a) The provisions of this part, with the exception of Subpart 111.90 of this part, shall, unless otherwise indicated, apply to all vessels contracted for on or after November 19, 1952. The provisions of Subpart 111.90 of this part shall apply to all vessels contracted for prior to November 19, 1952.

CROSS REFERENCE: See § 110.05-3 of this subchapter for application of amendments to regulations.

§ 111.01-5 Should; meaning of.

(a) In order to have, wherever possible in this part, the identical wording contained in Section 35 of the American Bureau of Shipping Rules for the Classification and Construction of Steel Vessels, the word "should" has been used instead of "shall". Therefore, in each such instance where this word "should" is used in this part (except §§ 111.05-10 (c), 111.05-10 (d) and 111.05-10 (f)) to describe, or as applicable to, the equipment or installation, this word is to be considered the same as the word "shall" in describing Coast Guard requirements.

Subpart 111.05—General Requirements

§ 111.05-1 Construction and installation.

(a) Electrical apparatus and wiring systems shall be in accordance with the requirements of this part. The requirements of this part are applicable to all vessels but may be modified by the Commandant for vessels certificated for limited service or for vessels less than 300 gross tons. The requirements of this part are minimum requirements and it is recommended that details not covered by the regulations be in general conformity with Standard No. 45 of the American Institute of Electrical and Electronic Engineers. (See § 110.10-1(e) of this subchapter.)

§ 111.05-5 Plan approval.

(a) *General.* (1) The required plans listed in this subpart are general in character, but include all plans which normally show construction and safety features coming under the cognizance of the Coast Guard. In the case of a particular vessel, all of the plans enumerated may not be applicable, and it is intended that only those plans and specifications be submitted as will clearly show the vessel's arrangement, construction and required equipment.

(2) In the list of required plans given in this section, those indicated by an asterisk cover the electrical items necessary for the approval of the installation by the American Bureau of Shipping for vessels classed by that organization. When prints bearing record of such approval by the American Bureau of Shipping are forwarded to the Coast Guard, they will, in general, be accepted as satisfactory except insofar as the law or the regulations in this chapter contain requirements which are not covered by the American Bureau of Shipping.

(b) *Procedure for submittal of plans.* (1) As the relative locations of shipyards, design offices, and Coast Guard offices vary throughout the country, no specific routing will be required in the submittal of plans. In general, one of the procedures outlined in this paragraph would apply, but in a particular case, if a more expeditious procedure can be used, there will be no objection to its adoption.

(2) The plans may be submitted to the Officer in Charge, Marine Inspection, at or nearest the place where the vessel is to be built. This procedure wil be most expeditious in the case of those offices where personnel and facilities are available for examination and approval of the plans locally.

(3) The plans may be submitted directly to the Commandant (MMT), U. S. Coast Guard, 1300 E Street, NW., Washington, D.C., 20226. In this case, the plans will be returned directly to the submitter, with a copy of the action being forwarded to the interested Officer in Charge, Marine Inspection.

(4) The plans may be submitted directly to field technical offices.

(i) Commander, 3d Coast Guard District (mmt), 45 Broadway, New York, N.Y., 10006, for the geographical area covered by 1st, 3d and 5th Coast Guard Districts.

(ii) Commander, 8th Coast Guard District (mmt), Room 308, Customhouse, New Orleans, La., 70130, for geographical area covered by 2d, 7th and 8th Coast Guard Districts.

(iii) Commander, 12th Coast Guard District (mmt), 630 Sansome Street, San Francisco, Calif., 94501, for geographical area covered by 11th, 12th, 13th, 14th and 17th Coast Guard Districts.

(5) In the case of classed vessels, upon specific request by the submitter, the American Bureau of Shipping will arrange to forward the necessary plans to the Coast Guard indicating its action thereon. In this case, the plans will be returned as noted in subparagraph (3) of this paragraph.

(c) *Number of plans required.* (1) Four copies of each plan are normally required so that one can be returned to the submitter. If the submitter desires additional approved plans, a suitable number should be submitted to permit the required distribution.

(d) *Electrical plans required for new construction.*[1] (1) Specifications.

(2)* General Arrangements.

(3)* Switchboard front, rear, end, and section views.

(4)* Switchboard wiring diagram.

(5)* Switchboard material and nameplate list.

(6) Elementary wiring diagram of metering and automatic switchgear.

(7)* Description of operation of propulsion control and bus transfer switchgear.

(8) * Elementary (one line) wiring diagram of power system (supplemented by cable lists, panelboard summaries, etc., if desired) giving:

(i)* Type and size of generators;

(ii)* Type and size of generator cables, bus-tie cables, feeders, and branch circuit cables;

(iii) Power, lighting, and interior communication panelboards showing number of circuits and rating of energy consuming devices;

(iv) Type and capacity of storage batteries;

[1] The items marked with an asterisk (*) indicate such items may require the approval of the American Bureau of Shipping.

(v)* Rating of circuit breakers and switches, interrupting capacity of circuit breakers, and rating or setting of overcurrent devices.

(9)* Electric plant summary showing connected loads and calculated operating loads for various conditions of operation.

(10)* Isometric or deck wiring plans of power system, including symbol list.

(11) Elementary wiring diagram of steering gear alarm circuits and ventilation shut-down control.

(12) Elementary wiring diagram and isometric or deck wiring diagrams of electric watertight door system, fire screen door holding system, and power operated lifeboat winches.

(13)* Generators, propulsion motors, and vital auxiliary motors. Manufacturer's outline drawing of each giving nameplate data, degree of enclosure, type of insulation, temperature rise above stated ambient temperature, duty cycle, and application or name of auxiliary driven. Vital motors are those essential, or those which are part of a system that is essential, to the safe operation and navigation of the vessel. Examples of such vital auxiliary motors are propulsion auxiliary motors, steering gear motors, fire and bilge pump motors, motors driving emergency M–G sets, etc.

(14)* Motor starters. Manufacturer's enclosure outline drawing, control elementary wiring diagram, and application of each. For lifeboat winch motor starters, see § 111.65–40.

(15) Distribution panelboards, branch boxes, enclosed switches, pushbutton stations, control switches, etc. Manufacturer's outline drawing or suitable identification on deck wiring plan symbol list. For lifeboat winch control switches, see § 111.65–40.

(16) Isometric or deck wiring plan of lighting feeders.

(17)* Deck plans of lighting system showing location of cables, fixtures, and wiring devices, cable sizes and types, and manufacturer's name and identification of fixtures and wiring devices. If manufacturer's name and identification are contained in a symbol list, the corresponding symbol marking should be employed on the deck plans.

(18) Elementary and isometric or deck wiring diagrams of engine order telegraph system, sound powered telephone system, general alarm system, emergency loudspeaker system, rudder angle indicator system, shaft speed indicator system, gyro compass system, gyro pilot system, radio system, radar plan position indicator system, loran system, refrigerated spaces alarm system, etc., with material identified by name of manufacturer and drawing and/or catalog number. If manufacturer's name and identification are contained in a symbol list, the corresponding symbol marking should be employed on the deck plans.

(19) Elementary and deck wiring plans of fire detecting and alarm system, manual alarm system, smoke detecting system, carbon dioxide extinguishing system alarms, and supervised patrol system, with material identified by name of manufacturer and drawing and/or catalog number. If manufacturer's name and identification are contained in a symbol list, the corresponding symbol marking should be employed on the deck plans.

(e) *Electrical plans required for repairs and alterations of existing vessels.* (1) No repairs or alterations affecting the safety of the vessel shall be made without the knowledge of the Officer in Charge, Marine Inspection.

(2) Drawings of alterations shall be approved before work is started unless deemed unnecessary by the Officer in Charge, Marine Inspection. The general scope of the plans shall be as noted in paragraph (d) of this section. Drawings will not be required for repairs in kind.

§ 111.05–10 Testing and inspection.

(a) *Application.* This section shall be applicable to all vessels, both those existing as of November 18, 1952, and those contracted for on and after November 19, 1952.

(b) (1) The general requirements for inspection of vessels are contained in Part 31 of Subchapter D (Tank Vessels), Part 71 of Subchapter H (Passenger Vessels), and Part 91 of Subchapter I (Cargo and Miscellaneous Vessels) of this chapter. The contents of this section supplement the general requirements contained in other parts of this chapter.

(2) In the inspection of electrical equipment and installations, the rules promulgated by the American Bureau of Shipping respecting materials and construction, and the certificate of classification referring thereto, except when otherwise provided for by the rules and regulations of this subchapter, shall be accepted as standard.

(i) The requirements of this paragraph shall not be construed to imply that ship tests or factory inspections of electrical apparatus or equipment of the types regularly conducted by the American Bureau of Shipping will be conducted by the Coast Guard. Shop tests of electrical apparatus or equipment will be conducted by the Coast Guard only when specifically required by the regulations in this chapter, or when specifically requested, either by the manufacturer, shipbuilder, owner, or the Coast Guard, and agreed to by all concerned.

(c) *Initial inspection*—(1) *Scope.* The initial inspection, which may consist of a series of inspections during the construction of the vessel, shall include a complete inspection of the electrical installation and electrical equipment or apparatus. The inspection shall be such as to insure that the arrangement, materials, and installations thereof, fully comply with the applicable regulations in this chapter and are in accordance with approved plans. The inspection shall also be such as to insure that the workmanship of all equipment and apparatus and the installation thereof is, in all respects, satisfactory.

(2) *Inspections required.* The specific inspections described in this paragraph are intended as suggestions to the marine inspector. It is not the intention of this paragraph to require, in the case of any particular vessel, any tests which, in the opinion of the Officer in Charge, Marine Inspection, are unnecessary.

(3) *Electric cable.* Electric cable should be checked during installation for size and type as shown on the approved plans. The adequacy of cable supports should be checked, and it should be ascertained that no cable is installed in the proximity of steam pipes or other hot objects and that the cables have not been damaged during the installation due to excessive pulling force having been applied, or due to sharp bends or sharp or rough edges of cable supports or bulkhead penetrations, etc. Cable penetrations required to be watertight should be checked for proper packing of the terminal or stuffing tubes, including provisions for future take-up of gland nuts.

(4) *Generators.* Generators should be checked for general condition, both electrical and mechanical, voltage regulation, parallel operation, operation of safety devices such as reverse current or reverse power trips, overcurrent trips, overspeed trips, low oil pressure trips, etc.

(5) *Rotating electrical machinery.* Rotating electrical machinery should be checked to assure that rotating and/or uninsulated electrical parts are adequately shielded from accidental contact by personnel.

(6) *Switchboards.* Switchboards should be checked for hand rails, guard rails, working spaces, insulating floor covering, drip covers, and enclosures for backs and ends. Switchboard mounted apparatus should be checked for identifying nameplates. Circuit nameplates should be compared with the rating or setting of the overcurrent devices and with the approved plans. The accessibility of items requiring maintenance or adjustment should be checked. Meters should be checked for proper calibration. The operation of automatic switchgear and mechanical interlocks should be observed.

(7) *Motor starters.* Motor starters should be checked to assure proper starting of the motor under service conditions. A wiring diagram of each motor starter should be secured to the inside of its enclosure door. Each motor starter not completely disconnected from all sources of potential when the disconnect switch is opened (due to electrical interlocked circuits necessary for proper operation of the apparatus or for other valid reasons) should be checked to assure that attention is directed to such conditions by a suitable sign.

(8) *Disconnect switches.* The presence and location of disconnect switches required for motor starters, fuses, etc., should be checked. When a switch or circuit breaker on a switchboard or distribution panel is intended to serve as a motor and controller disconnect switch, it shall be determined that the applicable requirements of the regulations in this subchapter have been met.

(9) *Accessibility.* The accessibility of electrical apparatus for normal inspection and maintenance should be ob-

served. The accessibility of junction boxes and the like in way of paneling should be noted during construction of a vessel. Hinged doors of motor starters and similar apparatus should be checked for interference with adjacent structural parts or apparatus.

(10) *Panelboards.* The rating or setting of the overcurrent devices should be compared with the values given on the circuit directory and with the approved plans. The accuracy of the directory description of loads served by each circuit should be checked.

(11) *Grounding.* It should be determined that metal enclosures for electrical equipment are grounded, either by the method of mounting or by ground leads. Portable equipment should be checked for grounding through the grounding conductor of the supply cable.

(12) *Emergency lighting and exit lights.* The adequacy of emergency lights and exit lights should be checked at night with all general lighting turned off.

(13) *General alarm system.* The general alarm system should be checked with a sound level meter, the sound level of the bells being measured in each stateroom for passengers or crew with doors closed. Where the background noise level is questionable, the background noise level should be measured while the vessel is underway. For the required sound levels, see § 113.25–10 (c) of this subchapter.

(14) *Emergency loudspeaker system.* The emergency loudspeaker system should be checked with a sound level meter, the sound level being measured at several locations in the vicinity of each lifeboat handling station, each lifeboat embarkation station, each passenger assembly station, and throughout crew quarters. Where the background noise level is questionable, the background noise level should be measured while the vessel is underway. For the required sound levels, see Table 113.50–15 in § 113.50–15 of this subchapter. It should be demonstrated that voice reproduction is of good quality and intelligibility is of a high order. It should be demonstrated that grounding or opening either conductor or "shorting" both conductors to a typical lifeboat station loudspeaker or to a typical embarkation deck loudspeaker, each to be selected by an inspector, will not reduce the output of any one of the remaining loudspeakers by more than three decibels.

(15) *Fire detecting systems.* Fire detecting systems should be checked for compliance with the applicable regulations in this chapter and for conformance with the approved plans. Power supply circuits and thermostat circuits should be checked for supervision.

(16) *Communication systems.* All communication systems should be checked for performance and for compliance with the regulations in this chapter.

(17) *Insulation resistance.* All electric power and lighting cable and equipment should be checked for proper insulation resistance to ground and between conductors.

(d) *Inspection for certification*—(1) *General.* The inspection of electrical installations at the annual or biennial inspection incident to reissuance of a certificate of inspection shall include an inspection of all items enumerated in paragraph (c) of this section to the extent necessary to determine mechanical and electrical condition of performance. Particular note should be made of circuits added or modified after the initial inspection.

(2) *Fire detecting system.* Fire detecting thermostats should be tested at regular intervals (at least 25 percent of those installed tested annually) to detect any change in operating characteristics. A portable hand light with an open end sheet metal shield (such as a No. 3 fruit can) replacing the usual guard and globe would usually serve as a source of heat to operate the thermostat without damage to paint work or to the thermostat itself. Any thermostat requiring a time to operate materially different from the average when covered with the heating device should be suspected of being defective and forwarded to Coast Guard Headquarters for further testing.

(3) *Vital machinery.* Motors, motor starters and control switches used with machinery vital to the safety or propulsion of the vessel should be examined visually and opened for closer inspection when there is evidence of deterioration.

(4) *Storage batteries.* Storage batteries used for emergency lighting, diesel-engine-driven emergency generator starting, general alarm, etc., should be checked for capacity. Storage batteries supplying emergency lighting should be required to carry the connected loads for the prescribed length of time.

(e) *Repairs or alterations.* An inspection, either general or partial, depending upon the circumstances, shall be made whenever any important repairs or alterations are undertaken.

§ 111.05–15 General considerations.

(a) *General.* (1) Electrical installations on vessels shall be such that:

(i) Services essential for safety will be maintained under various emergency conditions; and

(ii) The safety of passengers, crew, and vessel from electrical hazards will be assured.

(2) Electrical equipment should be so placed or protected as to minimize the possibility of mechanical injury or damage from the accumulation of dust, oil vapors, steam, or dripping liquids. Apparatus liable to arc should be ventilated or placed in ventilated compartments in which flammable gases, acid fumes, and oil vapors cannot accumulate. Skylights and ventilators are to be so arranged as to avoid the possibility of flooding the apparatus.

(b) *Protection from bilge water.* All generators, motors, and electric couplings are to be so arranged that they cannot be damaged by bilge water, and if necessary a watertight coaming should be provided to form a well around the base of such equipment with provisions for removing water from the well.

(c) *Accessibility.* The design and arrangement of electrical apparatus should provide accessibility to parts requiring inspection or adjustment. Armature and field coils, rotors and revolving fields should be removable, and where air ducts are used there should be means of access.

(d) *Watertight equipment.* All electrical equipment exposed to the weather or located in spaces where they would be exposed to seas, splashing, or other severe moisture condition, shall be of the watertight type or be protected by means of watertight enclosures which shall be such as to prevent the exposure of the equipment to temperatures in excess of those for which they have been designed.

(e) *Corrosion-resistant parts.* Enclosures, working and other parts of electrical equipment which would be damaged or rendered ineffective by corrosion shall be made of corrosion-resistant materials or of material rendered adequately corrosion resistant.

(f) *Grounding of permanent equipment.* (1) All exposed metal parts of electrical machines or equipment which are not intended to be "live," but are liable to become "live" under fault conditions, shall be grounded and all electrical apparatus shall be so constructed and so installed that danger of injury in ordinary handling shall not exist.

(2) Metal frames of all portable lamps, tools, and similar apparatus supplied as ship's equipment and rated 30 volts or more alternating current or 50 volts or more direct current shall be grounded through a suitable conductor in the supply cable.

(g) *Means for ground detection.* (1) Adequate means for ground detection for ships' power and lighting systems and distribution systems isolated from the ships' power and lighting systems by transformers or motor-generator sets shall be provided.

(2) If lamps are used for ground detection they shall have a rating of not more than 25 watts nor less than 5 watts operating at approximately one-half voltage in the absence of grounds.

(3) For dual-voltage, grounded-neutral, alternating current distribution systems, an ammeter shall be provided to indicate current flowing in the ground connection. The ammeter shall have a full scale range of 10 amperes. An ammeter switch of the spring return to "on" (ammeter read) type shall be provided. Where the ammeter is located remote from the ground connection and a current transformer is used, a suitable protective device shall be provided near the current transformer to prevent high voltage in the event of an open circuit. The ammeter and associated equipment shall be capable of sustaining without damage the maximum fault current available.

(h) *Limitations of porcelain use.* Porcelain should not be used for lamp sockets, switches, receptacles, fuse blocks, etc., where the material is rigidly fastened by machine screws or the equivalent.

§ 111.05–20 Temperature ratings.

(a) In the requirements of this subchapter, except as noted in paragraph (b) of this section, an ambient temperature of 40° C. has been assumed for all locations except boiler and engine rooms, while for these latter spaces 50° C. has been assumed as the ambient temperature. Where the ambient temperature is in excess of these values, the total temperature specified shall not be exceeded. Where equipment has been rated on ambient temperatures less than those contemplated, consideration will be given to the use of such equipment provided the total temperature for which the equipment is rated will not be exceeded.

(b) For the assumed ambient temperature for lighting fixtures, see § 111.60–35 (c) (2). For the assumed ambient temperature for thermal trip circuit breakers, see § 111.55–15(e) (6).

§ 111.05–25 Nature of electrical supply.

(a) *Standard systems.* The following systems of distribution are recognized as standard:

(1) Two-wire with direct current or single phase alternating current;

(2) Three-wire with direct current or single phase alternating current; and,

(3) Three-wire, three-phase alternating current.

(4) Four-wire, three-phase alternating current.

(b) *Standard voltages.* The voltages given in Table 111.05–25 (b) are recognized as standard.

TABLE 111.05-25 (b)—STANDARD VOLTAGES

Equipment	Direct current (volts)	Alternating current (volts)
Lighting	115	115.
Power	115 and 230	115, 230, and 440.
Generators	120 and 240	120, 230, and 450.
Propulsion	1,000 maximum	7,500 maximum.

(c) *Standard frequency.* A frequency of 60 cycles per second is recognized as standard for alternating-current lighting and power systems.

(d) *Others.* Special consideration will be given to systems, voltages, or frequencies differing from the recognized standard.

§ 111.05–30 Insulation materials.

(a) *Class designation.* Insulation material referred to in this subchapter is designated by class as described in this section.

(b) *Class O insulation.* Materials or combinations of materials such as cotton, silk, and paper without impregnation.[1]

(c) *Class A insulation.* Materials or combinations of materials consisting of (1) cotton, silk, paper, and similar organic materials when either impregnated [1] or immersed in a liquid dielectric; (2) molded and laminated materials with cellulose filler, phenolic resins, and sheets of cellulose acetate and other cellulose derivatives of similar properties and (3) varnishes (enamels) as applied to conductors. (ASA–C50.)

(d) *Class B insulation.* Materials or combinations of materials such as mica, asbestos, fiberglass, and similar inorganic materials in built-up form with organic binding substances. A small proportion of Class A material may be used for structural purposes only. Fiberglass or asbestos magnetic wire insulation are included in this temperature class. These may include supplementary organic materials, such as polyvinylacetal or polyamide films. (ASA–C50.)

(e) *Class C insulation.* Materials consisting entirely of mica, porcelain, glass, quartz, and similar inorganic materials. (ASA–C50.)

(f) *Class F insulation.* A Class F insulation system is one which by experience or accepted test can be shown to have suitable thermal endurance when operating at the limiting Class F temperature specified in the temperature rise standard for the machine under consideration. Typical materials used in a Class F system include mica, glass fiber, asbestos and other materials, not necessarily inorganic, with compatible bonding substances having suitable thermal stability. (NEMA Publication No. MG1.)

(g) *Class H insulation.* Materials or combinations of materials consisting of (1) mica, asbestos, fiberglass, and similar inorganic materials in built-up form with binding substance composed of silicone compounds, or materials with equivalent properties; (2) silicone compounds in rubbery or resinous forms, or materials with equivalent properties. A minute proportion of Class A material may be used only where essential for structural purposes during manufacture. (ASA–C50.)

[1] Insulation is considered to be "impregnated" when a suitable substance provides a bond between components of the structure and also a degree of filling and surface coverage sufficient to give adequate performance under the extremes of temperature, surface contamination (moisture, dirt, etc.), and mechanical stress expected in service. The impregnant must not flow or deteriorate enough at operating temperature so as to seriously affect performance in service.

Subpart 111.10—Generators

§ 111.10–1 Power requirements.

(a) *Propulsion.* The power for the main propulsion equipment may be derived from a single generator.

(b) *Ship's service.* (1) All ocean vessels using electricity for ship's service power or light shall be provided with at least 2 ship's service generating sets. The capacity of the generating sets shall be sufficient to carry the necessary sea load under normal operation with any 1 generating set in reserve.

(c) *Emergency power and lighting.* See Part 112 of this subchapter for requirements.

§ 111.10–5 Prime movers.

(a) In general, compliance of prime movers with the rules promulgated by the American Bureau of Shipping will be considered as satisfactory evidence of structural and operational efficiency of prime movers.

(b) Special consideration will be given to the structural and operational features of prime movers for small vessels or of unusual design not contemplated by the rules of the American Bureau of Shipping.

§ 111.10–10 Excitation.

(a) *General.* (1) Direct-current rotating exciters shall conform to all the applicable requirements for direct-current generators.

(b) *Propulsion.* Separately excited propulsion generators should be provided with more than one means of excitation. Exciters may be either direct connected or independent generating sets. Current may be derived from the ship's service power or lighting sets.

§ 111.10–15 Generator construction.

(a) *General.* (1) In general, compliance of generators with the rules promulgated by the American Bureau of Shipping will be considered as satisfactory evidence of the structural efficiency of generators.

(2) Special consideration will be given to the construction of generators for small vessels or of unusual design not contemplated by the rules of the American Bureau of Shipping.

(b) *Circulating currents.* Means shall be provided to prevent circulating currents from passing between the journal and the bearing, where the design and arrangement of the machine is such that damaging current may be expected.

(c) *Moisture condensation prevention.* When the weight of the generator excluding the shaft is over 1,000 pounds, it should be provided with means to prevent moisture condensation in the machine when idle. Where steam heating coils are installed for this purpose, there are to be no pipe joints inside the casings.

(d) *Terminal arrangement.* All generator terminals should be protected against accidental contact, mechanical damage, and where necessary, against dripping moisture by drip shields or dripproof enclosures. Where cables enter dripproof enclosures from the sides or top, they should be provided with terminal tubes.

(e) *Nameplates.* (1) All generators shall be fitted with nameplates of corrosion-resistant material marked with the following information:

(i) Manufacturer's type and frame designations;

(ii) Output;

(iii) Kind of rating;

(iv) Temperature rise at rated load;

(v) Design ambient temperature;

(vi) Revolutions per minute at rated load;

(vii) Voltage;

(viii) Amperes at rated load; and,

(ix) Type of windings for d. c. machines.

(2) For a. c. generators, in addition to the applicable parts listed in subparagraph (1) of this paragraph, the following information shall be set forth:

(i) Number of phases;

(ii) Frequency;

(iii) Power factor;

(iv) Exciter voltage; and,

(v) Exciting current in amperes at rating.

(f) *Temperature detectors.* Alternating-current generators of 500 kva and above, when access to coils is difficult, and all alternating-current propulsion generators, should be provided with means for obtaining the temperatures of the stationary windings. The temperature should be indicated at a convenient location, preferably the control panel.

(g) *Ventilation and protection.* (1) Propulsion and ship's service generators not enclosed ventilated shall have all openings protected with substantial wire or mesh screen to prevent personnel injury, and shall be provided with protection against dripping liquids equivalent to that of a drip-proof machine.

(2) Where the protection of the generator is not the equivalent of a protected machine as defined in § 110.15–175 (h) of this subchapter, the arrangement will require specific approval for each installation.

(3) Dampers shall be provided in ventilation air ducts except where recirculating systems are used.

(h) *Fire extinguishing.* Fire extinguishing systems suitable for fires in electrical equipment are to be fitted to propulsion generators which are enclosed or in which the air gap is not directly exposed. See Part 34 of Subchapter D (Tank Vessels), Part 76 of Subchapter H (Passenger Vessels) and Part 95 of Subchapter I (Cargo and Miscellaneous Vessels) of this chapter for details of the systems.

(i) *Insulation of windings.* Armature and field coils should be treated to resist oil and water.

(j) *Lubrication*—(1) *Ship's service generators.* In general, all generators should be located with their shafts in a fore and aft direction on the vessel and they must lubricate and operate satisfactorily when permanently inclined to an angle of 15 degrees athwartship and 5 degrees fore and aft; the bearings are to be so arranged that they will not spill oil under a momentary roll of 30 degrees. Where it is not practicable to mount the generators with armature shafts in the fore and aft direction, their lubrication will require special consideration. Generators depending on forced lubrication, unless otherwise approved, should be provided with means to shut down their prime movers automatically on failure of the lubricating system. Provision is to be made to prevent oil or oil vapor from passing into the machine windings.

(2) *Emergency generators.* For lubrication of emergency diesel-driven generator sets also see Subpart 112.50 of this subchapter.

§ 111.10–20 Voltage regulation.

(a) *Ship's service generator.* (1) Ships service generator's inherent voltage regulation characteristics shall comply in general with all the applicable requirements contained in Table 111.10–20(a)(1):

TABLE 111.10-20 (a) (1)—GENERATOR VOLTAGE REGULATION

Type of generator	Load variation	Voltage variation (maximum)
D. c. shunt or stabilized shunt wound generator	100 percent to 20 percent (decreasing). 20 percent to 100 percent (increasing).	8 percent voltage rise. 12 percent voltage drop.
D. c. compound wound generator and d. c. shunt wound generator with voltage regulator.	20 percent to 100 percent (increasing). 20 percent to 100 percent (increasing). 100 percent to 20 percent (decreasing).	2½ percent. 3 percent from average of ascending and descending curves.
D. c. 3-wire generator (in addition to the above).	Rated current on either positive or negative and 25 percent rated current on neutral and rated voltage positive to negative.	Negative to neutral and positive to neutral 2 percent of rated positive to negative voltage.
A. c. generator and regulator (no reactive droop compensation).	0 percent to 100 percent (increasing). 100 percent to 0 percent (decreasing). (At rated power factor.)	1 percent of rated voltage from a median value halfway between highest and lowest values attained.[1]
Two or more a.-c. generators and regulators with reactive droop compensation adjusted for a voltage droop of not more than 4 percent of rated voltage for a reactive load change from 0 percent to 60 percent of continuous kilovolt-ampere rating.	0 percent to 100 percent (increasing). 100 percent to 0 percent (decreasing). (At rated power factor.)	Not more than 4 percent droop and no point more than 1 percent of rated voltage from the average curve drawn through a plot of settled voltage versus load for any increasing or decreasing load between zero and full load.

[1] May be 2½ percent for emergency generator.

(2) Generators shall, where practicable, be tested with their own driving units. When tested with temporary driving units, allowance shall be made for the expected speed regulation of the driving units to assure satisfactory voltage regulation, as given in Table 111.10–20 (a) (1) after assembly with the permanent driving units.

(3) Where automatic voltage regulators are not supplied the d. c. ship's service generators should be approximately flat compounded except that, if the load fluctuation does not interfere with the operation of vital auxiliaries, shunt wound generators without voltage regulators or stabilized shunt wound machines may be used.

(4) In general a separate regulator should be supplied for each a. c. generator. When it is intended that 2 or more generators will be operated in parallel, reactive droop compensating means should be provided to divide the reactive power properly between the generators. The regulator in conjunction with the exciter and the generator characteristics should be capable of performing in accordance with conditions set forth in this section.

§ 111.10–25 Parallel operation.

(a) In general, when the installation is such that 2 or more generators are to be operated in parallel, the load on any generator should not differ more than plus or minus 15 percent of its rated kilowatt load from its proportionate share, based on the generator ratings, of the combined load for any steady state condition in the combined load between 20 percent and 100 percent of the sum of the rated loads of all generators. The starting point for the determination of the foregoing load distribution requirements should be at 75 percent load with each generator carrying its proportionate share.

§ 111.10–30 Temperature limitations.

(a) Generators shall be designed for an ambient temperature of 50 degrees C. When tested in accordance with American Standard C50, the temperature rises shall not exceed the values given in Tables 111.10–30 (a1) and 111.10–30 (a2). Where provisions are made for insuring an ambient temperature of 40 degrees C. or less, the temperature rises may be 10 degrees C. higher than the values given in the tables.

TABLE 111.10-30 (a1)—LIMITS OF TEMPERATURE RISES FOR DIRECT-CURRENT GENERATORS BASED ON 50° C. AMBIENT TEMPERATURE [1]

Part of generator	Limits of temperature rises—degrees centigrade (measured by thermometer) [2] [3]					
	Class A insulation		Class B insulation		Class H insulation	
	Continuous	At end of 2-hour overload	Continuous	At end of 2-hour overload	Continuous	At end of 2-hour overload
All insulated windings other than items next following	40	55	60	75	80	105
Single-layer field windings with exposed uninsulated surfaces and bare copper windings	50	65	70	85	100	125
Cores and mechanical parts in contact with or adjacent to insulation	40	55	60	75	80	105
Commutator and collector rings	55	65	75	85	95	115
German silver or grid shunts on series field windings	175	----------	175	----------	(3)	----------
Bearings	35	----------	40	----------	(3)	----------

[1] Special consideration shall be given to other parts of the machine such as bearings, etc.
[2] Where other methods are used refer to ASA-C-50 for temperature rise limits.
[3] For Class F insulation refer to NEMA-MG1.

TABLE 111.10-30(a2)—LIMITS OF TEMPERATURE RISES FOR ALTERNATING-CURRENT GENERATORS BASED ON 50° C. AMBIENT TEMPERATURE [1] [2]

Item	Limits of temperature rises, degrees centigrade [3]						
	Determined by—	Salient pole generators			Turbine type generators		
		Class A insulation	Class B insulation	Class H insulation	Class A insulation	Class B insulation	Class H insulation
Armature windings of machines of 1,500 kva. and less.	Thermometer	40	60	100			
Armature windings of machines of 750 kva. and less.	do				40	60	100
Armature windings with 2 coil sides per slot in stators of machines above 1,500 kva.	Imbedded detector	50	70	110			
Armature windings with 2 coil sides per slot in stators of machines above 750 kva.	do				50	70	110
Insulated field windings	Resistance	50	70	110		80	120
Collector rings	Thermometer	55	75	115	55	75	115
Cores and mechanical parts in contact with or adjacent to insulation.	do	40	60	100	40	60	100
Bearings	do	35	40	(3)	35	40	(3)

[1] For generators having 25 percent overload rating for 2 hours, the temperature at the end of the overload run when conducted immediately following the continuous run shall not exceed the figures in the table by more than 15° C. except for collector rings which shall be in accordance with the table.
[2] Special consideration shall be given to other parts of the machine such as bearings, etc.
[3] For Class F insulation, refer to NEMA-MG1.

§ 111.10–35 Dielectric strength of insulation.

Generators shall be capable of withstanding without damage a dielectric test in accordance with American Standard C50.

§ 111.10–40 Tests.

(a) Sufficient tests should be made by the manufacturer to insure that the machine is in accordance with these regulations.

Subpart 111.15—Storage Batteries

§ 111.15–1 General requirements.

(a) *Power and light batteries.* Power and lighting batteries may be of the lead acid or alkaline type, or any other approved type, due consideration being given to suitability for any specific application. The cells shall be constructed so as to prevent spilling of electrolyte due to an inclination of 40° from the normal.

(b) *Emergency and general alarm storage batteries.* When batteries are used for emergency lighting and power loads or for general alarm system loads, the requirements of Part 112 of this subchapter are also applicable.

(c) *Categories.* Batteries shall be classified into three types depending upon power output of the battery charger.

(1) *Large.* Large batteries shall be considered those connected to a battery charger whose output is more than 2 kw. (calculated from the maximum obtainable charging current and the normal voltage of the battery).

(2) *Moderate.* Moderate batteries shall be considered those connected to a battery charger whose output is between 0.2 kw. and 2 kw. (calculated from the maximum obtainable charging current and the normal voltage of the battery).

(3) *Small.* Small size batteries shall be considered those connected to a battery charger whose output is less than 0.2 kw. (calculated from the maximum obtainable charging current and the normal voltage of the battery).

(d) *Nameplates.* Each tray shall be provided with a durable nameplate securely attached, bearing the manufacturer's name or trade mark and type designation, the ampere-hour rating at a specific rate of discharge, and the specific gravity of the electrolyte (for a lead acid battery when fully charged). Data molded on the tray case will be acceptable in lieu of a nameplate.

§ 111.15–5 Battery installation.

(a) *Large storage batteries.* Large batteries should be installed in a room assigned to batteries only, but may be installed in a box on deck if a room is not available. Lighting equipment installed in a battery room shall be explosion proof suitable for Class I, Group D, locations. Devices liable to arc, such as switches, battery chargers, etc. shall not be installed in battery rooms. The overload protective device required by § 111.15–25 should be placed in each conductor adjacent to but outside the room. Electric cables other than those serving the battery or battery room lighting should be routed around rather than through the battery room.

(1) A "danger notice" shall be permanently secured to the doors of the battery room or to the covers of battery deck boxes indicating that a naked light or smoking in these rooms or in this vicinity is prohibited.

(b) *Batteries of moderate size.* Batteries of moderate size as described in § 111.15–1(c)(2) should preferably be installed in a battery room or in a box on deck, but may also be installed in a box or locker in some suitable space such as an engineroom, storeroom, etc., or may be installed open if protected from above from falling objects in the engineroom or in a similar well-ventilated compartment. Batteries should not be installed in sleeping spaces. Engine cranking batteries should be located as closely as possible to the engine or engines served.

(c) *Batteries of small size.* Batteries of small size as described in § 111.15–1(c)(3) may be installed in such places as open working spaces and boat engine compartments provided that the space is ventilated.

§ 111.15–6 Arrangement.

(a) *Battery trays.* Battery trays should be chocked with wood strips or equivalent to prevent movement and each tray should be fitted with nonabsorbent insulating supports on the bottom and with similar spacer blocks at the sides or with equivalent provisions to secure air circulation space all around each tray. Battery trays should be so arranged that the trays are accessible and with not less than 10 inches head room.

(b) *Tiers.* When batteries are arranged in two or more tiers, all shelves should have not less than 2 inches space front and back for circulation of air.

§ 111.15–10 Ventilation.

(a) *General.* All rooms, lockers, and boxes for storage batteries should be arranged or ventilated to avoid accumulation of flammable gas.

(b) *Battery rooms.* Natural ventilation may be employed if ducts can be run directly from the top of the room to the open air above with no part of the duct more than 45° from the vertical. These ducts should not contain appliances (e.g., flame arrestors) which may impede the free passage of air or gas mixtures. Rooms containing large battery banks as defined in § 111.15–1(c)(1) shall be ventilated by mechanical exhaust. When mechanical exhaust is required, the system shall be separate from ventilation systems for other spaces, and, if electric, the motor shall be located outside the battery room. Mechanical ventilation systems shall be interlocked with the battery charger so that the battery cannot be charged without ventilation. Adequate openings, whether connected to ducts or not, for air inlet shall be provided near the floor or the bottom of lockers or boxes. In every case the quantity of the air expelled should be at least equal to:

$$(q=3.89in) \qquad (1)$$

where:
q = quantity of expelled air in cubic feet per hour.
i = maximum charging current during gas formation, however at least one-fourth of the maximum obtainable charging current of the charging facility.
n = number of cells.

(c) *Battery lockers.* Battery lockers should be ventilated, if practicable, similarly to battery rooms by a duct led from the top of the locker to the open air or to an exhaust ventilation duct, but the duct may terminate not less than 3 feet above the top of the locker in machinery spaces and similar well-ventilated compartments. Louvers or equivalent should be provided near the bottom for entrance of air.

(d) *Deck boxes.* Deck boxes should be provided with a duct from the top of the box terminating at least 4 feet above in a gooseneck, mushroom head, or equivalent to prevent entrance of water. Holes for air inlet should be provided on at least two opposite sides of the box.

The entire deck box, including openings for ventilation, should be weathertight to prevent entrance of spray or rain.

(e) *Boxes for small batteries.* Boxes for small batteries require no ventilation other than openings near the top to permit escape of gas.

§ 111.15–15 Protection from corrosion.

(a) Shelves in battery rooms or lockers for acid batteries should have a watertight lining of sheet lead of 1/16-inch thickness carried up not less than 3 inches on all sides. For alkaline batteries the shelves should be similarly lined with steel not less than 1/32-inch thick. Alternatively, a battery room may be fitted with a watertight lead pan for acid batteries, steel for alkaline batteries, over the entire deck, carried up not less than 6 inches on all sides. Deck boxes should be lined in accordance with the above alternative method. Boxes for small batteries should be lined to a depth of 3 inches consistent with the methods described above.

(b) Alternate lining materials may be used in lieu of lead or steel if it can be established that the material is corrosion-resistant to the specified electrolyte used in the batteries.

§ 111.15–20 Conductors.

When conductors enter battery rooms the holes shall be made watertight. All connections within battery rooms shall be resistant to the electrolyte. Cables shall be sealed to resist the entrance of electrolyte by spray or creepage. The size of the connecting cable is to be based on current carrying capacities given in Table 111.60–1(e)(1)(i) and the starting rate of charge or maximum discharge rate, whichever is the greater, shall be taken into consideration in determining the cable size.

§ 111.15–25 Overload and reverse current protection.

(a) An overload protective device shall be placed in each battery conductor, except that engine cranking batteries and batteries with a nominal potential of 6 volts or less need not be protected against overload. For location of overcurrent devices with regard to battery rooms, see § 111.15–5(a).

(b) The charging equipment (except when a rectifier is employed) for all batteries with a nominal voltage more than 20 percent of line voltage shall provide automatic protection against reversal of current.

Subpart 111.20—Transformers

§ 111.20–1 General requirements.

(a) All transformer windings should be treated to resist moisture, sea atmosphere, and oil vapors.

§ 111.20–5 Temperature rise.

(a) The temperature rise, based on an ambient temperature of 40° C., shall not exceed the following:

Class A insulation: 55° C.
Class B insulation: 80° C.
Class H insulation: 150° C.

(b) If the ambient temperature exceeds 40 degrees C. the transformer shall be derated so that the total temperature given in this section is not exceeded. Temperatures are to be taken by the resistance method of temperature determination.

Subpart 111.25—Motors

§ 111.25–1 General requirements.

(a) The requirements for generators contained in § 111.10–15 (a), (b), (c), (f), (g), (h), (i) and (j) are also applicable to motors, except that § 111.10–15 (c), (f) and (h) are applicable to propulsion motors only.

§ 111.25–5 Nameplates.

(a) All motors shall be fitted with nameplates of corrosion-resistant material. The nameplates shall be marked with the following information:

(1) Manufacturer's type and frame designation;
(2) Output (hp.);
(3) Kind of rating;
(4) Design ambient temperature;
(5) Temperature rise at rated load;
(6) Revolutions per minute at rated load;
(7) Voltage;
(8) Amperes at rated load; and,
(9) Type of winding (for d. c. machines).

(b) For alternating-current motors, in addition to the applicable parts listed in paragraph (a) of this section, the nameplates shall be marked with the following information:

(1) Number of phases;
(2) Frequency;
(3) Power factor (synchronous motors only);
(4) Exciter voltage (synchronous motors only);
(5) Exciter current (synchronous motors only);
(6) Secondary voltage (polyphase wound-rotor induction motors only);
(7) Secondary amperes at rated load (polyphase wound rotor induction motors only);

(8) For motors rated at 1/2 horsepower or larger, except a polyphase wound-rotor motor, a code letter to show its input in kilovolt-amperes with locked rotor selected from Table 111.25–5 (b)(8); and

(9) For multi-speed motors, amperes at rated load for each winding or winding connection.

TABLE 111.25–5(b)(8)—LOCKED ROTOR INDICATING CODE LETTERS

Code letter	KVA per hp. with locked rotor
A	0 – 3.14
B	3.15– 3.54
C	3.55– 3.99
D	4.0 – 4.49
E	4.5 – 4.99
F	5.0 – 5.59
G	5.6 – 6.29
H	6.3 – 7.09
J	7.1 – 7.99
K	8.0 – 8.99
L	9.0 – 9.99
M	10.0 –11.19
N	11.2 –12.49
P	12.5 –13.99
R	14.0 –15.99
S	16.0 –17.99
T	18.0 –19.99
U	20.0 –22.39
V	22.4 –and up

(c) For nonvital motors, such as winch motors, refrigeration motors, water cooler motors, galley appliance motors, etc., nameplates with standard commercial markings will be acceptable. Nameplates for motors located in corrosive locations shall be made of corrosion-resistant material.

§ 111.25–10 Temperature limitations.

(a) Motors for use in the engine room or boiler room shall be designed for an ambient temperature of 50 degrees C. Motors for use in locations where the ambient temperature will not exceed 40 degrees C may be designed for an ambient temperature of 40 degrees C. Motors, when tested in accordance with American Standard C50, shall not exceed the limits of temperature rises given in Tables 111.25–10 (a1) and (a2).

TABLE 111.25–10(a1)—LIMITS OF TEMPERATURE RISES FOR DIRECT-CURRENT MOTORS[1]

Part of motor and type of enclosure	Limits of temperature rises; degrees centigrade (thermometer method)[2][3]					
	Class A insulation		Class B insulation		Class H insulation	
	40° C. ambient temperature	50° C. ambient temperature	40° C. ambient temperature	50° C. ambient temperature	40° C. ambient temperature	50° C. ambient temperature
All insulated windings other than item next following:						
Open and semienclosed	50	40	70	60	110	100
Totally enclosed	55	45	75	65	115	105
Single-layer field windings with exposed uninsulated surfaces and bare copper windings:						
Open and semienclosed	60	50	80	70	130	120
Totally enclosed	65	55	85	75	135	125
Cores and mechanical parts in contact with or adjacent to insulation:						
Open and semienclosed	50	40	70	60	110	100
Totally enclosed	55	45	75	65		
Commutators and collector rings:						
All types	65	55	85	75	125	115
Bearings:						
Open and semienclosed	40	35	45	40	(3)	(3)
Totally enclosed	45	40	50	45	(3)	(3)

[1] Special consideration shall be given to other parts of the machine, such as bearings, etc.
[2] Where other methods are used refer to ASA–C–50 for temperature rise limits.
[3] For Class F insulation refer to NEMA–MG1.

TABLE 111.25-20(a2)—LIMITS OF TEMPERATURE RISES FOR ALTERNATING-CURRENT MOTORS [1]

Part of motor and type of enclosure	Limits of temperature rises; degrees centigrade (thermometer method) [2] [4]					
	Class A insulation		Class B insulation		Class H insulation	
	40° C. ambient temperature	50° C. ambient temperature	40° C. ambient temperature	50° C. ambient temperature	40° C. ambient temperature	50° C. ambient temperature
Coil windings, cores and mechanical parts in contact with, or adjacent to insulation:						
All except totally enclosed	50	40	70	60	110	100
Totally enclosed	55	45	75	65	115	105
Collector rings, commutators (the class of insulation refers to insulation affected by the heat from the commutator or collector rings, which insulation is employed in the construction of the commutator or collector rings or is adjacent thereto):						
All types	65	55	85	75	125	115
Bearings:						
Open and semienclosed	40	35	45	40	(3)	(3)
Totally enclosed	45	40	50	45	(3)	(3)

[1] Squirrel-cage windings and mechanical parts not in contact with or adjacent to insulation may reach such temperatures as will not be injurious in any respect.
[2] Special consideration shall be given to other parts of the machine, such as bearings, etc.
[3] Where other methods are used refer to ASA-C-50 for temperature rise limits.
[4] For Class F insulation refer to NEMA-MG1.

§ 111.25-15 Duty cycle.

(a) Motors shall be rated for continuous duty, except that motors for the applications listed in Table 111.25-15(a) may be short-time rated motors as indicated. Any other motors of similar duty may have consistent short-time ratings.

TABLE 111.25-15 (a)

Application of motor	Minimum short time rating of motor in hour
Deck winch and direct acting capstan.	½.
Deck winch with hydraulic transmission.	Continuous at no load, followed by ½ hour at full load.
Direct acting windlass	¾.
Windlass with hydraulic transmission.	½ hour idle pump operation followed by ¾ hour full load operation.
Steering gear, direct acting	1.
Steering gear, indirect drive.	Continuous operation at 15 percent load followed by 1 hour at full load.
Watertight door operators	½a.
Lifeboat winches	½a.

§ 111.25-20 Dielectric strength of insulation.

(a) Motors shall be capable of withstanding without damage a dielectric test in accordance with American Standard C50.

§ 111.25-25 Terminal arrangement.

(a) All motors shall be provided with terminal leads in terminal boxes secured to the frames. Terminal boxes shall be drip-proof or watertight, consistent with the motor enclosure. The ends of motor terminal leads shall be fitted with connectors. As an alternate to this arrangement, the frames of motors may be fitted with terminal tubes through which the cable shall pass to suitable terminals inside the frame.

§ 111.25-30 Enclosure and protection.

(a) *General.* Motors for use in the engineroom or spaces where subject to mechanical injury, or dripping of oil or water, shall be either of the waterproof or dripproof protected type, or they may be of the open type if protected in accordance with § 111.10-15(g). Care shall be exercised in locating motors high enough to avoid bilge water. Motors shall not be located beneath and covered by the floorplates unless otherwise approved by the Commandant.

(b) *Pump motors.* Motors for operating plunger and close coupled pumps should have the driving end entirely enclosed or designed to prevent leakage from entering the motor.

(c) *Motors for use on weather decks.* Motors for use on weather decks shall be of the waterproof type or shall be enclosed in waterproof housings, drained as described in § 110.15-175(k) of this subchapter.

(d) *Motors installed below decks.* Motors installed below decks should be located in as dry a place as practicable and proximity to steam, water and oil piping should be avoided.

(e) *Motors for hazardous locations.* Motors for use in hazardous locations shall comply with the requirements of § 111.60-40.

§ 111.25-35 Current ratings.

(a) For continuous duty motors, the current values given in the Table 111.25-35(a) shall be used for the purpose of determining the current-carrying capacity of conductors, switches, branch-circuit overcurrent devices, etc., in lieu of the actual current ratings marked on the motor nameplate. For multi-speed motors, for motors of unusual speeds, and for other than continuous duty motors, the nameplate current values shall be used. The motor-running overcurrent protection shall be based on the motor nameplate current rating or ratings.

TABLE 111.25-35 (a)—APPROXIMATE FULL-LOAD CURRENTS OF CONTINUOUS DUTY MOTORS [1]

Motor horsepower	Full-load current—amperes					
	D. c. motors		3-phase, a. c. induction motors			
			Squirrel-cage		Wound-rotor	
	115 volts	230 volts	220 volts	440 volts	220 volts	440 volts
¼	2.0	1.0	0.99	0.45		
½	2.6	1.3	1.16	.58		
¾	3.2	1.6	1.4	.70		
1	4.5	2.3	1.9	.95		
1½	6.5	3.3	2.6	1.3		
2	8.5	4.3	3.4	1.7	5.4	2.7
3	12.5	5.3				
3½	12.5	6.3	5.0	2.5	6.8	3.4
5	14.5	7.3	5.8	2.9	7.2	3.6
7½	16.3	8.3	6.3	3.1	8.0	4.0
10	20.5	10.3	7.6	3.8	8.8	4.4
15	23	12.3	9.0	4.5	10.5	5.3
20	31	16.0				
25	40	19.8	14.5	7.2	16	8.0
30	47	23.4	17.2	8.6	18	9
40	56	28.7	21	10.5	23	11.5
50	69	34.3	24.5	12.4	26	13
60	75	38	26	13.5	29	14.5
75	93	47	34	17	36	18
100	112	56	40	20	42	21
125	131	65	46	23	48	24
150	150	74	52	26	54	27
200	187	83	58	29	60	30
225	185	92	65	32	68	34
250	202	101	70	35	72	36
300	220	110	78	39	80	40
350	237	128	92	46	94	47
400	294	146	102	51	104	52
450	329	163	116	58	116	58
500	364	180	126	63	128	64
600	432	215	152	76	154	77
750		265	188	94	188	94
1000		353	250	125	250	125
1250		441	310	155	310	155
1500		535	370	185	370	185
2000		720	490	245	490	245

[1] Table 111.25-35 (a) gives values that are approximate, and typical only of motors for usual speeds and frequencies. For low speed and special motors, the full-load currents are somewhat higher than the values shown. For this reason, the values shown should be used only for estimating purposes and the selection of cable. They should not be used in the selection of overload relay heaters and coils.

Subpart 111.30—Electric Couplings for Propulsion

§ 111.30–1 General requirements.

(a) *Enclosure and ventilation.* Electrical couplings shall be enclosed and ventilated as required for generators. All windings shall be specially treated to resist moisture, oil and salt air.

(b) *Accessibility for repairs.* The couplings should be designed to permit removal as a unit without moving the engine.

(c) *Excitation.* Excitation should be provided as for propulsion generators and motors.

(d) *Nameplates.* All electric propulsion couplings shall be fitted with nameplates of corrosion-resistant material. The nameplates shall be marked with the following information:

(1) Manufacturer's type and frame designation;
(2) Output (hp.);
(3) Kind of rating;
(4) Design ambient temperature;
(5) Temperature rise at rated load;
(6) Revolutions per minute at rated load;
(7) Voltage;
(8) Exciter voltage; and,
(9) Exciting current in amperes at rated load.

(e) *Temperature limitations.* The limits of temperature rise should be the same as for alternating-current generators, except that when a squirrel cage element is used the temperature of this element may reach such values as are not injurious. Depending upon the cooling arrangements the maximum temperature rise may occur at other than full load rating so that heat runs will require special consideration; for this purpose, when an integral fan is fitted the coupling temperatures should not exceed these limits when operated continuously at 70 percent of full load rpm., full excitation and rated torque.

Subpart 111.35—Switchboards and Propulsion Controls

§ 111.35–1 General requirements.

(a) *General.* Controlling appliances for propulsion and ship's service equipment should include the apparatus necessary for starting, stopping, reversing and controlling the speed of motors, together with essential safety devices. All wearing parts are to be readily renewable.

(b) *Switchboard installation and location.* Switchboards shall be installed in as dry a place as possible and shall be accessible from the front and rear. Switchboards shall be secured to a solid foundation, shall clear deck beams by at least 4 inches, and shall be either self-supported or braced to the bulkhead or deck above. In case the latter method is used, means of bracing shall be flexible to allow deflection of the ship's structure without buckling the control cell or assembly structure. Unless otherwise specifically approved, a clear working space of not less than 36 inches shall be provided in front of switchboards and a working space of not less than the values shown in Table 111.35–1(b) shall be provided in the rear of switchboards. In a passenger ship where there is only one main generating station, the main switchboard shall be located in the same main fire zone.

TABLE 111.35–1 (b)—WORKING SPACE IN REAR OF SWITCHBOARDS

Potential between phases or conductors of opposite polarity	Switchboard width	Clear working space in rear of switchboard in inches	
		Accessible from one end only	Accessible from both ends
250 volts or less	Single panel not exceeding 42 inches in width	[1] 24	18
	More than one panel or single panel exceeding 42 inches in width	[1] 30	24
Over 250 volts but less than 600 volts.	Single panel not exceeding 42 inches in width	[1] 30	24
	More than one panel or single panel exceeding 42 inches in width.	[1] 36	30
600 volts or over	Any width	[1] 38	[1] 38

[1] May be reduced not more than 6 inches in way of stiffeners and frame or by equipment on a single panel in the switchboard.

(c) *Switchboard mechanical protection.* The sides of switchboards shall be enclosed and the space in the rear of switchboards made inaccessible to other than qualified persons. Non-conducting mats or gratings shall be provided on deck in the front and rear of switchboards. Non-conducting hand rails at the front and non-conducting guard rails at the rear shall be provided. Each switchboard shall have a drip-cover over the top. Hinged panels of dead front switchboards shall be provided with positioners and stops.

(d) *Switchboard construction.* Panels should be made of impregnated ebony asbestos, laminated phenolic material, or the equivalent. They may be made of metal if the live parts mounted thereon are properly insulated. The supporting framework for all panels is to be of rigid construction. No wood should be used in the construction of switchboards except that hardwood or nonconducting hand rails and guard rails shall be provided for the protection of personnel from live parts.

(e) *Dead front type switchboard.* Dead front type switchboards shall be used where the voltage between poles or to ground is above 250 volts direct current or 55 volts alternating current.

(f) *Corrosion-resistant parts.* Parts of switchboards and control assemblies liable to damage by corrosion should be made of noncorrodible-material or of material made corrosion resistant.

(g) *Mechanical strength of working parts.* All levers, handles, hand wheels, interlocks and their connecting links, shafts and bearings for the operation of switches and contactors should be of such proportions that they will not be broken or distorted by manual operation.

(h) *Nameplates.* Nameplates shall be provided for each piece of apparatus to indicate clearly its service. Nameplates for feeders and branch circuits shall include the circuit designation, description of the load served, and the rating or setting of the overcurrent protective device.

(i) *Protection of instrument circuits.* Except as otherwise provided in this paragraph, instruments, pilot lights, ground detector lights, potential transformers, and other switchboard devices shall be supplied by circuits protected by overcurrent devices.

(1) Circuits, the opening of which would create a hazard in the operation of the vessel, shall not be protected against overcurrent. Such circuits will usually include electric propulsion control circuits, voltage regulator supply circuits, and ship's service generator circuit breaker tripping control circuits.

(j) *Grounding of instruments, relays, meters, and instrument transformers.* Metal cases of instruments, relays, meters, and instrument transformers and the secondary windings of instrument transformers located on switchboards shall be grounded.

§ 111.35–5 Switchboard bus bars and wiring.

(a) *General.* Buses shall be designed on the basis of generator capacity and feeder loads. For a single generator, the generator bus shall have a capacity not less than the continuous rating of the generator plus any overload rating in excess of 30 minutes' duration. For more than one generator with all generating capacity feeding through one section of the bus, the capacity of the bus for the first generator shall be the same as for a single generator. For each subsequent generator the bus capacity shall be increased by 80 percent of the continuous rating of each added generator. The capacity of connection buses for each generator unit shall be not less than the continuous rating of the generator plus any overload rating in excess of 30 minutes' duration. All other bus bars and bus connections shall be designed for at least 75 percent of the combined full-load rated currents of all apparatus they supply, plus not less than 50 percent of the combined ratings of the spare switches or circuit breaker elements connected to the bus, except that when feeders supply one unit or any group of units in continuous operation they shall be designed for full load, and except that the capacity of feeder buses need not be greater than the generators buses that supply them.

(b) *Bus bar rating.* Bus bar sizes shall be not less than that indicated for the ampere ratings in Table 32 (Appendix) of AIEE Standard No. 45.

(c) *Arrangement of bus bars and wiring.* The arrangement of bus bars and wiring on the back of switchboards shall be such that all lugs are readily accessible. Soldering lugs, where used, should have a solder contact length at least 1½ times the diameter of the conductor and all nuts and connections should be fitted with locking devices to prevent loosening due to vibration.

(d) *Spacing.* Except at switching mechanisms, contactors, pilot lights, and similar switchboard mounted equipment, the spacings in a switchboard shall be not less than those indicated in Table 111.35–5 (d). Spacings at switchboard mechanisms, contactors, pilot lights, and similar switchboard mounted equipment shall conform to the requirements for the respective equipment as required by this subchapter.

TABLE 111.35-5 (d)—SWITCHBOARD SPACINGS

Voltage involved	Minimum spacing in inches between live parts of opposite polarity		Minimum spacing in inches through air or over surfaces between uninsulated live-metal parts and grounded dead metal
	Over surface	Through air	
125 or less	¾	½	½
126 through 250	1¼	¾	½
251 through 600	2	1	1

(e) *Switchboard wiring.* Instrument and control wiring should be of the stranded type not smaller than 4000 CM and should have flame-retarding insulation. Wiring from hinged panels should be of the extra flexible type.

§ 111.35–10 Switchboard mounted equipment.

(a) *General.* Air circuit breaker contacts shall be kept at least 12 inches from the ship's structure unless insulation barriers are installed. For live front switchboards the clearance between current-carrying parts and base channel shall not be less than 4 inches. Voltage regulator element shall be totally enclosed. Where rheostats or other devices that may operate at high temperatures are mounted on the switchboard, they shall be naturally ventilated and so isolated by barriers as to prevent excessive temperature of copper or adjacent devices. When this cannot be accomplished the rheostat or other device shall be mounted separate from the switchboard. In general, all fuses, except for instrument and control circuits, shall be mounted on or be accessible from the front of the switchboard. All wiring on the back of boards for voltmeter, pilot and ground lamps shall be protected by fuses.

(b) *Equipment.* Contactors, relays, switches, circuit breakers, etc., shall conform to the applicable requirements of such devices given in this subchapter.

(c) *Connections.* The connections between a direct-current generator and the bus bars shall be in accordance with Figures 1 to 10, inclusive, appendix, AIEE Standard No. 45. Other connections not less effective will be considered.

§ 111.35–15 Ship's service generator and distribution switchboards.

(a) *General.* Ship's service generator and distribution switchboards must provide adequate control of the generation and distribution of electric power.

(b) *Equipment for direct-current switchboards.* For direct-current switchboards, in addition to equipment required by paragraph (a) of this section, there shall be provided at least the equipment listed in this paragraph.

(1) An unfused generator switch or links which will completely disconnect the generator and its circuit breaker from the bus, except when the generator circuit breaker is of the draw-out type.

(2) For two-wire machines, an ammeter for each generator and, for three-wire machines, an ammeter for each positive and negative lead and a center zero ammeter in the ground connection at the generator switchboard. Ammeters shall be so located in the circuit as to indicate total generator current.

(3) For each two-wire generator, a voltmeter with voltmeter switch for connecting the voltmeter to indicate generator voltage and bus voltage. Where a shore connection is installed, one of these voltmeter switches shall also provide for reading shore connection voltage.

(4) For each three-wire generator, a voltmeter with voltmeter switch for connecting the voltmeter to indicate generator voltage, positive to negative, and bus voltage positive to negative, positive to neutral, and neutral to negative. Where a shore connection is installed, one of these voltmeter switches shall provide also for reading shore connection voltage, positive to negative, positive to neutral, and neutral to negative.

(5) A field rheostat for each generator.

(6) A pilot lamp for each generator connected between generator and circuit breaker.

(7) Adequate means for ground detection shall be provided on the ship's service generator and distribution switchboard for the following systems: ship's main power system, ship's main lighting system, and ship's emergency lighting system. When the ground detection means for these systems are ground lamps, a normally closed spring-return-to-normal switch shall be provided in the ground connection.

(8) A circuit breaker or fused switch for each shore power feeder installed, with a pilot light connected to the shore side thereof.

(c) *Equipment for alternating-current switchboards.* For alternating-current switchboards, in addition to the equipment required by paragraph (a) of this section, there shall be provided at least the equipment listed in this paragraph.

(1) An unfused generator switch or links which will completely disconnect the generator and its circuit breaker from the bus, except when the generator circuit breaker is of the draw-out type.

(2) An ammeter for each generator with a selector switch to read the current of each phase.

(3) A voltmeter for each generator with voltmeter switch for connecting the voltmeter to read generator voltage of each phase and bus voltage of 1 phase; where a shore connection is installed, one of these voltmeter switches shall provide also for reading voltage of each phase of the shore connection.

(4) A synchroscope and synchronizing lamps with selector switch to provide for paralleling in any combination.

(5) Control for prime mover speed for paralleling.

(6) An indicating watt-meter for each generator arranged for parallel operation.

(7) A frequency meter with selector switch to connect to any generator.

(8) A field rheostat for each generator and each exciter.

(9) A double-pole field switch with discharge clips and resistor for each generator.

NOTE. For generators with variable voltage exciters or rotary amplifier exciters, each controlled by a voltage regulator unit acting on the exciter field, the field switch, the discharge resistor and the generator field rheostat may be omitted.

(10) A pilot lamp for each generator connected between generator and circuit breaker.

(11) A voltage regulator complete with all accessories, including a voltage regulator functional cut-out switch.

(12) Adequate means for ground detection. For details see paragraph (b) (7) of this section.

(13) A circuit breaker or fused switch for each shore power feeder installed, with a pilot light connected to the shore side thereof.

§ 111.35–20 Emergency and interior communication switchboards.

Emergency and interior communication switchboards, when fitted, shall comply with the applicable provisions of Subpart 111.35 and of Part 112 of this subchapter.

§ 111.35–25 Electric propulsion control.

(a) *General.* The arrangement of bus bars and wiring on the back of propulsion control assemblies should be such that all parts, including the connections, are accessible. Adequate clearance should be provided between parts of opposite polarity and between live parts and ground to prevent arcing. All nuts and connections should be fitted with locking devices to prevent loosening due to vibration.

(b) *Prime mover control.* Where required by the system of control, means should be provided at the control assembly for controlling the prime mover speed and for mechanically tripping the throttle valve.

(c) *Protection.* The control assembly should be protected at the sides and back by a wire mesh, expanded metal grill, or other means if a bulkhead does not perform this function. The access doors to high voltage compartments should be interlocked to prevent opening unless the main generator field circuit is deenergized. A warning plate giving the maximum voltage inside the enclosure should

be provided on all doors entering the enclosure. Where steam and oil gages are mounted on the main control assembly, provision should be made so that the steam or oil will not come in contact with the energized parts in case of leakage.

(d) *Switches.* All switches are to be arranged for manual operation and so designed that they will not open under ordinary shock or vibration; contactors, however, may be operated pneumatically, by solenoids, or by other means in addition to the manual method which should be provided unless otherwise approved. Generator and motor switches should preferably be of the air-break type but for alternating-current systems, where they should be designed to open full load current at full voltage, oil break switches using non-flammable liquid may be used if provided with leakproof non-spilling tanks. Where necessary, field switches should be arranged for discharge resistors, unless discharge resistors are permanently connected across the field. For alternating-current systems, means should be provided for deenergizing the excitation circuits by the unbalance relay and ground relay.

(e) *Interlocks.* All levers for operating contactors, line switches, field switches and similar devices should be interlocked to prevent their improper operation. Interlocks should be provided with the field lever to prevent the opening of any main circuits without first reducing the field excitation to zero, except that when the generators simultaneously supply power to an auxiliary load apart from the propulsion, the field excitation need only be reduced to a low value.

(f) *Instruments and markings.* The necessary instruments to indicate existing conditions at all times are to be provided and mounted on the control panel convenient to the operating levers and switches. Instruments and other devices mounted on the switchboard are to be plainly labeled and the instruments provided with a distinguishing mark to indicate full load conditions. Metallic cases of all permanently installed instruments and the secondary windings of instrument transformers shall be permanently grounded.

(g) *Locations.* Either wheelhouse or engine room control may be used; however, when wheelhouse control is used an arrangement shall be provided whereby the propulsion equipment can also be controlled from the engine room, except when otherwise approved for small vessels for limited service. When the equipment is arranged for control from two or more stations, a selector switch shall be provided for connecting the control circuit to the delegated station controller. This selector switch shall be interlocked to prevent transfer of the control without removing power and to prevent restarting from the incoming control station until the control is first returned to the "Off" position.

(h) *Indicators.* (1) When two or more control stations are provided, indicating lights should be located at each control to show the station which is in control.

(2) When two or more control stations are provided, additional indicating lights should be located at each control station, except at the engine room control, to show whether the field circuits are energized or deenergized.

(3) A propeller shaft speed indicator should also be provided at each control station.

(i) *Multiple units.* Systems having two or more propulsion generators or two or more motors on one propeller shaft should be so arranged that any unit may be cut out of service without preventing the operation of the remaining units.

(j) *Ground detection and protection from electrical faults.* Ground detection together with means of protecting the propulsion generators and motors from electrical faults should be provided. For alternating-current systems, the grounding arrangement of the generator neutral should limit the current at full load voltage to not more than 20 amperes upon a fault to ground in the propulsion system. Phase unbalance and ground relays should be provided which will open the generator and motor field circuits upon the occurrence of a fault. For direct-current systems the ground detector may consist of a voltmeter or lights. Provision should be made for protection against severe overloads, excessive currents, and electrical faults likely to result in damage to the plant. Protective equipment should be capable of being so set as not to operate on the overloads or overcurrents experienced in a heavy seaway or when maneuvering.

(k) *Features for other services.* If the propulsion generator is used for other purposes than for propulsion, such as dredging, cargo oil pumps, and other special services, overload protection in the auxiliary circuit and means for making voltage adjustments should be provided at the control board. When propulsion alternating-current generators are used for other services for operation in port, the port excitation control should be provided with a device that should operate just below normal idling speed of the generator to automatically remove excitation.

(l) *Electric coupling control equipment.* Electric coupling control equipment should be combined with the prime mover speed and reversing control and should include a two-pole disconnect switch, short circuit protection only, ammeter for reading coupling current, discharge resistor and interlocking to prevent energizing the coupling when the prime mover control levers are in an inappropriate position.

§ 111.35–30 Tests for switchboards and propulsion controls.

(a) Switchboards and propulsion control apparatus shall be capable of meeting the test requirements of section 35, American Bureau of Shipping Rules for the Classification and Construction of Steel Vessels.

Subpart 111.40—Distribution Panelboards (Switchboard and Panelboard Types)

§ 111.40–1 General requirements.

(a) *Location.* Panelboards should be located in accessible positions and not in such spaces as bunkers, storerooms, cargo holds, compartments allotted alternately to passengers or cargo or locations exposed to the weather.

(b) *Enclosure.* The enclosure of distribution panelboards shall be as follows:

(1) *Switchboard type.* Distribution panels of the switchboard type, unless installed in machinery spaces or in compartments assigned exclusively to electric equipment and accessible only to qualified personnel, shall be completely enclosed or otherwise protected against accidental contact and unauthorized operation.

(2) *Panelboard type.* Panelboards not exposed to moisture, and particularly flush mounted panelboards in way of joiner work in passenger and crew accommodations and public spaces, may be of nonwatertight construction. Elsewhere panelboards generally shall be of drip-proof construction.

(3) *Watertight panelboards.* Where panelboards must be located where a watertight enclosure is necessary, the switches shall be externally operative.

(c) *Locking.* The cabinet or enclosing case of panelboards shall be locked closed where accessible to passengers.

(d) *Safety type.* Panelboards for the control of lighting circuits and panelboards containing voltages to ground in excess of 150 volts shall be of the safety type.

(e) *Construction.* Switchboard type panelboards shall conform to the applicable requirements of Subpart 111.35, except that units constructed to be completely serviced from the front need not be accessible from the rear. Unspecified panelboard construction details shall conform with the requirements of Underwriters' Laboratories, Inc., Standard for Panelboards.

(f) *Switching devices.* Panelboards for distribution to motors, appliances, lighting or other branch circuits, except general alarm circuits, shall be fitted with multipole switches or circuit breakers having a pole for each conductor. Overcurrent protection shall be provided for each ungrounded conductor of feeders and each conductor of branch circuits. For setting of overcurrent devices see Subpart 111.55. The rating of the disconnecting device shall be coordinated with the voltage and current requirements of the load, and in no case less than 30 amperes.

(g) *Overcurrent protection of and number of overcurrent devices on one panelboard.* Not more than 60 overcurrent devices of a lighting or appliance branch circuit panelboard shall be installed in any one cabinet. Panelboards supplying lighting and appliance branch circuits and panelboards having switching devices rated at 50 amperes or less shall have overcurrent protection not in excess of 200 amperes.

(h) *Relative arrangement of switches and fuses.* Panelboards having switches on the load side of any type of fuses shall not be installed.

(i) *Directory.* Panelboard switching units shall be numbered and the panelboard provided with a circuit directory card and card holder. After installation the directory card shall be marked for each circuit with the circuit designation, description of load served, and the rating or setting of the appropriate overcurrent protective device.

Subpart 111.45—Motor Circuits and Controllers

§ 111.45–1 Motor controllers, general requirements.

(a) *Suitability.* Each controller shall be capable of starting and stopping the motor which it controls, and for an alternating-current motor shall be capable of interrupting the stalled-rotor current of the motor.

(b) *Rating.* The controller shall have a horsepower rating, which shall not be lower than the horsepower rating of the motor, except as otherwise permitted in this paragraph.

(1) For a stationary motor rated at ⅛ horsepower or less that is normally left running and is so constructed that it cannot be damaged by overload or failure to start, such as clock motors and the like, the branch circuit overcurrent device may serve as the controller.

(2) For stationary motors rated at 2 horsepower or less, and 300 volts or less, the controller may be a general use switch having an ampere rating at least twice the full load current rating of the motor.

(3) For portable motors rated at ⅓ horsepower or less, the controller may be an attachment plug and receptacle.

(4) A branch circuit circuit breaker, rated in amperes only, may be used as a controller. When this circuit breaker is also used for overcurrent protection, it shall conform to the appropriate provisions of this part governing overcurrent protection.

(c) *Need not open all conductors.* Except when the motor controller serves also as a disconnecting means (see § 111.45–30 (l)) the controller need not open all conductors to the motor.

(d) *In grounded conductors.* One pole of the controller may be placed in a permanently grounded conductor provided the controller is so designed that the pole in the grounded conductor cannot be opened without simultaneously opening all conductors of the circuit.

(e) *Adjacent to motor and driven machinery.* Generally a controller shall be located adjacent to the motor and its driven machinery. Where it is desired to group motor controllers at a central location or where, for other reasons, it is not feasible to locate a controller adjacent to the motor and its driven machine, the following conditions shall be complied with:

(1) The motor and controller disconnecting means required by § 111.45–30 shall be capable of being locked in the open circuit position.

(2) Means shall be provided at the motor to start and stop the motor. Where the starting of a motor would be hazardous when not coordinated with other activities, such as the starting of a fuel oil service pump, the requirements of this subparagraph pertaining to the starting means at the motor need not be complied with.

(3) Means shall be provided at the motor to prevent starting the motor from a remote location. This means may be a switch in the control circuit.

(4) An alternative arrangement is specifically approved.

(f) *Number of motors served by each controller.* Each motor shall be provided with an individual controller, except that for motors of 600 volts or less, a single controller may serve a group of motors under any one of the conditions covered in this paragraph.

(1) If a number of motors drive several parts of a single machine or piece of apparatus.

(2) If a group of motors is under the protection of one over-current device as permitted in § 111.45–20 (c) (1).

(g) *Adjustable-speed motors.* Adjustable-speed motors, if controlled by means of field regulation, shall be so equipped and connected that they cannot be started under weakened field, unless the motor is designed for such starting.

(h) *Speed limitation.* Machines of the types listed in this paragraph shall be provided with speed limiting devices, unless the inherent characteristics of the machine, the system, or the load and the mechanical connection thereto are such as safely to limit the speed, or unless the machine is always under the manual control of a qualified operator.

(1) Separately excited direct-current motors.

(2) Series motors.

(3) Motor-generators and converters which can be driven at excessive speed from the direct-current end, as by reversal of current or decrease in load.

(i) *Enclosure*—(1) *General.* All controlling apparatus, except as otherwise permitted below, shall be protected by enclosing cases, either drip-proof or watertight, depending on their location. Cable entrance plates shall be provided on enclosing cases having a volume exceeding 200 cubic inches. Cable entrance plates for watertight enclosures and at the top of drip-proof enclosures shall be at least ⅛ inch thick and be fitted with gaskets. Watertight enclosures shall be provided with external feet or lugs for mounting.

(2) *Open type.* Control apparatus may be of the open type provided it is located in a compartment or enclosure assigned solely to electrical control equipment and accessible only to qualified persons. Where the compartment is used for other apparatus and the location of an open controller is such that it is subject to accidental contact, adequate guard rails or the equivalent shall be provided.

(j) *Hinged doors.* All controller hinged doors having either a height exceeding 45 inches or a width exceeding 24 inches shall be provided with door positioners and stops. Equipment mounted on a hinged door shall be constructed or shielded in such a manner that no live parts of the door mounted equipment will be exposed to accidental contact by a person with the door open and the circuit energized.

(k) *Grounding.* Controller cases, except insulating covers of snap switches, shall be grounded.

(l) *Construction.* The construction of controlling apparatus and their enclosures shall conform to the requirements of Underwriters' Laboratories, Inc. Standard for Industrial Control Equipment, except that sheet metal enclosures for installation in corrosive locations shall not be installed unless 1 of the conditions covered in this paragraph is complied with.

(1) The enclosure is fabricated of corrosion-resistant material.

(2) The enclosure is fabricated of sheet steel not less than ⅛-inch in thickness and hot dip galvanized after fabrication.

(3) The enclosure is fabricated of sheet steel not less than 3/16-inch in thickness and given a corrosion resistant finish in accordance with § 110.15–40 of this subchapter.

(m) *Wearing parts.* All wearing parts of controllers should be readily accessible for inspection and renewal.

(n) *Protection against low voltage.* Motor controllers for motors of 2 horsepower or larger shall be provided with protection against low voltage. Low-voltage release should be provided only on controllers for auxiliaries which are vital to the operation of the propelling equipment where automatic restart after a voltage failure will not be hazardous. Otherwise, low-voltage protection should be used. To permit prompt restoration of service after interruption, the starting current and short time sustained current of all low-voltage release loads shall be within the capacity of one generator.

(o) *Manually-operated controllers.* Manually-operated controllers shall be arranged for operation without opening the enclosing case. In the panel type the starting arm shall be arranged so that the motor will stop if the arm be left on a starting point. In regulating drum controllers the resistor shall be proportioned for the duty cycle.

(p) *Alternating-current manual auto-starters.* Alternating-current manual auto-starters with self-contained auto-transformers should be provided with switches of the quick-make-and-break type and the starter should be arranged so that it will be impossible to throw to the running position without having first thrown to the starting position. Switches should be preferably of the contactor or air-break type. In case oil is necessary, the starter should not leak when tilted to an angle of 15 degrees and should be constructed to prevent the liquid from splashing out due to the rolling of the vessel.

(q) *Identification of controllers.* A controller shall be marked with the maker's name or identification symbol, the voltage, the current or horsepower rating, and such other data as may be needed properly to indicate the motor which it controls. The identification data necessary to indicate the motor which the controller controls shall be on the external surface of the enclosure. A wiring diagram of the controller shall be permanently attached to the inside of the controller door.

§ 111.45–5 Motor overcurrent protection.

(a) *General.* The following provisions in this section specify overcurrent devices intended to protect the motors, the motor control apparatus, and the branch-circuit conductors against excessive heating due to motor overloads.

(b) *Continuous duty motors more than one horsepower.* Each continuous duty motor rated more than one horsepower shall be protected against overcurrent by one of the means covered in this paragraph. For multi-speed motors each separate winding or winding connection shall be considered separately.

(1) A separate overcurrent device which is responsive to motor current. This device shall be rated or set at not more than 115 percent of the motor full-load current rating. For multi-speed motors this device shall be rated or set at not more than 115 percent of the full-load current rating of each separate winding or winding connection. This value may be modified as permitted by paragraph (g) of this section.

(2) A thermal protector integral with the motor, approved for use with the motor which it protects on the basis that it will prevent dangerous overheating of the motor due to overload or failure to start. If the motor current interrupting device is separate from the motor and its control circuit is operated by a protective device integral with the motor, it shall be so arranged that the opening of the control circuit will result in interruption of current to the motor.

(3) For sealed (hermetic-type) refrigeration motors the protective device specified in subparagraph (1) or (2) of this paragraph shall be rated or set to trip at not more than 125 percent of the motor full-load line.

(c) *Continuous duty motors, one horsepower or less, manually started.* Any motor of one horsepower or less which is portable, is manually started, and is within sight from the starter location, shall be considered as protected against overcurrent by the overcurrent device protecting the conductors of the branch circuit. This branch circuit overcurrent device shall not be larger than that specified by Table 111.45–20 (b3), except that any such motor may be used at 125 volts or less on a branch circuit protected at 20 amperes. Any such motor which is out of sight from the starter location and any such motor which is not portable, shall be protected as specified in paragraph (d) of this section for automatically started motors.

(d) *Continuous duty motors, one horsepower or less, automatically started.* Each continuous duty motor rated at 1 horsepower or less which is automatically started shall be protected against overcurrent by the use of one of the means covered in this paragraph.

(1) In the same manner as provided for motors rated at more than 1 horsepower by paragraph (b) (1) or paragraph (b) (2) of this section.

(2) If part of an approved assembly which does not normally subject the motor to overloads and which is also equipped with other safety controls which protect the motor against damage due to stalled rotor current, the motor will be considered to be protected. Where such protective equipment is used, it shall be indicated on the name plate of the assembly where it will be visible after installation.

(3) If the impedance of the motor windings is sufficient to prevent overheating due to failure to start, the motor may be protected as specified in paragraph (c) of this section for manually started motors.

(e) *Wound-rotor secondaries.* The secondary circuits of wound-rotor alternating-current motors, including conductors, controllers, resistors, etc., shall be considered as protected against overcurrent by the motor-running overcurrent device.

(f) *Intermittent and similar duty.* A motor used for a condition of service which is inherently short time is considered as protected against overcurrent by the branch circuit overcurrent device, provided the overcurrent protection does not exceed that specified in Tables 111.45–20 (b1) and 111.45–20 (b2). Any motor is considered to be for continuous duty unless the nature of the apparatus which it drives is such that the motor cannot operate continuously with load under any condition or unless permitted by § 111.25–15.

(g) *Selection or setting of protective devices.* Where the values specified for motor-running overcurrent protection do not correspond to the standard sizes or rating of fuses, nonadjustable circuit breakers, thermal cutouts, thermal relays, the heating elements of thermal trip motor switches, or possible settings of adjustable circuit breakers adequate to carry the load, the next higher size, rating, or setting may be used, but not higher than 130 percent of the full-load current rating of the motor except that for sealed (hermetic-type) refrigeration motors the rating or setting of the protective device shall not be higher than 140 percent of the full-load current rating of the motor. If not shunted during the starting period of the motor (see paragraph (h) of this section), the protective device shall have sufficient time delay to permit the motor to start and accelerate its load.

(h) *Shunting during starting period.* If the motor is manually started (including starting with a magnetic starter having push-button control) the running overcurrent protection may be shunted or cut out of the circuit during the starting period of the motor, provided the device by which the overcurrent protection is shunted or cut out cannot be left in the starting position, and the motor shall be considered as protected against overcurrent during the starting period if fuses or time-delay circuit breakers, rated or set at not over 400 percent of the full-load current of the motor, are so located in the circuit as to be operative during the starting period of the motor. The motor-running overcurrent protection shall not be shunted or cut out during the starting period if the motor is automatically started.

(i) *Fuses; in which conductor.* If fuses are used for motor-running protection, a fuse shall be inserted in each ungrounded conductor, except that a fuse shall also be inserted in a grounded conductor under the circumstances set forth in footnote 1 of Table 111.45–5 (j) for circuits supplied by wye-delta or delta-wye connected transformers.

(j) *Devices other than fuses; in which conductors.* If devices other than fuses are used for motor-running protection, Table 111.45–5 (j) shall govern the minimum allowable number and location of overcurrent units, such as trip coils, relays, or thermal cutouts.

TABLE 111.45–5 (j)—MINIMUM NUMBER AND LOCATION OF MOTOR-RUNNING PROTECTIVE DEVICES

Kind of motor	Supply system	Number and location of overcurrent units, such as trip coils, relays, or thermal cut-outs
1-phase a. c. or d. c.	2-wire, 1-phase a. c. or d. c., ungrounded	1 in either conductor.
1-phase a. c. or d. c.	2-wire, 1-phase a. c. or d. c., one conductor grounded	1 in ungrounded conductor.
1-phase a. c. or d. c.	3-wire, 1-phase a. c. or d. c., grounded-neutral	1 in either ungrounded conductor.
3-phase a. c.	3-wire, 3-phase a. c. ungrounded	2 in any 2 conductors.[1]
3-phase a. c.	3-wire, 3-phase, one conductor grounded	2 in ungrounded conductors.[1]
3-phase a. c.	3-wire, 3-phase a. c., grounded-neutral	2 in any 2 conductors.[1]
3-phase a. c.	4-wire, 3-phase a. c. grounded neutral or ungrounded	2 in any 2 conductors, except the neutral.[1]

[1] In the case of distribution systems supplying wye-delta or delta-wye connected transformers (having the wye neutral point in the primary ungrounded or not connected to the circuit) three running overcurrent units shall be provided for the protection of 3-phase 3-wire motors.

(k) *Number of conductors disconnected by overcurrent devices.* Motor-running protective devices, other than fuses, thermal cutouts, or thermal protectors, shall simultaneously open a sufficient number of ungrounded conductors to interrupt current flow to the motor.

(l) *Motor controller as running protection.* A motor controller may also serve as the running overcurrent device if the number of overcurrent units complies with Table 111.45–5 (j), and if these overcurrent units are operative in both the starting and running position in

the case of a direct-current motor, and in the running position in the case of an alternating-current motor.

(m) *Thermal cutouts and relays.* Thermal cutouts, thermal relays and other devices for motor-running protection which are not capable of opening short circuits, shall be protected by fuses or circuit breakers with ratings or settings of not over 4 times the rating of the motor for which they are designed, unless approved for group installation, and marked to indicate the maximum rating or setting of the overcurrent device by which they must be protected.

(n) *Rating of protective devices.* Motor-running overcurrent devices other than fuses shall have a rating of at least 115 percent of the full load current rating of the motor.

(o) *Automatic restarting.* A motor-running protective device which can restart a motor automatically after overcurrent tripping shall not be installed.

(p) *Steering gear motors.* Main steering gear motors and motors associated with steering control systems shall not be provided with a motor-running protective device. In lieu of a motor-running overcurrent protection, the motor starter shall be fitted with a protective device responsive to motor current, motor temperature, or to both current and temperature which will operate an indicating light at the propulsion control station in case of overload which would cause overheating of the motor. This device shall follow as closely as practicable the temperature of the motor.

§ 111.45–10 Remote-control, electrical interlock, and indicator circuits.

(a) *General.* The deviations from the general requirements in this subchapter as covered by this section are intended to provide for peculiar conditions governing remote-control, electrical interlock, and indicator circuits.

(b) *Overcurrent protection.* Conductors of control, electrical interlock, and indicator circuits of motor controllers shall be considered as being properly protected against overcurrent by the branch circuit overcurrent device where the conductors are wholly within the controller enclosure. Conductors of control, electrical interlock, and indicator circuits external to the controller enclosure shall be considered as being properly protected against overcurrent under any one of the conditions listed in this paragraph.

(1) If the rating or setting of the branch-circuit overcurrent device is not more than 500 percent of the current-carrying capacity of the control, electrical interlock, or indicator circuit conductors.

(2) By overcurrent devices, in both sides of the line, having a rating or setting of not more than 500 percent of the current-carrying capacity of the control, electrical interlock, or indicator circuit conductors, except that where under operating conditions there is no appreciable difference in potential between the external conductors, overcurrent protection need only be provided at the supply of that side of the line.

(3) If the opening of the control, electrical interlock, or indicator circuit would create a hazard, no overcurrent protection shall be provided.

(4) For overcurrent protection of steering gear control and indicator light circuits see § 111.65–55(d)(2).

(c) *Accidental grounds.* It is recommended that remote control circuits be so arranged that an accidental ground will not start the motor.

(d) *Source of potential.* The potential for a control, interlock, or indicator circuit shall be derived from the load side of the motor and controller disconnect means specified by § 111.45–30, except that where the control functions are such that such circuits must be common to two or more controllers, the switching arrangements specified by paragraph (e) of this section, shall be complied with.

(e) *Switching.* In the design of control, interlock, and indicator circuits, all possible steps shall be taken to eliminate more than one source of potential in an enclosure. Where the control functions are such as to make it impracticable to energize a control, interlock, or indicator circuit from the load side of the motor and controller disconnect means specified by § 111.45–30, one of the following alternative methods of switching shall be employed:

(1) The potential of the control, interlock, or indicator circuits shall be limited to not more than 24 volts, in which case no disconnecting means need be provided.

(2) The conductors of control, interlock, or indicator circuits shall be disconnected from all sources of potential by a disconnect device independent of the motor and controller disconnect device specified by § 111.45–30. The two independent devices shall be located immediately adjacent one to the other, and a sign, warning the operator to open both devices to disconnect completely the motor and controller, shall be permanently attached to the exterior of the door of the main disconnect device.

(3) The conductors of control, interlock, or indicator circuits shall be disconnected from all sources of potential by a disconnect device actuated by the opening of the controller door, this device and its connections (including terminal blocks, when employed, for terminating the ships wiring) being such that there are no electrically uninsulated or unshielded surfaces.

§ 111.45–15 Heater circuits.

(a) Where motors, master switches and similar enclosures, except motor controllers, are fitted with electric heaters located inside the enclosures and energized from a separate circuit, the heater circuits shall be disconnected in the same manner as required for control, interlock and indicator circuits in § 111.45–10(e)(2). In the case of deck machinery, when the location of the motor, master switch, or similar enclosure is remote from the motor and controller disconnect device, a warning sign may be affixed to the unit enclosure warning the operator of the presence of two sources of potential within the unit enclosure and giving the location of the heater circuit disconnect device in lieu of the disconnect arrangement required by § 111.45–10(e)(2). Electric heaters installed within motor controllers and energized from a separate circuit shall be disconnected in the same manner as required by § 111.45–10(e).

§ 111.45–20 Motor-branch-circuit overcurrent protection.

(a) *General.* The provisions covered by this section specify overcurrent devices intended to protect the motor-branch-circuit conductors, the motor control apparatus, and the motors against overcurrent due to short-circuits or grounds. They are in addition to or amendatory of the provisions of Subpart 111.55.

(b) *Rating or setting for individual motors.* The motor-branch-circuit overcurrent device shall be capable of carrying the starting current of the motor. Overcurrent protection shall be considered as being obtained when this overcurrent device has a rating or setting not exceeding the values given in Tables 111.45–20 (b1) and 111.45–20 (b2).

(1) If the values for motor-branch-circuit protective devices given in Tables 111.45–20 (b1) and 111.45–20 (b2) do not correspond to the standard sizes of fuses or ratings of nonadjustable circuit breakers or possible settings of adjustable circuit breakers adequate to carry the load, the next higher size, rating or setting may be used.

(2) Where the overcurrent protection specified in Tables 111.45–20 (b1) and 111.45–20 (b2) is not sufficient for the starting current of the motor, it may be increased but shall, in no case exceed 400 percent of the motor full-load current.

TABLE 111.45-20(b1)—MAXIMUM RATING OR SETTING OF MOTOR BRANCH CIRCUIT PROTECTIVE DEVICES FOR MOTORS MARKED WITH A CODE LETTER INDICATING LOCKED ROTOR KVA

Type of motor [2]	Percent of full-load current [1]	
	Fuse rating (see also Table 111.45-20 (b3))	Circuit breaker setting; time-limit type
All a.c. single-phase and polyphase squirrel cage and synchronous motors with full-voltage, resistor or reactor starting:		
Code Letter A	150	150
Code Letter B to E	250	200
Code Letter F to V	300	250
All a.c. squirrel cage and synchronous motors with autotransformer starting:		
Code Letter A	150	150
Code Letter B to E	200	200
Code Letter F to V	250	200

[1] For certain exceptions to the values specified, see §§ 111.45-5(c), 111.45-20(b), and 111.45-20(g).
[2] For motors not marked with a code letter, see Table 111.45-20 (b2).

TABLE 111.45-20 (b2)—MAXIMUM RATING OR SETTING OF MOTOR-BRANCH-CIRCUIT PROTECTIVE DEVICES FOR MOTORS NOT MARKED WITH A CODE LETTER INDICATING LOCKED ROTOR KVA

Type of motor	Percent of full-load current [1]		
	Fuse rating	Circuit breaker setting	
		Instantaneous type	Time limit type
Single-phase, all types	300	.....	250
Squirrel-cage and synchronous (full-voltage, resistor and reactor starting)	300	.....	250
Squirrel-cage and synchronous (autotransformer starting):			
Not more than 30 amperes	250	.....	200
More than 30 amperes	200	.....	200
High-reactance squirrel-cage:			
Not more than 30 amperes	250	.....	250
More than 30 amperes	200	.....	200
Wound rotor	150	.....	150
Direct current:			
Not more than 50 horsepower	150	250	150
More than 50 horsepower	150	175	150

[1] For certain exceptions to the values specified, see §§ 111.45-5 (c), 111.45-20 (b), and 111.45-20 (g).
[2] Synchronous motors of the low-torque low-speed type (usually 450 r. p. m. or lower) such as are used to drive reciprocating compressors, pumps, etc., which start up unloaded, do not require a fuse rating or circuit breaker setting in excess of 200 percent of full-load current.
[3] For motors marked with a code letter, see Table 111.45-20 (b1).

(3) Table 111.45-20 (b3) tabulates usual values of motor-branch-circuit protection, motor-running protection, and minimum cable size for various motor full-load currents for ease of reference.

(c) *Several motors on one branch circuit.* Two or more motors may be connected to the same branch circuit under the conditions covered in this paragraph.

(1) Two or more motors each not exceeding 1 horsepower in rating and each having a full-load rated current not exceeding 6 amperes, may be used on a branch circuit protected at not more than 20 amperes at 125 volts or less, or 15 amperes at 600 volts or less. Individual running overcurrent protection is unnecessary for such motors unless required by the provisions of § 111.45-5 (c) or (d).

(2) Two or more motors of any ratings, each having individual running overcurrent protection, may be connected to one branch circuit provided all of the conditions contained in this subparagraph are complied with.

(i) Each motor-running overcurrent device must be approved for group installation.

(ii) Each motor controller must be approved for group installation.

(iii) The branch circuit must be protected by an overcurrent device having a rating or setting equal to that specified in paragraph (b) of this section for the largest motor connected to the branch circuit plus an amount equal to the sum of the full-load current ratings of all other motors connected to the circuit.

(iv) The branch circuit overcurrent protection must not be greater than that allowed by § 111.45-5 (m) for the thermal cutout or relay protecting the smallest motor of the group.

(v) The conductors of any tap supplying a single motor need not have individual branch circuit protection, provided they comply with either of the following: (*a*) No conductor to the motor shall have a current-carrying capacity less than that of the branch circuit conductors; or (*b*) no conductor to the motor shall have a current-carrying capacity less than one third that of the branch circuit conductors, with a minimum in accordance with paragraph (b) of this section, the conductors to the motor running protective device being not more than 25 feet long and being protected from mechanical injury.

(d) *Combined overcurrent protection.* Motor-branch-circuit overcurrent protection and motor-running overcurrent protection may be combined in a single overcurrent device if the rating or setting of the device provides the running overcurrent protection specified in § 111.45-5 (b), (c), and (d).

(e) *Overcurrent devices; in which conductor.* Overcurrent devices shall comply with the provisions of Subpart 111.55.

(f) *Rating of circuit breakers.* Circuit breakers for motor-branch-circuit protection shall have a continuous current rating of not less than 115 percent of the full-load current rating of the motors.

(g) *Selection or setting of protective devices.* If the values for branch circuit protective devices required by this section do not correspond to the standard sizes or ratings of fuses, nonadjustable circuit breakers, or thermal devices, or possible settings of adjustable circuit breakers, adequate to carry the load, the next higher size, rating, or setting may be used.

(h) *Steering gear motor branch circuits*—(1) *General.* In lieu of the requirements of paragraphs (a) to (f), inclusive, of this section, each steering gear branch circuit shall be protected only by a circuit breaker with instantaneous trip located on the switchboard from which it emanates.

(2) *Direct-current motors.* For direct-current steering gear motors, each circuit breaker shall be of the instantaneous trip type only, set to trip at a current of not less than 300 percent and not greater than 375 percent of the rated full-load current of one steering gear main motor.

(3) *Alternating-current motors.* For alternating-current steering gear motors, each circuit breaker shall be of the instantaneous trip type only, set to trip at a current of approximately 175 percent of the locked rotor current of one steering gear main motor.

(4) *Use of fuses.* On vessels of a size that may be steered by hand, fused switches may be substituted for the instantaneous trip circuit breakers required by this paragraph: *Provided,* That the arrangement of the steering gear is such that it is possible to shift to hand steering without delay: *And provided further,* That the opening of a steering gear branch circuit fuse is indicated in the wheelhouse.

(5) *General considerations.* The requirements of this paragraph contemplate the following conditions:

(i) When two steering gear main motors are provided, one is a standby which normally runs only when started preparatory to change-over, and then without load.

(ii) Auxiliary motors (servo, replenishing and filling pumps, etc.), if and as required, have an aggregate rating of not more than 10 percent of the main steering gear motor rating.

§ 111.45-25 Motor feeder overcurrent protection.

(a) *General.* The following provisions contained in this section specify overcurrent devices intended to protect feeder conductors supplying motors against overcurrents due to short-circuits or grounds.

(b) *Rating or setting, motor loads.* (1) A feeder which supplies motors shall be provided with overcurrent protection which shall not be greater than the largest rating or setting of the branch circuit protective device, for any motor of the group (based on Tables 111.45-20 (b1), 111.45-20 (b2) and 111.45-20 (b3)) plus the sum of the full load currents of the other motors of the group.

(2) If two or more motors of equal horsepower rating are the largest in the group, one of these motors should be considered as the largest for the above calculation.

(3) If two or more motors of a group must be started simultaneously, it may be necessary to install larger feeder conductors and correspondingly larger ratings or settings of feeder overcurrent protective devices.

(4) Where larger capacity feeders are installed to provide for future additions or changes, the feeder overcurrent protection may be based on the rated current-carrying capacity of the feeder conductors.

§ 111.45-30 Disconnecting means.

(a) *General.* The provisions contained in this section are intended to require disconnecting means for motors and controllers capable of disconnecting them from the circuit.

(b) *Type.* The disconnecting means shall be an enclosed, externally operable, motor-circuit switch, rated in horsepower, or a circuit breaker, except as permitted in the paragraphs (c), (d), (e), (f), and (g) of this section. Every switch in the motor branch circuit within sight from the controller location shall comply with these requirements.

(c) *One-eighth horsepower or less.* For stationary motors of ⅛ horsepower or less, the branch-circuit overcurrent device may serve as the disconnecting means.

(d) *Two horsepower or less.* For stationary motors rated at 2 horsepower or less and 300 volts or less, the disconnecting means may be a general-use switch having an ampere rating at least twice the full-load current rating of the motor.

(e) *Over two horsepower to and including 50 horsepower.* The separate disconnecting means required for a motor with an autotransformer type of controller may be a general-use switch if all of the provisions contained in this paragraph are complied with.

TABLE 111.45-20(b3)—CONDUCTOR SIZE AND OVERCURRENT PROTECTION FOR MOTORS

Full load current rating of motor in amperes	Minimum size conductor AWG and MCM									For running protection of motors (amperes) [1]		Maximum allowable rating or setting of branch circuit protective devices (amperes) [2]							
	1-conductor			2-conductor			3-conductor					With code letters F to V, inclusive, or without code letters: Single-phase and squirrel cage and synchronous, full voltage, resistor and reactor starting		With code letters B to E, inclusive: Single-phase and squirrel cage and synchronous, full voltage resistor or reactor starting. With code letters F to V, inclusive: Auto-transformer starting. Without code letters: Squirrel cage and synchronous, auto-transformer starting; high reactance squirrel cage.[3] (Both not more than 30 amperes)		With code letters B to E, inclusive: Squirrel cage and synchronous, auto-transformer, starting. Without code letters: Squirrel cage and synchronous, auto-transformer starting; high reactance squirrel cage.[3] (Both more than 30 amperes)		With code letter A: All motors, Without code letters: Direct-current and wound rotor motors	
	R	VC	AVC	R	VC	AVC	R	VC	AVC	Maximum rating of nonadjustable protective devices	Maximum setting of adjustable protective devices	Fuses	Circuit breakers (nonadjustable trip)	Fuses	Circuit breakers (nonadjustable trip)	Fuses	Circuit breakers (nonadjustable trip)	Fuses	Circuit breakers (nonadjustable trip)
[4]1	14	12	14	14	12	14	14	12	14	[5]2	[5]1.15	15	15	15	15	15	15	15	15
[4]2	14	12	14	14	12	14	14	12	14	[5]3	[5]2.3	15	15	15	15	15	15	15	15
[4]3	14	12	14	14	12	14	14	12	14	[5]4	[5]3.45	15	15	15	15	15	15	15	15
[4]4	14	12	14	14	12	14	14	12	14	[5]6	[5]4.6	15	15	15	15	15	15	15	15
[4]5	14	12	14	14	12	14	14	12	14	[5]6	[5]5.75	15	15	15	15	15	15	15	15
6	14	12	14	14	12	14	14	12	14	[5]8	[5]6.9	20	15	15	15	15	15	15	15
7	14	12	14	14	12	14	14	12	14	[5]10	[5]8.05	25	20	20	15	15	15	15	15
8	14	12	14	14	12	14	14	12	14	[5]10	[5]9.2	25	20	20	20	20	20	15	15
9	14	12	14	14	12	14	14	12	14	[5]12	[5]10.35	30	30	25	20	20	20	15	15
10	14	12	14	14	12	14	14	12	14	[5]12	[5]11.5	30	30	25	20	20	20	15	15
11	14	12	14	14	12	14	14	12	14	[5]15	[5]12.65	35	30	30	30	25	30	20	20
12	14	12	14	14	12	14	14	12	14	15	13.8	40	30	30	30	25	30	20	20
13	12	12	14	12	12	14	12	12	14	15	14.95	40	40	35	30	30	30	20	20
14	12	12	14	12	12	14	12	12	12	20	16.1	45	40	35	30	30	30	25	30
15	12	12	14	12	12	14	12	12	12	20	17.25	45	40	40	30	30	30	25	30
16	12	12	14	12	12	12	12	12	12	20	18.4	50	40	40	40	35	40	25	30
17	12	12	12	12	12	12	10	12	12	20	19.55	60	50	45	40	35	40	30	30
18	12	12	12	10	12	12	10	12	12	25	20.7	60	50	45	40	40	40	30	30
19	12	12	12	10	12	12	10	10	12	25	21.8	60	50	50	40	40	40	30	30
20	10	12	12	10	12	12	10	10	12	25	23.0	60	50	50	40	40	40	30	30
22	10	12	12	10	10	12	10	10	10	30	25.3	70	70	60	50	45	50	35	40
24	10	12	12	10	10	12	8	10	10	30	27.6	80	70	60	50	50	50	40	40
26	10	10	12	8	10	10	8	10	10	30	29.9	80	70	70	70	60	70	40	40
28	8	10	12	8	10	10	8	8	10	35	32.2	90	70	70	70	60	70	45	50
30	8	10	10	8	10	10	8	8	10	35	34.5	90	100	80	70	60	70	45	50
32	8	10	10	8	10	10	7	8	8	40	35.8	100	100	80	70	70	70	50	50
34	8	10	10	7	8	10	7	8	8	40	39.1	110	100	90	70	70	70	60	70
36	8	10	10	7	8	10	6	8	8	45	41.4	110	100	90	100	80	100	60	70
38	7	10	10	7	8	8	6	7	8	45	43.7	125	100	100	100	80	100	60	70
40	7	8	10	6	8	8	5	7	8	50	46.0	125	100	100	100	80	100	60	70
42	7	8	10	6	8	8	5	6	7	50	48.3	125	125	110	100	90	100	70	70
44	6	8	8	6	8	8	5	6	7	60	50.6	125	125	110	100	90	100	70	70
46	6	8	8	5	7	8	4	6	6	60	52.9	150	125	125	100	100	100	70	70
48	6	8	8	5	7	8	4	6	6	60	55.2	150	125	125	100	100	100	80	100
50	6	8	8	5	7	7	4	5	6	60	57.5	150	125	125	100	100	100	80	100
52	5	8	8	4	6	7	4	5	6	60	59.8	175	150	150	125	110	125	80	100
54	5	7	8	4	6	7	3	5	5	70	62.1	175	150	150	125	110	125	90	100
56	5	7	8	4	6	7	3	5	5	70	64.4	175	150	150	125	125	125	90	100
58	4	7	8	4	6	6	3	4	5	70	66.7	175	150	150	125	125	125	90	100
60	4	6	7	3	5	6	3	4	5	70	69.0	200	150	150	125	125	125	90	100
62	4	6	7	3	5	6	2	4	5	80	71.3	200	175	175	125	125	125	100	100
64	4	6	7	3	5	6	2	4	4	80	73.6	200	175	175	150	150	150	100	100
66	4	6	6	3	5	5	2	3	4	80	75.9	200	175	175	150	150	150	100	100
68	4	6	6	3	5	5	2	3	4	80	78.2	225	175	175	150	150	150	110	125
70	3	5	6	2	4	5	1	3	4	90	80.5	225	175	175	150	150	150	110	125
72	3	5	6	2	4	5	1	3	3	90	82.8	225	200	200	150	150	150	110	125
74	3	5	6	2	4	5	1	2	3	90	85.1	225	200	200	150	150	150	125	125
76	3	5	6	2	4	5	1	2	3	90	87.4	250	200	200	175	175	175	125	125
78	3	5	5	1	3	4	1	2	3	90	89.7	250	200	200	175	175	175	125	125
80	2	4	5	1	3	4	0	2	3	100	92.0	250	200	200	175	175	175	125	125
82	2	4	5	1	3	4	0	2	2	100	94.3	250	225	225	175	175	175	125	150
84	2	4	5	1	3	4	0	2	2	100	96.6	250	225	225	175	175	175	150	150
86	2	4	5	1	3	4	0	1	2	100	98.9	300	225	225	175	175	175	150	150
88	2	4	5	1	3	3	0	1	2	110	101.2	300	225	225	200	200	200	150	150
90	2	4	4	0	2	3	0	1	2	110	103.5	300	225	225	200	200	200	150	150
92	2	3	4	0	2	3	00	1	2	110	105.8	300	250	250	200	200	200	150	150
94	1	3	4	0	2	3	00	1	2	110	108.1	300	250	250	200	200	200	150	150
96	1	3	4	0	2	3	00	1	1	125	110.4	300	250	250	200	200	200	150	150
98	1	3	4	0	2	3	00	1	1	125	112.7	300	250	250	200	200	200	150	150
100	1	3	4	0	2	2	00	0	1	125	115	300	250	250	200	200	200	150	150

See footnotes at end of table.

TABLE 111.45-20(b3)—CONDUCTOR SIZE AND OVERCURRENT PROTECTION FOR MOTORS—Continued

Full load current rating of motor in amperes	Minimum size conductor AWG and MCM									For running protection of motors (amperes) [1]		Maximum allowable rating or setting of branch circuit protective devices (amperes) [2]							
	1-conductor			2-conductor			3-conductor					With code letters F to V, inclusive, or without code letters: Single-phase and squirrel cage and synchronous, full voltage, resistor and reactor starting		With code letters B to E, inclusive: Single-phase and squirrel cage and synchronous, full voltage resistor or reactor starting. With code letters F to V, inclusive: Auto-transformer starting. Without code letters: Squirrel cage and synchronous, auto-transformer starting; high reactance squirrel cage,[3] (Both not more than 30 amperes)		With code letters B to E, inclusive: Squirrel cage and synchronous, auto-transformer, starting. Without code letters: Squirrel cage and synchronous, auto-transformer starting; high reactance squirrel cage,[3] (Both more than 30 amperes)		With code letter A: All motors. Without code letters: Direct-current and wound rotor motors	
	R	VC	AVC	R	VC	AVC	R	VC	AVC	Maximum rating of nonadjustable protective devices	Maximum setting of adjustable protective devices	Fuses	Circuit breakers (nonadjustable trip)	Fuses	Circuit breakers (nonadjustable trip)	Fuses	Circuit breakers (nonadjustable trip)	Fuses	Circuit breakers (nonadjustable trip)
105	1	3	3	00	1	2	000	0	1	125	120.75	350	300	300	225	225	225	175	175
110	0	2	3	00	1	2	000	0	0	150	126.5	350	300	300	225	225	225	175	175
115	0	2	3	00	1	1	000	00	0	150	132.25	350	300	300	250	250	250	175	175
120	0	2	2	000	0	1	4/0	00	0	150	138	400	300	300	250	250	250	200	200
125	00	1	2	000	0	1	4/0	00	0	150	143.75	400	350	350	250	250	250	200	200
130	00	1	2	000	0	1	4/0	00	00	150	149.5	400	350	350	300	300	300	200	200
135	00	1	2	4/0	0	0	4/0	000	00	175	155.25	450	350	350	300	300	300	225	225
140	00	1	1	4/0	00	0	250	000	00	175	161	450	350	350	300	300	300	225	225
145	000	0	1	4/0	00	0	250	000	00	175	166.75	450	400	400	300	300	300	225	225
150	000	0	1	4/0	00	0	300	000	000	175	172.5	450	400	400	300	300	300	225	225
155	000	0	1	4/0	00	00	300	4/0	000	200	178.25	500	400	400	350	350	350	250	250
160	000	0	0	250	000	00	300	4/0	000	200	184	500	400	400	350	350	350	250	250
165	000	0	0	250	000	00	300	4/0	000	200	189.75	500	500	450	350	350	350	250	250
170	4/0	00	0	250	000	00	350	4/0	4/0	200	195.5	500	500	450	350	350	350	300	300
175	4/0	00	0	300	000	000	350	250	4/0	225	201.25	600	500	450	350	350	350	300	300
180	4/0	00	0	300	4/0	000	350	250	4/0	225	207	600	500	450	400	400	400	300	300
185	4/0	00	00	300	4/0	000	350	250	4/0	225	212.75	600	500	500	400	400	400	300	300
190	4/0	00	00	300	4/0	000	400	250	4/0	225	218.5	600	500	500	400	400	400	300	300
195	250	000	00	350	4/0	000	400	300	250	225	224.25	600	500	500	400	400	400	300	300
200	250	000	00	350	4/0	4/0	450	300	250	250	230	600	500	500	400	400	400	300	300
210	250	000	00	350	250	4/0	450	300	250	250	241.5	----------	600	600	500	450	500	350	350
220	300	4/0	000	400	250	4/0	500	350	300	300	253	----------	600	600	500	450	500	350	350
230	300	4/0	000	450	300	250	550	350	300	300	264.5	----------	600	600	500	500	500	350	350
240	300	4/0	000	450	300	250	550	400	350	300	276	----------	600	600	500	500	500	400	400
250	350	250	4/0	500	300	250	600	400	350	300	287.5	----------	----------	----------	500	500	500	400	400
260	350	250	4/0	500	350	300	650	450	350	300	299	----------	----------	----------	600	600	600	400	400
270	350	250	4/0	550	350	300	650	450	400	350	310.5	----------	----------	----------	600	600	600	450	500
280	400	250	250	600	350	300	------	500	400	350	322	----------	----------	----------	600	600	600	450	500
290	400	300	250	600	400	350	------	500	450	350	333.5	----------	----------	----------	600	600	600	450	500
300	450	300	250	650	400	350	------	550	450	350	345	----------	----------	----------	600	600	600	450	500
320	500	350	300	------	450	400	------	600	500	400	368	----------	----------	----------	----------	----------	----------	500	500
340	550	350	300	------	500	450	------	650	550	400	391	----------	----------	----------	----------	----------	----------	600	600
360	600	400	350	------	550	450	------	------	600	450	414	----------	----------	----------	----------	----------	----------	600	600
380	650	450	350	------	600	500	------	------	650	450	437	----------	----------	----------	----------	----------	----------	600	600
400	700	450	400	------	650	550	------	------	------	500	460	----------	----------	----------	----------	----------	----------	600	600
420	750	500	450	------	------	600	------	------	------	500	483	----------	----------	----------	----------	----------	----------	----------	----------
440	800	550	450	------	------	650	------	------	------	600	506	----------	----------	----------	----------	----------	----------	----------	----------
460	850	600	500	------	------	------	------	------	------	600	529	----------	----------	----------	----------	----------	----------	----------	----------
480	950	650	550	------	------	------	------	------	------	600	552	----------	----------	----------	----------	----------	----------	----------	----------
500	1,000	650	550	------	------	------	------	------	------	600	575	----------	----------	----------	----------	----------	----------	----------	----------

[1] Values may be modified as permitted by § 111.45-5.
[2] Values may be modified as permitted by § 111.45-20.
[3] High-reactance squirrel cage motors are those designed to limit the starting current by means of deep-slot secondaries or double-wound secondaries and are generally started on full voltage.
[4] For the grouping of small motors under the protection of a single set of fuses, see § 111.45-20 (c).
[5] For running protection of motors of 1 horsepower or less, see § 111.45-5 (c).

(1) The motor drives a generator which is provided with overcurrent protection.

(2) The controller is:

(i) Capable of interrupting the stalled rotor current of the motor,

(ii) Provided with a no-voltage release, and

(iii) Provided with running overcurrent protection not exceeding 115 percent of the motor full-load current rating.

(3) Separate fuses or a circuit breaker, rated or set at not more than 150 percent of the motor full-load current are provided in the motor branch circuit.

(f) *Exceeding 50 horsepower.* For stationary motors rated at more than 50 horsepower, the disconnecting means may be a motor-circuit switch also rated in amperes, a general-use switch, or an isolating switch. Isolating and general-use switches for motors exceeding 50 horsepower, not capable of interrupting stalled-rotor currents, shall be plainly marked "Do not open under load."

(g) *Portable motors.* For portable motors an attachment plug and receptacle may serve as the disconnecting means.

(h) *Current-carrying capacity.* The disconnecting means shall have a current-carrying capacity of at least 115 percent of the current rating of the motor.

(i) *Poles; in which conductors.* The disconnecting means shall simultaneously open all conductors.

(j) *To be indicating.* The disconnecting means shall plainly indicate whether it is in the open or closed position.

(k) *To disconnect both motor and controller.* The disconnecting means shall disconnect both the motor and the controller from all supply conductors. The disconnecting means may be in the same enclosure with the controller.

(l) *Switch or circuit breaker as both controller and disconnecting means.* A switch or circuit breaker complying with the provisions of § 111.45–1 (b) may serve as both controller and disconnecting means if it opens all conductors to the motor, is protected by an overcurrent device (which may be the branch circuit fuses) which opens all ungrounded conductors to the switch or circuit breaker, and is one of the types listed in this paragraph.

(1) An air-break switch, operable directly by applying the hand to a lever or handle.

(2) A circuit breaker switch operable directly by applying the hand to a lever or handle.

(3) An oil switch used on a circuit whose rating does not exceed 600 volts or 100 amperes, or on a circuit exceeding this capacity if under expert supervision and by special approval.

(4) The oil switch or circuit breaker specified above may be both power and manually operable. If power operable, provisions shall be made to lock it in the open position. The overcurrent device protecting the controller may be part of the controller assembly or may be separate. A compensator type controller is not included above and will require a separate disconnecting means.

(m) *Panelboard or switchboard devices, as disconnecting means.* A branch circuit switch or circuit breaker may serve as the disconnecting means provided it conforms to all the requirements of this section. When provision for locking in the open circuit position is required by paragraph (n) of this section, accessibility for manual operation of any other switch or circuit breaker on the panelboard or switchboard shall not be interfered with.

(n) *In sight from controller location.* The disconnecting means shall be located within sight of controller location or be arranged to be locked in the open circuit position. A distance of more than 50 feet is considered equivalent to being out of sight. The disconnecting means shall be located in the same ship's compartment with the controller.

(o) *Motors served by a single disconnecting means.* Each motor shall be provided with individual disconnecting means, except that for motors of 600 volts or less a single disconnecting means may serve a group of motors under any one of the conditions covered in this paragraph. The disconnecting means serving a group of motors shall have a rating not less than is required by paragraph (b) of this section for a single motor whose rating equals the sum of the horsepowers or currents of all motors of the group.

(1) If a number of motors drive several parts of a single machine or piece of apparatus such as metal and woodworking machines, cranes, and hoists.

(2) If a group of motors is under the protection of one set of overcurrent devices as permitted by § 111.45–20 (c).

(p) *Readily accessible.* The disconnecting means shall be readily accessible.

§ 111.45–35 Special requirements for over 600 volts.

(a) *General.* The following provisions contained in this section recognize the additional hazard due to the use of high voltage. They are in addition to or amendatory of the other provisions of this subpart.

(b) *Motor overcurrent protection.* Running overcurrent protection for a motor of over 600 volts shall consist of a circuit breaker, or of overcurrent units integral with the controller which shall simultaneously open all ungrounded conductors to the motor. The overcurrent device shall have a setting as specified in § 111.45–5.

(c) *Circuit overcurrent protection.* Each motor branch circuit and feeder of more than 600 volts shall be protected against overcurrent by means of a circuit breaker of suitable rating so arranged that it can be serviced without hazard.

§ 111.45–40 Group control panels.

(a) *General.* The provisions in this section are in addition to and amendatory of the other provisions of this subpart and are applicable to two or more motor controllers grouped into a motor control center and supplied by a common feeder. The provisions of this paragraph are not applicable to the controllers for two or more motors driving several parts of a single machine or piece of apparatus when the controllers are grouped or installed in a single enclosure.

(b) *Arrangement.* Each controller and its associated motor overcurrent protective device, motor-branch-circuit overcurrent protective device and disconnecting means shall be mounted in a common metal enclosure provided with a hinged door.

(c) *Door interlock.* The hinged door required above shall be interlocked with the disconnect device to prevent the door being opened with the circuit energized.

(d) *Working space.* Working space, generally not less than 30 inches and at no point less than 24 inches, shall be provided in front of group control boards. Where access to the rear is required for making connections and for subsequent inspections, or for other purposes, space adequate for the work to be done, and in no case less than 18 inches, shall be provided.

(e) *Nameplates.* Circuit nameplates in accordance with § 111.35–1 (h) shall be provided.

(f) *Motor and motor branch circuit overcurrent protection.* In lieu of the requirements of § 111.45–5(m) and § 111.45–20(b), a motor branch circuit of group control panels may be considered to be protected against overcurrent by an instantaneous trip circuit breaker set to trip at a value not exceeding 1500 percent of the motor full-load current, provided that all the conditions of this paragraph are fulfilled.

(1) The thermal cutout, thermal relay, or other device for motor-running protection shall be capable of operation without damage to itself from a current up to the setting of the branch circuit circuit breaker.

(2) The motor controller shall be capable of opening the circuit without damage to itself resulting from a current up to the setting of the branch circuit circuit breaker.

Subpart 111.50—Distribution and Circuit Loads

§ 111.50–1 Distribution, general requirements.

(a) *General.* The ship's structure shall not be used as a normal current-carrying conductor for a ship's power, heating or lighting system, except when approved for special purposes. Such hull return shall not be used on tankers. Current-carrying parts are to be substantially protected against accidental contact. For current-carrying capacities of conductors, see Tables 111.60–1 (c)(1)(i) and 111.60–1(e)(1)(ii).

(b) *Circuits derived from auto-transformers.* Branch circuits shall not be supplied through auto-transformers (transformers in which a part of the winding is common to both primary and secondary circuits).

(c) *Polarity identification of conductors.* (1) On systems having a grounded conductor, the grounded conductor shall be identified throughout the vessel by means of a white or natural gray conductor outer covering, and any conductor so identified shall not be used as an ungrounded conductor of a circuit unless the conductor is rendered permanently unidentified by painting or other effective means at each outlet. On ungrounded systems, it is recommended that conductor identification be consistent throughout the vessel.

(2) An insulated conductor of a portable cable intended to be used as a grounding conductor shall have a continuous identifying marker readily distinguishing it from the other conductors. The identifying marker shall consist of either a braid finished to show a green color or a green colored insulation. The requirements of this subparagraph shall be effective on vessels contracted for on or after November 19, 1956.

(d) *Connections to screw-shell lampholders.* On branch circuits with a grounded conductor, the screw shell of lampholders shall be connected to the grounded neutral.

(e) *Through feed arrangements.* Where a feeder supplies more than one distribution panel or panelboard, it may be continuous from the switchboard to the farthest panel or it may be severed at any intermediate panel. If the bus bars of any distribution panel or panelboard carry "through" load, the size of the buses should be designed for the

total current. The size of feeder conductors should normally be uniform for the total length but may be reduced at any intermediate distribution panel or panelboard provided that the smallest section of the feeder is protected by the overcurrent device at the distribution switchboard.

(f) *Circuits in vicinity of magnetic compass.* Precautions should be taken in connection with apparatus and wiring in the vicinity of the magnetic compass to prevent disturbance of the needle from external magnetic fields.

§ 111.50–5 Ship's service power circuits.

(a) *Segregation of vital circuits.* Power feeders supplying apparatus required for handling the vessel are not to be used for supplying apparatus which is to be disconnected when the vessel is underway unless the branch circuits for the latter are so arranged that they may be disconnected at panelboards without interfering with the operation or protection of those circuits necessary for the safe operation of the vessel. In general, separate feeders should be run for such groups as engine room and fire room auxiliaries, motors for cargo handling gear, radio transmitters, arc searchlights and ventilation sets.

(b) *Passenger vessels.* On passenger vessels constructed with fire screen bulkheads forming fire zones, distribution systems shall be so arranged that fire in any main fire zone will not interfere with essential services in any other main fire zone. This requirement will be met if main and emergency feeders passing through any zone are separated both vertically and horizontally as widely as is practicable.

(c) *Ventilation systems.* Cargo ventilation fans, machinery spaces ventilation fans, and accommodation ventilation fans shall, if practicable, be supplied by separate feeders. All electrical ventilation systems shall be provided with remote control means for stopping the motors in case of fire or other emergency. For the machinery space ventilation, there shall be provided a control located in the passageway leading to, but outside of, the space. For all other ventilation systems there shall be provided two emergency stop stations. One of these stations shall be in the wheelhouse, fire control room, the inside passageway near the wheelhouse door, or in an accessible position in the passageway leading to, but outside of, the space ventilated. The second emergency stop station shall be located as distant as practicable from the other, except that the ventilation circuit breakers at the main ship's service switchboard may be considered as the second station provided all are grouped together and are conspicuously marked "In Case of Fire Trip To Stop Ventilation." The means provided for stopping ventilation fans from the main ship's service switchboard shall not interfere with power to other circuits. The remote emergency stop stations shall be protected by enclosures with glass paneled doors on the front of which shall be marked "In Case of Fire Break Glass and Operate Switch to Stop Ventilation." Each control switch shall have the "stop" position clearly identified and shall be provided with a nameplate identifying the system with which it is associated. This remote control system shall be of the undervoltage protection type and so arranged that damage to the master switch or cable will automatically stop the fans. For automatic shutdown of mechanical ventilation in spaces protected by a carbon dioxide fire extinguishing system, see Part 34 of Subchapter D (Tank Vessels), Part 76 of Subchapter H (Passenger Vessels), and Part 95 of Subchapter I (Cargo and Miscellaneous Vessels) of this chapter.

(1) The requirements of this paragraph shall not be construed to include a closed ventilation system for a motor or generator, diffuser fans for refrigerated spaces, room circulating fans, or exhaust fans for private toilets of an electrical rating comparable to that of room circulating fans.

(d) *Steering gear circuits.* Electric and electro-hydraulic steering gear shall be served by two circuits from the ship's service switchboard except in special cases where the length of circuit is very short. One of the circuits may be taken from the emergency switchboard if the rating of the emergency generator is sufficient to supply the steering gear in addition to the emergency loads. The circuits shall be separated throughout their length as widely as practicable. Each circuit shall have adequate current-carrying capacity for supplying all motors and control equipment normally connected to it and which operate simultaneously.

(e) *Fuel oil service pump branch circuits.* For remote shut-down requirements for fuel oil service systems, see Part 55 of Subchapter F (Marine Engineering) of this chapter.

(f) *Tank vessels.* For special requirements for tank vessels see Subpart 111.70 of this part.

§ 111.50–10 Lighting feeders.

(a) *Passenger quarters, crew quarters, and public spaces.* On passenger vessels constructed with fire screen bulkheads forming fire zones, the lighting distribution system shall be so arranged that fire in any main fire zone will not interfere with the lighting in any other main fire zone. This requirement will be met if main and emergency feeders passing through any zone are separated both vertically and horizontally as widely as is practicable.

(b) *Machinery spaces.* Lighting for engine rooms, for the boiler rooms, and for the auxiliary machinery spaces shall, where practicable, be supplied from two or more feeders, one of which may be an emergency feeder.

(c) *Cargo spaces.* Separate feeders shall be provided for cargo space lighting. The distribution panels shall be located outside of the cargo spaces.

(d) *Emergency lighting feeders.* (1) For vessels provided with fire screen bulkheads forming fire zones, at least one emergency lighting feeder shall be provided to supply only the emergency lights between two adjacent main vertical fire zone bulkheads. The emergency lighting feeder shall be separated as widely as possible from the general lighting feeder(s) supplying the same space.

(2) On vessels fitted with an automatic emergency lighting and power system, a separate emergency lighting feeder shall be provided for emergency lights located in, or controlled from, the wheelhouse. A distribution panel for these lights with a fused switch or circuit breaker for each branch circuit shall be provided. Circuits to navigation lights not controlled by the navigation light panel, signal lights, and emergency lights on open decks, wheelhouse, chart room and fire control room shall be supplied from this wheelhouse distribution panel. The supply to the navigation light indicator panel shall be either a separate circuit from the emergency switchboard or a through feed, without switch or overcurrent protection, from the feeder supplying the wheelhouse emergency lighting panel. For overcurrent protection of the feeder supplying a navigation light panel see § 111.55–1(b)(9).

(3) On vessels provided with both a temporary and a final emergency lighting source of supply, a separate feeder to the wheelhouse shall be provided for the lifeboat floodlights. This feeder shall supply a distribution panelboard having a fused switch or circuit breaker for each branch circuit. This feeder may be connected to the final emergency lighting source of supply. On vessels without a temporary source of supply, these lights, when provided, may be supplied by the same feeder as other lights controlled from the wheelhouse.

§ 111.50–15 Lighting branch circuits and lighting requirements.

(a) *General requirements, branch circuits*—(1) *Passageways, public spaces, etc.* The supply to lights in passageways, public spaces, and berthing compartments accommodating more than 25 persons shall be divided between 2 or more branch circuits, one of which may be an emergency.

(2) *Machinery spaces.* Where practicable alternate groups of lights in an engine room, a boiler room, and an auxiliary machinery space shall be arranged so that the failure of one branch circuit will not leave large areas in darkness.

(3) *Lifeboat floodlights.* The arrangement of branch circuits to lifeboat floodlights required by paragraph (e) of this section shall be such that the floodlights at adjacent lifeboats are supplied by different branch circuits.

(4) *Signaling lamp circuit.* A separate branch circuit shall be provided to supply the signaling lamp(s) required by Subpart 113.60 of this subchapter. The branch circuit shall be supplied either from the emergency lighting panel required by subparagraph (d)(2) or from the final emergency source of emergency lighting and power as provided for in § 112.15–5(h) of this subchapter, or from a source as approved in the case of vessels not fitted with an emergency lighting and power system.

(b) *General lighting requirements*—(1) *Crew spaces and work spaces.* All spaces where members of the crew are regularly employed or quartered shall be adequately lighted. The minimum standard for natural lighting is that it will be possible on a clear day to read print such as that of an ordinary newspaper in any part of the clear working space. When it is not possible to provide adequate natural lighting, artificial lighting may be accepted on the same basis.

(2) *Washrooms, toiletrooms, etc.* Washrooms, toiletrooms, and hospital spaces are in particular to be well lighted.

(3) *Artificial lighting.* In every space apportioned to the crew, provision shall be made for efficient illumination at night and in dull weather by artificial lighting.

(4) *Berth lights.* Special provisions shall be made for berth lights for each member of the crew.

(c) *Berth lights.* Berth lights shall be permanently mounted and wired without the use of portable cords. The berth light shall have a minimum horizontal projection so that it will be difficult completely to cover the light with bedding.

(d) *Exit lights.* (1) Exit lights are required by § 78.47-40 of Subchapter H (Passenger Vessels) and Part 95 of Subchapter I (Cargo and Miscellaneous Vessels) of this chapter.

(2) The word "Exit" shall be in red block letters not less than 2 inches high and of such type that it can be seen from a distance.

(e) *Lifeboat floodlights.* (1) Illumination for lifeboat launching operations is required by Part 33 of Subchapter D (Tank Vessels), Part 75 of Subchapter H (Passenger Vessels) and Part 94 of Subchapter I (Cargo and Miscellaneous Vessels) of this chapter.

(2) Lifeboat floodlights shall be arranged so that the floodlights may be quickly directed either to the launching gear or to the lifeboat alongside. Means of training the floodlights shall be positive and shall not require the use of tools. The floodlights shall be connected to the supply circuit by means of a short length of heavy duty portable cord, Type S or the equivalent, and no receptacle outlet shall be employed.

(3) Vessels having liferafts, authorized in lieu of lifeboats for which approved launching devices are provided, shall be fitted with floodlights for illuminating the liferafts, launching devices, and water into which the liferafts are launched. Such floodlights shall be arranged as required by subparagraph (2) of this paragraph for lifeboats. Means shall also be provided for illuminating the stowage position of liferafts for which approved launching devices are not provided.

(f) *Receptacle outlets.* (1) A sufficient number of receptacle outlets shall be located throughout crew's accommodations to permit the use of electric razors, radios, and the like without using portable cords of excessive length.

(2) A sufficient number of receptacle outlets shall be located throughout the machinery spaces to permit lighting of any machine vital to the operation of the vessel with a portable light having a 75-foot portable cord. The requirements of this subparagraph shall be effective on vessels contracted for on or after November 19, 1956.

(g) *Pilot ladders.* Means shall be provided and used on all vessels engaged on voyages in which pilots are likely to be embarked at night for illuminating the pilot ladders.

§ 111.50-20 Circuit loads and demand factors.

(a) *General.* Generator, feeder and bus-tie cables shall be selected on the basis of a computed load of not less than the demand load given in Table 111.50-20(a).

TABLE 111.50-20 (a)—DEMAND LOADS

Type of circuit	Demand load
Generator cables..	125 percent of continuous generator rating.
Switchboard bus-tie, except ship's service to emergency switchboard bus-tie.	75 percent of generating capacity of the larger switchboard.
Emergency switchboard bus-tie.	125 percent of continuous rating of emergency generator.
Feeder supplying two or more motors.	125 percent of the rating of the largest motor plus 100 percent of the sum of the ratings of all other motors supplied and including 50 percent of the rating of the spare switches or circuit breakers on the distribution panel.[1]
Feeder supplying two or more cargo winch motors arranged for the "Burtoning" method of cargo handling.	125 percent of the rating of the largest motor plus 35 percent of the sum of the ratings of all other motors supplied.[1]
Feeder supplying two or more 'tween deck cargo winch motors, cargo elevator motors, or cargo cranes.	125 percent of the rating of the largest motor plus 50 percent of the sum of the ratings of all other motors supplied.
Galley equipment feeder.	100 percent of either the first 50 KW or one-half the connected load, whichever is the larger, plus 65 percent of the remaining connected load, plus 50 percent of the rating of the spare switches or circuit breakers on the distribution panel.
Lighting feeder....	100 percent of the connected load plus the average active circuit load for the spare switches or circuit breakers on the distribution panels.
Grounded neutral of a dual voltage feeder.	100 percent of the capacity of the ungrounded conductors when grounded neutral is not protected by a circuit breaker overcurrent trip, or not less than 50 percent of the capacity of the ungrounded conductors when the grounded neutral is protected by a circuit breaker overcurrent trip.

[1] Where a large number of motors are supplied from one feeder and the character of the load is such that not all motors will be operated simultaneously, a smaller demand load may be approved.

(b) *Motor branch circuits*—(1) *General.* The branch circuit cables for motor loads shall be not smaller than No. 14 AWG.

(2) *Individual motors.* Branch-circuit conductors supplying a single motor shall have a current carrying capacity not less than 125 percent of the motor full-load current rating. Minimum cable sizes are given in Table 111.45-20 (b3).

(3) *Wound-rotor secondary.* The conductors connecting the secondary of a wound-rotor alternating-current motor to its controller shall have a current carrying capacity not less than 125 percent of the full-load secondary current of the motor. Where the secondary resistor is separate from the controller, the current carrying capacity of the conductors between the controller and resistor shall be not less than 110 percent of the full-load secondary current.

(4) *Several motors.* Conductors supplying 2 or more motors shall have a current carrying capacity of not less than 125 percent of the full-load current rating of the highest rated motor in the group plus the sum of the full-load current ratings of the remainder of the motors in the group. Also see Table 111.50-20 (a).

(5) *Individual multi-speed motors.* For multi-speed motors the conductors between the controller and the motor windings or winding connections shall have a current-carrying capacity of not less than 125 percent of the full-load current rating of the associated winding or winding connection.

(c) *Lighting branch circuits*—(1) *General.* Lighting branch circuit conductors shall be not smaller than No. 14 AWG, except that taps to lampholders within a lighting fixture may be not smaller than No. 18 AWG where the branch circuit is protected by an overcurrent device rated or set at not more than 15 amperes.

(2) *15-ampere lighting branch circuits.* The connected load on a lighting branch circuit shall not exceed 12 amperes, computed on the basis of the lamp sizes to be installed, but in no case less than 50 watts per outlet unless the design of the fixture precludes the possibility of installing lamps of a higher wattage than those originally installed. Circuits supplying electric discharge type lamps shall be computed on the basis of ballast input current. Receptacle outlets provided for the convenience of passengers or crew to which no ship's service apparatus, such as room fans, desk lamps, table lamps, etc., will be connected, need not be counted as a connected load.

(3) *20-ampere lighting branch circuits.* Lighting branch circuits supplying only fixed nonswitched lighting fixtures for cargo hold or deck lighting may be supplied by 20-ampere branch circuits wired with not less than No. 12 AWG conductors provided all the following conditions are complied with:

(i) Fixture wire or portable cord, if employed in the lighting fixtures, shall not be smaller than No. 14 AWG.

(ii) The connected load shall not exceed 16 amperes.

(4) *30-ampere lighting branch circuits.* Lighting branch circuits supplying only fixed nonswitched lighting fixtures having only lampholders of the mogul type, or other lampholding devices required for lamps exceeding the maximum rating of medium-base lamps (300 watts), may be supplied by 30-ampere branch circuits wired with not less than No. 10 AWG conductors, provided all of the following conditions are complied with:

(i) Fixture wire, if employed, in wiring the lighting fixtures, shall be not less than No. 12 AWG.

(ii) The connected load shall not exceed 24 amperes.

(5) *Multi-lamp fixtures.* Multi-lamp fixtures employing a large number of low-wattage lamps, where the total load of the fixture exceeds 12 amperes, may be supplied by a polyphase branch circuit provided all the conditions covered in this subparagraph are complied with.

(i) The branch circuit is controlled from the distribution panelboard only by a common closing, common trip, circuit breaker having a pole for each circuit conductor.

(ii) The potential between any 2 conductors of the polyphase circuit does not exceed 120 volts.

(iii) The current in any conductor of the polyphase branch circuit does not exceed 12 amperes.

(d) *Appliance branch circuits.* Branch circuits which supply appliance loads, electric heater loads, and isolated small motor loads may be connected to distribution panelboards supplying lighting provided the required branch circuit capacity does not exceed 30 amperes.

(e) *Low voltage system, 0 to 50 volts—*(1) *Lighting.* Where a low voltage system is used for lighting, standard lamp sockets and receptacles shall be used, and no branch circuit is to be fitted with more than eight lamp sockets or receptacles. Each lighting branch circuit shall be wired with not less than No. 12 AWG conductors, and shall be protected by fuses of no greater capacity than 20 amperes, except that special circuits supplying appliances shall have receptacles of 20 ampere rating and shall be wired with not less than No. 10 AWG. Where a low voltage, low amperage system is used, such as for interior communication, no electrical connection is to be made to a standard voltage system unless specifically approved.

(2) *Engine starting.* Battery systems for engine starting purpose may be of the one-wire system. The ground lead shall be carried to the engine frame. Means shall be provided for removing the ground from the battery while the battery is being charged.

Subpart 111.55—Overcurrent Protection

§ 111.55–1 Installation of overcurrent devices.

(a) *General requirements.* Overcurrent protection for conductors is provided for the purpose of opening the electric circuit if the current reaches a value which will cause an excessive or dangerous temperature in the conductor or conductor insulation. A grounded conductor is considered to be protected from overcurrent if a protective device of a suitable rating or setting is provided in each ungrounded conductor of the same circuit, except as otherwise required by paragraph (d) of this section. For the minimum size of the grounded neutral conductor of a multiwire feeder see Table 111.50–20(a).

(b) *Overcurrent protection of conductors.* Conductors shall be protected in accordance with their current carrying capacities, as given in Tables 111.60–1 (e) (1) (i) and 111.60–1 (e) (1) (ii), except as follows:

(1) *Fuses.* If the allowable current-carrying capacity of the conductor does not correspond to a standard size fuse, the next larger size or rating may be used but not exceeding 150 percent of the allowable current-carrying capacity of the conductor. Plug fuses and fuseholders (see § 111.55–15(b)) shall not be used in circuits exceeding 125 volts between conductors. The screw shell of plug type fuseholders shall be connected to the load of the circuit.

(2) *Circuit breakers.* If the allowable current carrying capacity of the conductor does not correspond to a standard rating of circuit breakers, the next larger rating may be used but not exceeding 150 percent of the allowable current carrying capacity of the conductor. The effect of the temperature on the operation of thermally-controlled circuit breakers should be taken into consideration in the application of such circuit breakers when they are subjected to extremely low or extremely high temperatures.

(3) *Fixture wires or flexible cords.* Fixture wire or flexible cord, size No. 16 or No. 18, AWG, shall be considered as protected by 15-ampere overcurrent devices.

(4) *Motor branch circuits.* The conductors of motor branch circuits shall be considered as protected by the overcurrent protective devices specified by § 111.45–5 (b) through (g), and § 111.45–20.

(5) *Motor feeder circuits.* The conductor of motor feeder circuits shall be considered as protected by the overcurrent devices specified by § 111.45–25 (b).

(6) *Remote-control, electrical interlock, and indicator circuits.* The conductors of remote control, electrical interlock, and indicator circuits of motor controllers shall be considered as protected by the arrangements specified by § 111.45–10(b).

(7) *Appliance branch circuits.* The rating or setting of branch circuit overcurrent devices shall not be in excess of the current-carrying capacity of the circuit conductors except as provided in subparagraphs (1) and (2) of this paragraph. If the circuit supplies only a single appliance or device, the rating or setting of the branch circuit overcurrent device shall not exceed 150 percent of the rating of the appliance or device or 15 amperes whichever is the higher.

(8) *Lighting branch circuits.* Lighting branch circuits shall be protected against overcurrent either by fuses or by circuit breakers rated or set at not more than 15 amperes, except that 20-ampere lighting branch circuits complying with the provisions of § 111.50–20(c)(3) may be protected by overcurrent devices rated or set at no more than 20 amperes, and 30-ampere lighting branch circuits complying with the provisions of § 111.50–20(c)(4) may be protected by overcurrent devices rated or set at not more than 30 amperes, and low voltage lighting branch circuits may be protected in accordance with § 111.50–20(e).

(9) *Navigation light circuits.* The feeder supplying a navigation light panel shall be protected by overcurrent devices rated or set at not less than 30 amperes. The navigation light panel shall be fitted with 10-ampere main fuses and with 3-ampere branch circuit fuses as indicated on Figure 113.55–25 (b) of this subchapter.

(10) *Steering gear.* For overcurrent protection of steering gear branch circuits, see § 111.45–20 (h).

(c) *Thermal devices.* Thermal cutouts, thermal relays and other devices not designed to open short-circuits, shall not be used for protection of conductors against overcurrent due to short-circuits or grounds, but may be used to protect motor branch circuit conductors from overload if said devices are protected in accordance with § 111.45–5 (m).

(d) *Undergrounded conductors.* An overcurrent device (fuse or overcurrent trip unit of a circuit breaker) shall be placed in each undergrounded conductor, except that, on systems having a grounded neutral, a 2-wire branch circuit consisting of one ungrounded conductor and the grounded neutral conductor shall have overcurrent protection in each conductor. In such cases, the grounded neutral overcurrent device shall comply with paragraph (f) of this section. A branch or feeder switch or circuit breaker shall open all conductors of the circuit. Individual single-pole circuit breakers with operating handles yoked together may be used for the protection of each conductor of ungrounded 2-wire circuits.

(e) *Motors.* For motor-running protection the number of overcurrent units shall be as specified in § 111.45–5 (i), (j), and (k).

(f) *Grounded conductor.* No overcurrent device shall be placed in any permanently grounded conductor, except as permitted in this paragraph.

(1) *Simultaneous opening.* When the overcurrent device simultaneously opens all conductors of the circuit.

(2) *Motor-running protection.* For motor-running protection as provided in § 111.45–5 (i) and (j).

(g) *Protection of ship's service generators—*(1) *General.* Each generator of 25 kw. and over, and each generator regardless of size if arranged for parallel operation shall be protected by an individual trip-free air circuit breaker having inverse time overcurrent trips. The pickup setting of the long time overcurrent trip of the circuit breaker shall not exceed 115 percent of the generator rating for continuous rated machines and shall not exceed 15 percent above the overload rating for special rated machines. Each generator of less than 25 kw. not arranged for parallel operation may be protected by individual fuses in lieu of an individual circuit breaker.

(2) *Alternating current generators.* Where three or more generators are arranged for parallel operation, the circuit breakers shall have, in addition to

inverse time trips, instantaneous trips set at a value in excess of the maximum asymmetrical short circuit current available from the associated generator. In order to provide the optimum degree of protection for generators, the short time trips shall be set at the lowest values of current and time which will coordinate with the trip settings of feeder circuit breakers supplied by the generator to provide the continuity of service and high speed clearance specified in § 111.55–25.

(3) *Direct current generators.* In addition to the inverse time overcurrent trips, direct current generator circuit breakers shall be provided with an instantaneous trip set at the lowest value of current which will coordinate with the trip settings of feeder circuit breakers supplied by the generator to provide the continuity of service and high speed clearance specified in § 111.55–25.

(4) *Generator circuits for parallel operation.* Each direct-current generator arranged for parallel operaton shall be provided with a reverse current device. Each alternating-current generator arranged for parallel operation shall be provided with a reverse power relay.

(h) *Three-wire direct-current generators*—(1) *Circuit-breaker poles.* Separate circuit-breaker poles should be provided for the positive, negative, neutral and also for the equalizer leads unless protection is provided by the main poles. When equalizer poles are provided for the three-wire generators, the overload trips should be of the "Algebraic" type. No overload trip should be provided for the neutral pole, but it should operate simultaneously with the main poles. A neutral overcurrent relay and alarm system should be provided and set to function at a current value equal to the neutral rating.

(2) *Equalizer buses.* For 3-wire generators the circuit breaker shall protect against a short-circuit on the equalizer buses.

(3) *Neutral grounding, main switchboard.* The neutral of 3-wire dual-voltage direct-current systems should be solidly grounded at the generator switchboard with a zero center ammeter in the ground connection. The zero center ammeter shall have a full scale reading of 150 percent of the neutral current rating of the largest generator and be marked to indicate the polarity of grounds. The ground connection should be made in such a manner that it will not prevent checking the insulation resistance of the generator to ground before the generator is connected to the bus. The neutral of 3-wire d-c emergency power systems should be grounded at all times when supplied from the emergency generator or storage battery.

(4) *Neutral grounding, emergency switchboard.* No direct ground connection should be provided at the emergency switchboard, the neutral bus or buses being solidly and permanently connected to the neutral bus of the main switchboard. No interrupting device should be provided in the neutral conductor of the bus-tie feeder connecting the two switchboards.

(i) *Three-wire single-phase and four-wire three-phase generators*—(1) *Circuit-breaker poles.* Circuit-breaker poles shall be provided for each generator lead, including the neutral, except that where the generator disconnect switch is operable from the front of the switchboard, no generator circuit-breaker pole need be provided for the generator neutral.

(2) *Neutral grounding, main switchboard.* The neutral of dual-voltage alternating-current systems shall be solidly grounded at the generator switchboard with an ammeter in the ground connection. The ground connection shall be made in such a manner that it will not prevent checking the insulation resistance of the generator to ground before the generator is connected to the bus. The neutral of dual-voltage alternating-current emergency lighting and power systems shall be grounded at all times when supplied from the emergency generator or storage battery.

(3) *Neutral grounding, emergency switchboard.* The neutral bus of the emergency switchboard shall be grounded in the same manner as described for three-wire direct-current systems in paragraph (h) (4) of this section.

(j) *Propulsion circuits.* Overcurrent protection of propulsion motors, generators, and circuits will require special consideration in each case. For general requirements see § 111.35–25(j).

§ 111.55–5 Location of overcurrent protective devices.

(a) *Location in circuit.* Overcurrent devices shall be located at the point where the conductor to be protected receives its supply, except as covered in this paragraph.

(1) The overcurrent protective device for generator conductors shall be located on the generator switchboard.

(2) The overcurrent protection for shore connection conductors shall be located on the switchboard to which connected.

(3) If the overcurrent device protecting the larger conductors also protects the smaller conductors in accordance with Tables 111.60–1(e)(1)(i) and 111.60–1(e)(1)(ii).

(4) If (i) the smaller conductors have a current-carrying capacity of not less than the sum of the allowable current-carrying capacities for the conductors of the one or more circuits or loads supplied, and (ii) the tap is not over 5 feet long and does not extend beyond the switchboard, panelboard, or control device which it supplies.

(5) If the smaller conductors have a current-carrying capacity at least one-third that of the conductor from which they are supplied, and provided the tap is suitably protected from mechanical injury, is not over 25 feet long, and terminates in a single circuit breaker or set of fuses which will limit the load on the tap to that allowed by Tables 111.60–1(e)(1)(i) and 111.60–1(e)(1)(ii). Beyond this point the conductors may supply any number of circuit breakers or sets of fuses.

(b) *Location on vessel.* Overcurrent devices shall be located where they will be readily accessible; not exposed to mechanical injury; not in the vicinity of easily ignitable material nor where explosive gas or vapor may accumulate; and, preferably in combination with distribution panelboards, switchboards, motor controllers, etc.

§ 111.55–10 Enclosures for overcurrent protective devices.

(a) *General.* Overcurrent devices shall be enclosed in metal boxes or cabinets, unless a part of a specially approved assembly which affords equivalent protection, or unless mounted on switchboards, panelboards, or controllers located in compartments or enclosures free from easily ignitible material and accessible only to qualified persons. The operating handle of a circuit breaker may be accessible without opening a door or cover.

(b) *Exposed to weather.* Enclosures for overcurrent devices shall not be installed in locations exposed to the weather, unless unavoidable, in which case the enclosure shall be watertight.

(c) *Disconnection of fuses and thermal cutouts.* Disconnecting means shall be provided on the supply side of and adjacent to all cartridge fuses or thermal cutouts so that each individual circuit containing fuses or thermal cutouts can be independently disconnected from the source of electrical energy except as indicated in this paragraph.

(1) Instrument fuses located on switchboards operating at potentials not exceeding 600 volts need not have a disconnecting device provided a fuse puller is available.

(2) A single disconnecting means may be used to disconnect a group of circuits each protected by fuses or thermal cutouts under the conditions describe in § 111.45–30 (o).

(3) No disconnect means shall be provided for general alarm feeders and branch circuits covered by § 113.25–10(b).

(d) *Arcing or suddenly moving parts.* Arcing or suddenly moving parts shall comply with the requirements of this paragraph.

(1) Fuses and circuit breakers shall be so located or shielded that persons will not be burned or otherwise injured by their operation.

(2) Handles or levers of circuit breakers, and similar parts which may move suddenly in such a way that persons in the vicinity are liable to be injured by being struck by them, shall be guarded or isolated.

§ 111.55–15 Construction and use of overcurrent devices.

(a) *Fuse types prohibited.* Plug fuses of the Edison-base type and renewable link cartridge type fuses shall not be used.

(b) *Plug fuses and fuseholders of type S.* Plug fuses and fuseholders of type S may be employed for applications at not

over 125 volts; 0 to 15 amperes, and 16 to 30 amperes.

(c) *Cartridge fuses and fuseholders.* National Electrical Code Standard, nonrenewable cartridge fuses may be used for applications not exceeding 600 volts, 0 to 600 amperes. Special cartridge fuses may be used in instruments and the like when specifically approved.

(d) *Construction and marking of fuses.* Fuses shall be constructed in accordance with Underwriters' Laboratories, Inc., Standard for Fuses. Standard cartridge fuses shall be marked with the label of Underwriters' Laboratories, Inc. Special cartridge fuses shall be inspected under Underwriters' Laboratories, Inc., reexamination service.

(e) *Circuit breakers.* Circuit breakers shall conform to the requirements contained in this paragraph.

(1) *Method of operation.* In general, circuit breakers shall be capable of being closed or opened by hand without employing any other source of power, although normal operation may be by other power, such as electrical, pneumatic, and the like. Large circuit breakers which are to be closed and opened by electrical, pneumatic, or other power shall be capable of being closed by hand for maintenance purposes and shall also be capable of being tripped by hand under load without the use of power.

(2) *Injury to operator.* Circuit breakers shall be arranged and mounted so that their operation is not likely to injure the operator.

(3) *Indication.* Circuit breakers shall indicate whether they are in the open or closed position.

(4) *Non-tamperable.* An air circuit breaker, used for branch circuits, shall be of such design that any alteration of its trip point (calibration), or in the time required for its operation, will be difficult.

(5) *Marking.* Circuit breakers shall be marked with their rating in such a manner that the marking will be visible after installation.

(6) *Construction and interrupting rating.* The construction and rating of feeder and branch-circuit circuit breakers rated not more than 600 amperes and not more than 600 volts shall conform with the requirements of Underwriters' Laboratories, Inc., "Standard for Branch Circuit and Service Circuit Breakers" except as indicated in this subparagraph.

(i) Circuit breakers installed in engine rooms, boiler rooms and auxiliary machinery spaces shall be calibrated for an ambient temperature of 50° C. and circuit breakers so calibrated may be used in other locations.

(ii) Circuit breakers with interrupting ratings of over 10,000 amperes may be rated in accordance with the National Electrical Manufacturers Association's "Large Circuit Breaker Standard" or "Molded Case Circuit Breaker Standard," as applicable.

(7) *Removable from front.* Circuit breakers of the molded case type when installed on generator or distribution switchboards shall be mounted or arranged in such a manner that the circuit breaker may be removed from the front without first disconnecting copper or cable connections or deenergizing the supply.

§ 111.55–20 Interrupting rating of fuses and circuit breakers.

(a) *General.* Any circuit breaker or fuse installed at a point in the circuit where the maximum possible short-circuit current exceeds its interrupting rating shall be backed up by either, a circuit breaker of adequate interrupting rating with an instantaneous trip setting not more than 90 percent of the interrupting rating of the device protected, or by a suitable current limiting fuse. The back-up breaker or fuse nearest the source of power shall have an interrupting rating not less than the maximum short-circuit current available at the point where it is installed.

(1) *Current limiting fuses.* If a fuse is used as a back-up device, its selection and application shall be governed by the following design parameters:

(i) The maximum fuse rating shall be selected which will give adequate protection, on fault currents, to the device it backs up. In no case shall the device being backed up be called upon to interrupt fault currents in excess of 90 percent of its interrupting rating.

(ii) Fault currents cleared by the device backed up shall not cause damage or any change in the time-current characteristics of the current limiting fuse.

(iii) Fuses should be so applied that single phase operation of any three-phase connected motor will be precluded.

(2) *Fused circuit breakers.* Fused circuit breakers with fuses connected to the load side may be used for back-up service provided the fuses and circuit breakers are of coordinated design so that arc restrike in the circuit breaker cannot occur when a fuse blows.

(b) *Generator circuit breaker as back-up circuit breaker.* Generator circuit breaker(s) shall not serve as the back-up circuit breaker(s) for distribution or feeder circuit breakers.

(c) *Calculation of short-circuit currents.* Unless precise calculations are submitted for review, the maximum short-circuit current of a direct-current system will be assumed to be equal to ten times the combined normal rated current of all generators (including a spare) plus six times the combined normal rated current of all motors which may be in operation simultaneously. On alternating-current systems, the maximum short-circuit current will be assumed to be equal to ten times the combined normal rated current of all generators (including a spare) plus three times the combined normal rated current of all motors which may be in operation simultaneously.

§ 111.55–25 System protection.

(a) *General.* Insofar as is possible, the selection, arrangements and performance of the various overcurrent protective devices should be made with the following objectives in mind as described in this paragraph:

(1) *Continuity of service.* Continuity of service under short-circuit conditions through the selective operation of the various protective devices.

(2) *High speed clearance.* High speed clearance of low impedance short-circuits in order that short-circuit currents of large magnitude will cause minimum damage to the system and equipment and minimize the hazard of fire.

Subpart 111.60—Wiring Methods and Materials

§ 111.60–1 Electric cable.

(a) *General.* The intent and purpose of this section is to provide that conductors shall have mechanical strength, insulation, and current-carrying capacity adequate for the particular conditions under which they are used.

(b) *Construction.* Electric cables shall be constructed and tested by the manufacturer in accordance with the requirements of section 18, AIEE Standard No. 45.

(1) *Classes of cables.* The classes of cables covered by this standard are:

(i) Lighting and power cables;

(ii) Interior communication and telephone cable;

(iii) Inter-cabin telephone cable;

(iv) Bell wire; and,

(v) Switchboard wire.

(2) *Cable classes by type of insulation.* The above cables are classed in accordance with the type of conductor insulation as:

(i) Rubber insulated;

(ii) Varnished-cambric insulated;

(iii) Asbestos-varnished-cambric insulated;

(iv) Thermoplastic-asbestos insulated; and,

(v) Mineral insulated, Type MI.

(3) *Cable classes by type of mechanical covering.* The above cables are classed in accordance with the type of mechanical covering as:

(i) Armored;

(ii) Leaded and armored;

(iii) Impervious sheathed and armored;

(iv) Reinforced rubber sheathed and armored;

(v) Braided (applicable only to bell wire and switchboard wire); and,

(vi) Mineral insulated metal sheathed, Type MI.

(c) *Cable marking.* Cable complying with the requirements of this section shall be identified by providing a marker tape under the cable sheath. The marker tape shall give at regular and frequent intervals:

(1) Manufacturer;

(2) Applicable specification; and,

(3) Year of manufacture.

(d) *Cable applications*—(1) *Damp or wet locations.* Electric cable for installation in damp or wet locations shall be leaded and armored, reinforced rubber sheathed and armored, impervious sheathed and armored, or mineral insulated-metal sheathed. The cable insulation may be either rubber, varnished-cambric, asbestos-varnished-cambric, thermoplastic asbestos or mineral insu-

lated, type MI, except that rubber insulated power and lighting cable shall not be used in locations where the ambient temperature exceeds 50 degrees C.

(2) *Corrosive locations.* The armor of cables in corrosive locations shall be either bronze or aluminum and the sheath on mineral insulated-metal sheathed cables shall be seamless annealed copper.

(3) *Dry locations.* Cables for installation in dry locations shall be either rubber insulated and armored or any of the cables specified in subparagraph (1) of this paragraph for damp or wet locations.

(4) *Power and lighting cable.* Cable for power and lighting applications shall be power and lighting cable of the types described in this subpart except that 600-volt thermoplastic-asbestos insulated interior communication cable may be used in control and indicating circuits of power and lighting equipment.

(5) *Interior communication and telephone cable.* Cable for interior communication apparatus operating on potentials not exceeding 300 volts shall be either interior communication cable, telephone cable, or power and lighting cable of the types described in this subpart.

(6) *Inter-cabin telephone cable.* Inter-cabin telephone cable may be used for telephone systems installed for the convenience of passengers or crew and not essential for the operation of the vessel.

(7) *Bell wire.* Bell wire may be used for call bell circuits of 25 volts or less installed for the convenience of passengers or crew if properly installed in protected raceways.

(8) *Switchboard wire.* Switchboard wire may be used only on switchboards, motor controllers and the like.

(e) *Current-carrying capacity*—(1) *General.* The maximum current-carrying capacities of electric lighting and power cables for continuous service are given in Tables 111.60–1(e)(1)(i) and 111.60–1(e)(1)(ii). The maximum current-carrying capacity of interior communication cable is 7.5 amperes.

(2) *Conductors in multiple.* Conductors may be run in multiple provided they are of the same length and have the same circular mil area and type of insulation. Where conductors are run in multiple, they shall be arranged and terminated at both ends in such a manner as to insure equal division of the total current between all conductors that are involved.

(f) *Temperature limitation.* No cable shall be used under such condition that its temperature, even when carrying current, will exceed the temperatures specified in Table 111.60–1 (e) (1) (i) for the type of insulation involved.

(g) *Conductor size for varnished-cambric insulated cables.* Varnished-cambric insulated power and lighting cables in sizes smaller than No. 12 AWG shall not be used. Rubber or asbestos-varnished-cambric insulated power and lighting cables may be used in size No. 14 AWG and larger.

TABLE 111.60–1(e)(1)(i)—WIRES AND CABLES[1]—MAXIMUM CURRENT-CARRYING CAPACITIES, DIRECT-CURRENT, FOR CONTINUOUS SERVICE, 50 DEGREES C. AMBIENT[2,3] (CONCENTRIC STRANDING, 600 VOLTS[4] OR LESS, DIRECT-CURRENT), (ALTERNATING-CURRENT RATINGS FOR CABLES ARE THE SAME AS GIVEN FOR DIRECT-CURRENT UP TO 700,000 CIRCULAR MILS; FOR 700,000 CIRCULAR MILS AND ABOVE, SEE TABLE 111.60–1(e)(1)(ii))

Conductor size		Current in amperes											
		1—conductor				2—conductor				3—conductor			
Area (circular mils)	Nearest AWG	R	VC	AVC	MI	R	VC	AVC	MI	R	VC	AVC	MI
2,000,000	----	1,048	1,380	1,538	----	----	----	----	----	----	----	----	----
1,750,000	----	934	1,231	1,373	----	----	----	----	----	----	----	----	----
1,500,000	----	846	1,095	1,228	----	----	----	----	----	----	----	----	----
1,250,000	----	743	970	1,020	----	----	----	----	----	----	----	----	----
1,000,000	----	640	831	925	----	----	----	----	----	----	----	----	----
950,000	----	617	812	904	----	----	----	----	----	----	----	----	----
900,000	----	592	779	866	----	----	----	----	----	----	----	----	----
850,000	----	578	752	838	----	----	----	----	----	----	----	----	----
800,000	----	557	725	807	----	----	----	----	----	----	----	----	----
750,000	----	538	696	776	----	----	----	----	----	----	----	----	----
700,000	----	516	666	741	----	----	----	----	----	----	----	----	----
650,000	----	486	623	694	----	382	503	560	----	331	428	476	----
600,000	----	466	597	665	----	363	481	535	----	317	407	452	----
550,000	----	441	563	627	----	344	462	514	----	302	386	428	----
500,000	----	418	534	594	----	323	431	480	----	285	367	408	----
450,000	----	392	498	554	----	306	406	452	----	265	341	379	----
400,000	----	369	464	516	----	284	377	418	----	248	319	354	----
350,000	----	340	429	477	----	261	351	390	----	230	294	327	----
300,000	----	301	389	432	----	238	315	351	----	209	267	297	----
250,000	----	270	348	387	----	212	281	312	----	186	238	264	----
212,000	4/0	241	310	345	308	193	254	283	----	169	215	239	----
168,000	3/0	208	273	304	264	167	223	248	----	148	187	208	----
133,000	2/0	180	237	264	228	145	194	214	----	130	163	181	----
106,000	1/0	155	206	229	196	128	170	189	----	112	142	158	----
83,700	1	133	177	197	168	111	148	165	----	98	122	135	----
66,400	2	115	152	169	144	96	128	142	----	86	106	118	----
52,600	3	99	132	147	124	85	111	124	----	75	92	102	----
41,700	4	85	114	127	108	74	97	108	72	66	80	89	72
33,100	5	71	99	110	94	64	85	95	63	57	70	78	63
26,300	6	63	86	96	80	56	74	82	56	49	61	67	56
20,800	7	54	74	82	----	49	64	71	----	44	52	58	----
16,500	8	46	66	73	56	42	55	61	40	39	46	51	40
10,400	10	34	49	54	44	32	42	47	32	29	35	39	32
6,530	12	24	32	35	32	22	27	30	24	21	23	26	24
4,110	14	15	----	20	24	14	----	19	20	13	----	17	20

[1] The values given in this table may be used provided the cable installation is limited to double banking. Where this limitation is exceeded, the values given in this table shall be decreased 5 percent for each additional bank.

[2] The values given in this table are based upon an ambient temperature of 50 degrees C and maximum conductor temperature of:

75 degrees C for rubber (R) insulated cables;
85 degrees C for varnished-cambric (VC) insulated cables; mineral insulated (MI) cables; and
95 degrees C for asbestos-varnished-cambric (AVC) insulated cables.

[3] If ambient temperatures differ from 50 degrees C the value shown above shall be multiplied by the following factors:

Type of cables	Ambient temperature		
	40° C	60° C	70° C
Rubber insulated cables	1.18	----	----
Varnished-cambric insulated cables and mineral-insulated cables	1.13	0.84	----
Asbestos-varnished-cambric insulated cables	1.11	0.88	0.75

[4] For voltages greater than 600 volts, current rating shall be decreased 2 percent for each thousand volts increase over 600 volts.

TABLE 111.60–1 (e) (1) (ii)[1]—WIRES AND CABLES—MAXIMUM CURRENT-CARRYING CAPACITIES, A. C., FOR CONTINUOUS SERVICE (VALUES ARE IN AMPERES—600 VOLTS OR LESS) (ALTERNATING-CURRENT RATINGS FOR CABLES OF LESS THAN 700,000 CIRCULAR MILS ARE THE SAME AS THOSE FOR CABLES GIVEN IN TABLE 111.60–1 (e) (1) (i))

[60-cycle alternating current]

Conductor size	Concentrically stranded conductor			Annular conductor	
Area in circular mils	Rubber insulated	Varnished-cambric insulated	Asbestos-varnished-cambric insulated	Varnished-cambric insulated	Asbestos-varnished-cambric insulated
2,000,000	932	1,229	1,440	1,417	1,590
1,750,000	864	1,125	1,305	1,294	1,450
1,500,000	791	1,023	1,199	1,160	1,315
1,250,000	719	920	1,070	1,021	1,150
1,000,000	631	808	926	877	990
950,000	609	790	899	840	955
900,000	587	760	867	803	920
850,000	568	735	838	777	885
800,000	548	711	803	747	848
750,000	529	683	775	708	810
700,000	509	656	740	675	775

[1] Footnotes 1, 2, 3, and 4 of Table 111.60–1 (e) (1) (i) are applicable to this table.

(h) *Substitute cable.* Electric cable constructed in accordance with Military Specifications MIL–C–915 or MIL–C–2194 may be substituted for the equivalent AIEE type cable specified in this section. The maximum current for any conductor shall not exceed the current-carrying capacities specified in the publication "Cable Comparison Guide," NavShips 250–660–23.

(i) *Special purpose cable*—(1) *Instrumentation cable.* Electric cable constructed in accordance with Military Specifications MIL–C–915, MIL–C–2194 or MIL–C–23206 of the types TTHFWA, TTRSA, PI, 1SWA, 2SWA, 3SWA, may be used for instrumentation circuits to connect such items as indicator lights, sensors, selector switches, and pushbuttons where the voltage of the circuit does not exceed 100 volts. The maximum current for any conductor shall not exceed the current-carrying capacities specified in the publication "Cable Comparison Guide," NavShips 250–660–23.

(2) *Thermocouple cable.* Electric cable constructed in accordance with Military Specification MIL–C–915 of the types PBJX, PBTM and PBTX may be used as conductors between thermocouple sensors and their registering equipment.

(3) *Other types of cable.* Other types of cable will be given special consideration by the Commandant where the cable does not penetrate a watertight bulkhead and is suitably protected from mechanical damage.

§ 111.60–5 Portable electric cord and fixture wire.

(a) *General.* The construction of portable electric cords and fixture wire shall be in accordance with Underwriters' Laboratories, Inc., Standard for Flexible Cord and Fixture Wire.

(b) *Application, portable cords.* Portable cords may be used only for the connection of portable lamps or appliances and for the connection of stationary lamps or small stationary equipment not suitable for fixed wiring. When used they shall be of the type indicated in Table 111.60–5 (b). Types of portable cords other than those listed in Table 111.60–5 (b) and the uses for the types listed other than those uses permitted by this paragraph shall be subject to special investigation and shall not be employed before being approved.

(1) *Damp or wet locations or for hard service.* Portable cords for use in damp or wet locations or for hard service shall be type S, SO, ST, SJ, SJO, SJT, HS, HSJ, AFS, or AFSJ, and portable cords for use where exposed to oil or oil vapor shall be type SO or SJO.

(2) *Dry locations.* Portable cords for use in dry locations and not for hard services shall be type C, P, P–2, PD, PW, PW–2, K, HC, HPD, AVPD, or one of the types listed for damp or wet locations in subparagraph (1) of this paragraph.

(3) *Extra hard service.* Portable cords for use in damp or wet locations and requiring a length in excess of five feet shall be type S, SO, or ST.

(c) *Allowable current-carrying capacity.* The allowable current-carrying capacities of flexible cord and fixture wire are given in Table 111.60–5 (c).

(d) *Conductor size.* Portable cord or fixture wire shall not be smaller than No. 18 AWG.

(e) *Splices.* Portable cords shall be used only in continuous lengths without splices or taps.

(f) *Pull at joints and terminals.* Portable cords shall be so connected to devices and to fittings that tension will not be transmitted to joints or terminal screws. This shall be accomplished by a knot in the cord, winding with tape, by a special fitting designed for that purpose, or by other equivalent means.

(g) *Fixture wire, application.* Fixture wire may be used in the interior of lighting fixtures, instruments, and the like. When used, fixture wire shall be one of the types covered in this paragraph.

(1) Either type AF, SF–2, or SFF–2 fixture wire shall be used for applications where the temperature will exceed 90° C and for the wiring of all mogul-base screw-shell lampholders.

(2) Either type AF, SF–2, or SFF–2 fixture wire shall be used for wiring lighting fixtures provided with other than mogul-base screw-shell lampholders, except that type CF fixture wire may be used where the temperature does not exceed 90° C, types RFH–2 and FFH–2 fixture wire may be used where the temperature does not exceed 75° C, and types TF, TFF, RF–2, and FF–2 fixture wire may be used where the temperature does not exceed 60° C.

(h) *Fixture wire, voltage limitation.* Fixture wire shall not be used for applications exceeding 300 volts.

(i) *Fixture wire, stranded.* Fixture wire shall be of the stranded type.

(j) *Hook-up wire, application.* Hook-up wire for use within the components of alarm panels, IC equipment, and electronic control equipment shall be in accordance with § 113.05–10 of this subchapter.

TABLE 111.60–5 (b)—Portable Cords

Trade name	Type letter (National Electrical Code)	Maximum voltage	Conductor insulation	Braid on each conductor	Cord outer covering	Maximum temperature °C.	Use	
Lamp cord	C	300	Rubber	Cotton	None	60	Dry places	Not hard usage.
Twisted portable cord	PD	300	do	do	Cotton or rayon	60	do	Do.
Reinforced cord	P–2	300	do	do	Cotton over rubber filler	60	do	Do.
	P	600						
Moistureproof reinforced cord	PW–2	300	do	do	Cotton, moisture-resistant finish over rubber filler.	60	do	Do.
	PW	600						
Braided heavy duty cord	K	300	do	do	Two cotton, moisture-resistant finish.	60	do	Do.
Junior hard service cord	SJ	300	do	None	Rubber	[1] 60	Damp places	Hard usage.
	SJO		Thermoplastic or rubber.		Oil-resistant compound			
	SJT				Thermoplastic			
Hard service cord	S	600	Rubber		Rubber	60	do	Extra hard usage.
	SO		Thermoplastic or rubber.	do	Oil-resistant compound			
	ST				Thermoplastic			
Heater cord	HC	300	Rubber and asbestos	Cotton	None	90	Dry places	Not hard usage.
	HPD			None	Cotton or rayon			
Rubber-jacketed heater cord	HSJ	300	do	do	Cotton and rubber	[2] 90	Damp places	Hard usage.
Jacketed heater cord	HS	300	do	do	Cotton, and rubber or neoprene	[2] 90	do	Do.
Heat- and moisture-resistant cord.	AVPD	300	Asbestos and varnished cambric.	do	Asbestos, flame-retardant, moisture resistant.	110	Dry places	Not hard usage.
Rubber-jacketed heat-resistant cord.	AFSJ, AFS	300	Impregnated asbestos	do	Rubber	[3] 150	Damp places	Hard usage.
Elevator cable	E	300	Rubber	Cotton	Three cotton, outer one flame-retardant, moisture-resistant.[4]	60	Elevator lighting and control.	
	EO		Thermoplastic	Rayon	One cotton and neoprene jacket [4]			
	ET				Three cotton, outer one flame-retardant, moisture-resistant.[4]			

[1] The temperature limit for Type SJ, SJO, or SJT cord is 75° C instead of 60° C if both the conductor insulation and jacket employ compounds which are recognized as suitable for use at 75° C. Such cords are recognized specifically for use on electric refrigerators or in similar applications on appliances where cord replacement is not a problem. Such cords shall be marked by having a green thread (which indicates a temperature limit of 75° C) either immediately under the insulation or under the separator of one conductor.

[2] The temperature limit indicated applies only to the individual conductors where the cord is employed within an appliance. The temperature limit on the jacket of Type HS rubber-jacketed heater cord and Type AFS or AFSJ rubber-jacketed heat-resistant cord is limited to 75° C. The temperature limit on the jacket of Type HSJ rubber-jacketed heater cord is limited to 60° C, unless the jacket is marked by means of indent printing or indelible-ink printing at intervals of two feet or less with the value 75° C.

[3] Rubber-filled or varnished-cambric tapes may be substituted for the inner braids.

TABLE 111.60-5 (c)—MAXIMUM CURRENT-CARRYING CAPACITIES IN AMPERES[1, 2]

Size AWG	Portable cord				Fixture wire	
	Rubber types C, E, EO, K, P, P-2, PD, PW, PW-2	Rubber types S, SO, SJ, SJO	Types AFS, AFSJ, HC, HPD, HS, HSJ	Type AVPD	Rubber types RF-2, FF-2, RFH-2, FFH-2	Thermoplastic types TF, TFF
	Thermoplastic type ET	Thermoplastic types ST, SJT				Cotton type CF
						Asbestos type AF
						Silicone rubber type SF-2 SFF-2
18	5	7	10	17	5	6
16	7	10	15	22	7	8
14	15	15	20	28	.....	17
12	20	20	30	36	.....	.....
10	25	25	35	47	.....	.....
8	35	.....	.....	.....	.....	.....
6	45	.....	.....	.....	.....	.....
4	60	.....	.....	.....	.....	.....
2	80	.....	.....	.....	.....	.....

[1] If the number of current-carrying conductors in a cord exceeds three, the allowable current-carrying capacity of each conductor shall be reduced to 80 percent of the values in the table.
[2] In no case shall conductors be associated together in such a way with respect to the kind of circuit, the wiring method employed, or the number of conductors, that the limiting temperature of the conductors will be exceeded.

§ 111.60–10 Wire and cable installation.

(a) *Propulsion cables*—(1) *Splices and terminals.* Propulsion cables are to have no splices or joints except terminal joints and all cable terminals are to be effectively sealed against the admission of moisture or air; similar precautions should be taken during installation by sealing all cable ends until the terminals are permanently attached. Cable supports are to be strong enough to withstand short-circuited conditions; they are not to be spaced more than 36 inches apart and are to be arranged to prevent chafing of the cable.

(2) *Single-conductor alternating-current cables.* Single-conductor alternating-current cables are to be supported on non-fragile insulators and the protective metal covering of each run of cable should be grounded at the middle only. Closed magnetic circuits around individual cables are not permitted and magnetic materials between cables of a group should be avoided. In order to minimize harmful inductive effect, cables in groups of considerable length should be transposed.

(3) *Multi-conductor alternating-current cables.* Multi-conductor alternating current cables are to be mounted on approved supports and the lead sheath grounded at several points.

(4) *Deck and bulkhead penetrations.* Deck and bulkhead penetration shall comply with the requirements of paragraph (b) (4) of this section.

(b) *Ships' service cables*—(1) *Cable joints and sealing.* The cable ends of all feeders and power branch circuits to vital auxiliaries are to be effectively sealed against the admission of moisture by methods such as taping in combination with insulating compound or, in the case of type MI, by fittings designed for that purpose.

(2) *Cable supports and radii of bends.* Where cables are run in groups they shall be supported in metal hangers arranged as far as practicable to permit painting of the surrounding structure without undue disturbance to the installation. Single cable runs may be supported by metal clips screwed directly to deck or bulkhead except on watertight bulkheads. Cables grouped in a single hanger shall be limited to two banks. Supports shall be spaced no more than 18 inches apart where vertical and 14 inches where horizontal. Cables shall be strapped in position at every hanger on vertical runs and at not less than every fourth hanger on horizontal runs, except that at turns of horizontal runs the cable shall be strapped at each hanger. Cables running transversely to and supported by clips or straps on the under side of beams shall be run on backing plates, cable racks, or the equivalent. Metal supports shall be designed to secure cable without damage to insulation or armor and shall be so arranged that the cables will bear over a length of at least ½ inch. Leaded and armored cables shall not be bent to a smaller radius than 8 cable diameters; other cables may be bent to a 6-cable-diameter radius.

(3) *Alternating-current cable installations.* In order to avoid over-heating by induction, all phase wires should be contained within the same armor by use of multiple conductor cables. Single-conductor cables may be used, however, where carrying negligible currents or where there are no closed magnetic circuits around the individual cables.

(4) *Deck and bulkhead penetrations.* Where cables pass through watertight decks or bulkheads, a watertight stuffing tube shall be employed. Where cables pass through nonwatertight bulkheads, beams, or similar structural parts where the bearing surface is less than ¼-inch, the holes shall be fitted with bushings having rounded edges and a bearing surface for the cable of at least ¼-inch in length. Where cables pass through nonwatertight bulkheads, deck beams, or similar structural parts where the bearing surface is ¼-inch or greater in length, all burrs shall be removed in way of the hole and sharp edges shall be eliminated. Where cables pierce main vertical zone bulkheads, arrangements shall be made to ensure that the fire-resistance of the bulkheads is not impaired.

(5) *Grounding of cable metallic covering.* Each metallic-sheathed cable and each armored cable are to have the metallic covering electrically and mechanically continuous and grounded to the metal hull at each end of the run, except that final subcircuits may be grounded at the supply end only.

(6) *Mechanical protection.* All cables in bunkers and where particularly liable to damage such as locations in way of cargo ports, hatches, tank tops, and where passing through decks, shall be protected by removable metal coverings, angle irons, pipe or other equivalent means. All such metallic coverings are to be electrically continuous and grounded to the metal hull. Horizontal pipes or the equivalent used for cable protection should be provided with drainage holes, and, where they are carried through decks or bulkheads, arrangements should be made to insure the integrity of the water-or-gas-tightness of the structure.

(7) *Generator cables.* Generator cables are not to be installed in the bilges.

(8) *Feeder and branch circuit cables.* Cable of every description shall be located with a view to avoiding, as far as practicable, spaces where excessive heat and gases may be encountered as well as spaces where they may be exposed to damage such as exposed sides of deck houses. Electrical conductors shall not enter oil tanks and shall avoid cofferdams adjacent to and extending below the tops of oil tanks except as permitted by §§ 111.70–10 and 111.60–40.

(9) *Cables behind paneling.* Cables may be installed behind paneling provided all connections are readily accessible and the location of concealed connection boxes is indicated.

(10) *Cables behind sheathing.* Cables may be installed behind sheathing but they must not be installed behind nor imbedded in structural insulation; they should pass through such insulation at right angles and should be protected by continuous pipe with a stuffing tube at one end. For deck penetrations this stuffing tube should be at the upper end of the pipe and for bulkhead penetrations it should be on the uninsulated side of the bulkhead. For refrigerated space insulation the pipe should be of a phenolic or similar heat insulating material joined to the bulkhead stuffing tube or a section of such material should be inserted between the bulkhead stuffing tube and the metallic pipe.

(11) *Bell wire.* Bell wire may be run in tubing or moulding or the equivalent. All splices are to be made at outlets or connection boxes.

(12) *Lightning ground conductor.* Lightning ground conductor should be fitted to each wooden mast or topmast. They need not be fitted to steel masts.

§ 111.60–15 General requirements for wiring methods.

(a) *Feeder and branch continuity.* Each feeder and each branch circuit cable supplying a single energy consuming appliance, shall be continuous throughout their lengths, except that a cable of large size or exceptional length may be spliced in a suitable junction box to effect greater ease of installation and except for cables that may be extended as permitted by paragraph (f) of this section.

(b) *Boxes at outlets.* An outlet box shall be installed at each outlet, switch, receptacle, or junction point. In the complete installation, each outlet or junction box shall be provided with a cover unless a fixture canopy, switch cover, receptacle cover, etc., is used.

(c) *Cables entering boxes.* Cables entering boxes or fittings shall be protected from abrasion, and shall conform to the requirements of this paragraph.

(1) Opening through which conductors enter shall be adequately closed.

(2) The cable armor shall be secured to the box or fitting.

(3) In damp or wet locations, the cable entrance shall be made watertight by means of a terminal or stuffing tube, except that cables entering the bottom of drip-proof enclosures need not be made watertight.

(d) *Splices and taps.* (1) Conductors shall be so spliced or joined as to be mechanically and electrically secure without solder and, unless an approved splicing device is used, shall then be either soldered with a fusible metal or alloy, or brazed or welded. All splices and joints shall be covered with an insulation equivalent to that on the original conductor.

(2) If not subjected to a temperature higher than 75 degrees C, a splice or joint shall be covered with rubber or thermosplastic tape secured in place by an outer winding of friction tape, or with a standard combination tape or as specified in subparagraph (3) or (4) of this paragraph.

(3) If subjected to a temperature higher than 75 degrees C but not higher than 90 degrees C, a splice or joint shall be covered with asbestos cord or tape secured in place by an outer winding of friction tape or bonded with water-glass (sodium silicate) or as specified in subparagraph (4) of this paragraph.

(4) If subjected to a temperature higher than 90 degrees C, a splice or joint shall be covered with asbestos cord or tape bonded with water-glass.

(5) Other methods of insulating splices and taps, such as wrapping with layers of varnished-cambric tape followed by painting with insulating varnish, when properly done, are also acceptable.

(6) Rubber and thermoplastic insulating tapes shall be of a type listed as approved by Underwriters' Laboratories, Inc.

(e) *Connections to terminals.* (1) Connection of conductors to terminal parts shall insure a thoroughly good connection without damaging the conductors and shall be made by means of pressure connectors, solder lugs, or splices to flexible leads either soldered, brazed, or welded, except that No. 10 or smaller conductors may be connected by means of clamps or screws with terminal plates having upturned lugs. Terminals for more than one conductor shall be of a type approved for that purpose.

(2) Connectors, or lugs of the set-screw type shall not be used with stranded conductors smaller than No. 14 AWG unless provided with a nonrotating follower traveling with the set screw and making pressure contact with the conductor.

(3) Pressure-type wire connectors, fixture splicing connectors, and lugs shall conform to the requirements of Underwriters Laboratories, Inc., Standard for Wire Connectors and Soldering Lugs, and shall be so listed by Underwriters Laboratories, Inc.

(4) Terminal blocks shall employ terminal screws not smaller than 6–32, and spacings not less than that shown in Table 111.60–15 (e) (4).

TABLE 111.60–15 (e) (4)—Terminal Block Spacings

Voltage involved	Minimum spacings in inches between parts of opposite polarity and between live parts and ground	
	Through air	Over surface
0–250	1/4	3/8
251–600	3/8	3/8

(f) *Extending feeder and branch circuit cables.* Existing feeder and branch circuit cables may be extended for vessels receiving major alterations provided the requirements of this paragraph are met.

(1) The cables shall be spliced in suitable junction boxes.

(2) Each vital and emergency circuit shall be spliced in individual, suitable junction boxes.

(3) Circuits of different voltages shall not be extended by means of a common cable or junction box.

(4) Existing cables of less than 25 feet in length shall not be extended but shall be replaced.

§ 111.60–20 Outlet boxes.

(a) *General.* The requirements of this section are applicable to outlet boxes for use with lighting fixtures, wiring devices, and the like, including separately installed connection and junction boxes, having a volume of not more than 100 cubic inches. Boxes of large size will require special consideration.

(b) *Size.* Outlet boxes shall have an internal depth of at least 1½ inches, except that when an outlet box is incorporated in a fixture the depth may be decreased to not less than 1 inch provided the outlet box volume is not less than 20 cubic inches. The free space within an outlet box for each conductor, not counting fixture wires, shall be not less than that given in Table 111.60–20 (b). Table 111.60–20 (b) applies where no fitting or devices, such as cable clamps, hickeys, switches or receptacles are contained in the box. Where one or more such devices are contained in the box, each such device shall count as one conductor. Each conductor terminated in the box is counted as one conductor.

TABLE 111.60–20 (b)—Outlet Box Size

AWG size of conductor, No.	Free space in cubic inches for each conductor within box
14	2.0
12	2.25
10	2.5
8	3.0

(c) *Degree of enclosure.* Outlet boxes for use in damp or wet locations shall be of watertight construction.

(d) *Mounting and grounding.* Outlet boxes shall be securely fastened in place and grounded to the hull of the vessel. Outlet boxes of watertight construction shall have external mounting feet or lugs.

(e) *Penetration of walls.* Holes in the walls of watertight outlet boxes for the purpose of providing means for the attachment of parts on the exterior or interior thereof, or for securing the cover and the like, shall not penetrate the total thickness of the box wall.

(f) *Construction.* The construction of outlet boxes shall conform with the requirements of Underwriters' Laboratories, Inc. Standard for Outlet Boxes and Fittings, except that sheet steel outlet boxes shall not be installed in corrosive locations.

§ 111.60–25 Switches and circuit breakers.

(a) *General requirements*—(1) *Grounded conductor.* No switch or circuit breaker shall disconnect the grounded conductor of a circuit unless the switch or circuit breaker simultaneously disconnects the ungrounded conductor or conductors.

(2) *Three-way and four-way switches.* Three-way and four-way switches shall be so wired that all switching is done only in the ungrounded circuit conductor.

(3) *Enclosures.* Switches and circuit breakers, except pendant and surface type snap switches and knife switches mounted on an open face switchboard or panelboard, shall be of the externally operative type enclosed in metal boxes or cabinets.

(4) *Position of knife switches.* Single-throw knife switches shall be so placed that gravity will not tend to close them. Double-throw knife switches may be mounted so that the throw will be either vertical or horizontal as preferred, but if the throw be vertical a locking device shall be provided which will insure the blade remaining in the open position when so set.

(5) *Circuit connections.* Knife switches, unless of the double-throw type, shall be so connected that the blades are dead when the switch is in the open position. Circuits shall be connected to the fuse end of switches and to the coil end of circuit breakers, except that generators or incoming feeders may

be connected to either end of circuit breakers.

(6) *Accessibility and grouping.* Switches and circuit breakers, so far as practicable, shall be readily accessible and shall be grouped.

(7) *Circuit breakers as switches.* A circuit breaker operable directly by applying the hand to a lever or handle may serve as a switch provided it has the number of poles required for such switch.

(8) *Grounding of enclosures.* Enclosures for switches or circuit breakers shall be grounded.

(9) *Knife switches.* Knife switches rated for more than 1,200 amperes at 250 volts or less, and for more than 600 amperes at 251 to 600 volts shall be used only as isolating switches and shall not be opened under load. To interrupt currents greater than 1,200 amperes at 250 volts or less, or 600 amperes at 251 to 600 volts, a circuit breaker or a switch of special design approved for such purpose shall be used. Knife switches of lower rating may be used as general-use switches and may be opened under load. Motor-circuit switches may be of the knife-switch type. (See § 111.45–30 (d), (e), and (f).)

(10) *Rating of snap switches.* Snap switches shall be rated as described in this paragraph depending upon the load controlled.

(i) *Non-inductive loads.* For non-inductive loads other than tungsten-filament lamps, switches shall have an ampere rating not less than the ampere rating of the load.

(ii) *Tungsten filament lamp loads.* For tungsten-filament lamp loads, and for combined tungsten-filament and non-inductive loads, switches shall have a "T" rating not less than the ampere rating of the load.

(iii) *Inductive loads.* Switches controlling inductive loads shall have an ampere rating twice the ampere rating of the load unless they are of a type approved as part of an assembly or for the purpose employed.

(iv) *Motor-circuit switches.* For switches controlling motors see §§ 111.45–30 and paragraph (b) (4) of this section.

(b) *Detail requirements*—(1) *Circuit breakers.* Circuit breakers shall comply with § 111.55–15 (e).

(2) *Knife switches.* The construction of knife switches shall conform to the requirements of Underwriters' Laboratories, Inc. Standard for Knife Switches.

(3) *Snap switches.* The construction of snap switches shall conform with the requirements of Underwriters' Laboratories, Inc. Standard for Snap Switches and the switches shall be so labeled. The switches when installed in an outlet box and wired shall have a minimum spacing between live parts and ground of ¼-inch through air or over surfaces for potentials of 250 volts or less.

(4) *Enclosed switches.* Enclosed switches shall conform to the requirements of Underwriters' Laboratories, Inc. Standard for Enclosed Switches, except that sheet metal enclosures shall not be employed for use in corrosive locations unless one of the conditions covered in this subparagraph is complied with.

(i) The enclosure is fabricated of corrosion-resistant material.

(ii) The enclosure is fabricated of sheet steel not less than ⅛ inch in thickness and hot dip galvanized after fabrication.

(iii) The enclosure is fabricated of sheet steel not less than 3/16 inch in thickness and given a corrosion-resistant finish in accordance with § 110.15–40 of this subchapter.

§ 111.60–26 Shore connection boxes.

(a) Shore connection boxes shall be of ample size to accommodate the connections of the portable and fixed cables, and shall be of watertight construction when installed in damp or wet locations.

(b) Shore connection boxes for installation in corrosive locations shall not be constructed of sheet metal unless the conditions of § 111.60–25 (b) (4) (i), (ii), or (iii) are met.

(c) The minimum spacing between live parts and between live parts and ground in shore connection boxes shall meet the requirements of Table 111.35–5 (d). Means other than friction between parts shall be provided to prevent cable lugs from rotating.

(d) Shore connection boxes shall be arranged for bottom entrance of portable cable and shall provide a protected enclosure while in use.

§ 111.60–30 Receptacle outlets and attachment plugs.

(a) Receptable outlets and attachment plugs for the attachment of portable lamps, tools, and similar apparatus supplied as ship's equipment and operating at 100 volts or more, shall provide a grounding pole and a grounding conductor in the portable cord to ground the dead metal parts of the portable apparatus. For portable devices made entirely of non-conducting material or so constructed that dead metal parts will not become energized under any conditions, the grounding conductor in the portable cord and the grounding pole of the attachment plug need not be furnished. Portable apparatus shall be deemed to be any apparatus served by means of a flexible extension cord, whether the apparatus is permanently mounted or not.

(b) Receptacle outlets provided for the convenience of, and located in quarters, for, passengers or crew for connecting portable appliances operating at 100 volts or more, shall provide a grounding pole.[1]

(c) Receptacle outlets of the type providing a grounding pole shall be of a distinctive design that will not permit the dead metal parts of portable apparatus to be connected to a live conductor.

(d) Receptacle outlets for use in damp or wet locations shall be so designed that, when the plug is in place, the plug will be held in positive contact and will establish and maintain a watertight integrity of the enclosure.

(e) Receptacle outlets for use in damp or wet locations shall be so designed that, when the plug is not in place, the plug opening may be closed to establish and maintain a watertight integrity of the enclosure. Where threaded caps are used for this purpose, the cap shall be mechanically fastened to the cover or enclosure by a strong link or hinged strap.

(f) Receptacle outlets for use in locations exposed to the weather shall be so designed that with the plug opening uncovered, water will not collect in the interior of the box.

(g) Receptacle outlets for use in locations where accessible to other than qualified persons shall, with the plug opening uncovered, present no live parts. Any screw, rivet, contact, or the like which is accessible and in electrical connection with any live-metal part shall be located in a hole not more than 9/32 inch in diameter and recessed not less than 3/16 inch in the clear.

(h) When it is necessary to transmit current in one direction between two receptacle outlets by means of a portable cable with a plug on each end (such as a battery charging lead between a receptacle outlet on a ship and a receptacle outlet in a lifeboat), the plug which may be energized when not inserted in the receptacle outlet, shall be of the female type. When receptacle outlets may be used as a source of power as well as to receive power (such as the receptacles on barges that may have to supply power to adjoining barges in some make-ups and receive power from the towboat or adjoining barge in other make-ups) the receptacles shall be of the male, reverse service type. Plugs of associated portable cable shall be of the female type and shall be provided at both ends of the portable lead. The female type plug specified in this paragraph shall comply with the requirements of paragraph (g) of this section.

(i) A receptacle outlet installed on a lifeboat for the purpose of connecting it to the ship's electrical system shall be of a type that will permit the plug to pull free should the lifeboat be lowered.

(j) Where receptacle outlets on a ship are connected to different potentials, or to different types of potentials, receptacle outlet types shall be selected so that a portable device cannot be plugged into a receptacle outlet of an unsuitable potential.

(k) Receptacle outlets and plugs for use in damp or wet locations shall be constructed of corrosion-resistant material(s), or of a material(s) with a corrosion-resistant finish(es), except that receptacle outlets and plugs for use in corrosive locations shall be constructed of corrosion-resistant material(s).

(l) Receptacle outlets and plugs when installed and wired shall have a minimum spacing between live parts and ground of ¼ inch through air or over surface for potentials of 250 volts or less.

(m) Interior units of receptacle outlets and plugs shall conform to the re-

[1] Applicable to vessels contracted for on or after January 1, 1964. Vessels contracted before January 1, 1964 need not provide a type with grounding pole if operating at 125 volts or less.

quirements of Underwriters' Laboratories, Inc. Standard for Attachment Plugs and Receptacles.

§ 111.60–35 Lighting fixtures.

(a) *General requirements.* (1) Construction details shall be in accordance with Underwriters' Laboratories, Inc., Standard for Marine Type Electric Lighting Fixtures Subject 595.

(2) Open arc lamps shall not be used for applications other than for searchlights and for motion picture projectors.

(3) Fixture globes shall be protected by guards except in living quarters, wheelhouse, gyro room, radio room, galley, and similar spaces where not subject to mechanical damage.

(4) Fixtures shall be of such construction, or so installed, that the conductors in outlet boxes will not be subjected to temperatures greater than that for which the conductors are approved (75° C. for rubber insulated conductors, 85° C. for varnished-cambric insulated and mineral-insulated conductors, 95° C. for asbestos - varnished-cambric insulated conductors, and 105° C. for MIL–C–2194 type SGA cable). For the purpose of this section, an ambient temperature of 25° C. will be assumed for passenger and crew quarters, public spaces, cargo spaces, and open deck areas, an ambient temperature of 40° C. will be assumed for auxiliary machinery and work spaces, and an ambient temperature of 50° C. will be assumed for the engine and boiler rooms.

(5) Fixtures shall be so constructed, or installed, or equipped with shades and/or guards that combustible material will not be subjected to temperatures in excess of 90° C.

(6) Fixtures shall not be used as connection boxes for circuits other than the branch circuit supplying the fixture except that two or more circuits may supply the fixture when:

(i) One or more lamps of a multilamp fixture are supplied from an emergency lighting circuit; or

(ii) When the number of lamps of a fixture exceeds the capacity of a single circuit. When more than one circuit is employed in a fixture, the circuits shall be as widely separated as possible and the different circuits clearly identified at terminal points. Also see § 111.50–20 (c) (5).

(7) For wiring of explosion-proof equipment see § 111.60–40.

(b) *Lighting fixture installations.* (1) Fixtures installed in locations exposed to the weather and in other locations occasionally exposed to splashing water shall be of watertight construction. Fixtures installed in other wet or damp locations shall be of at least dripproof construction as installed.

(2) Any combustible bulkhead or ceiling finish exposed between the edge of a fixture canopy or pan and the outlet box shall be covered with noncombustible material.

(3) In a completed installation, each outlet box shall be provided with a cover unless it is covered by means of a fixture canopy, lampholder, or similar device.

(4) Fixtures, lampholders, and receptacle outlets shall be securely supported. Fixtures shall not be supported by the screw shell of a lampholder.

(5) Pendent fixtures shall be suspended by, and supplied through threaded rigid conduit stems.

(6) Table lamps, desk lamps, floor lamps, and similar equipment shall be secured in place to prevent displacement by the roll or pitch of the vessel.

(c) Grounding of lighting equipment. (1) Lighting equipment (including fixtures) shall be grounded.

(2) Equipment shall be considered as grounded when mechanically connected in a permanent and effective manner to the metal structure of the ship, the armor of armored cable, or a grounding connector.

§ 111.60–40 Wiring methods and materials for hazardous locations.

(a) *General.* (1) The provisions of this section apply to locations in which equipment and wiring are subjected to the conditions indicated by the classifications covered by subparagraphs (7) through (9) of this paragraph. It is necessary that each compartment or area containing electrical equipment be considered individually in order to determine its hazard classification. Except as modified by this section, all other applicable rules contained in this subchapter shall apply to electrical equipment and wiring installed in hazardous locations.

(2) The term "explosion-proof" as used in this section shall mean enclosed in a case which is capable of withstanding an explosion of a specified gas or vapor which may occur within it, and of preventing the ignition of the specified gas or vapor surrounding the enclosure by sparks, flashes or explosions of the gas or vapor within.

(3) Through the exercise of ingenuity in the layout of electrical installations for hazardous locations, it is frequently possible to locate much of the equipment in less hazardous or nonhazardous areas and thus reduce the amount of special equipment required. The amount of electrical equipment or wiring in hazardous locations shall be minimized.

(4) The intent of this section is to require a form of construction of equipment, and of installation that will insure safe performance under conditions of proper use and maintenance. It is necessary, therefore, that more than ordinary care be exercised with regard to the installation and maintenance of equipment and wiring in hazardous areas.

(5) Explosion-proof switches and switches controlling explosion-proof equipment shall have a pole for each circuit conductor.

(6) The explosive characteristics of various atmospheric mixtures of hazardous gases, vapors and dusts depend on the specific hazardous material involved. It is necessary, therefore, that equipment be designed not only for the class of location but also for the specific gas, vapor or dust that will be present. For the purpose of approval, the following atmospheric mixtures have been grouped on the basis of their explosive characteristics:

Group A: Atmospheres containing acetylene;
Group B: Atmospheres containing hydrogen, or gases or vapors of equivalent hazard, such as manufactured gas;
Group C: Atmospheres containing ethyl ether vapor;
Group D: Atmospheres containing gasoline, petroleum, naphtha, alcohols, acetone, lacquer solvent vapors, and natural gas;
Group E: Atmospheres containing metal dust;
Group F: Atmospheres containing carbon black, coal or coke dust; and
Group G: Atmospheres containing grain dust.

(7) Class I locations are those in which flammable gases or vapors are or may be present in the air in quantities sufficient to produce explosive or ignitible mixtures.

(i) This classification would usually include locations such as cargo pump rooms, cofferdam areas, and in some cases open deck areas, storage and mixing rooms for paint and allied products, storage rooms for oil, oil lamps and the like, battery rooms, and hospital operating rooms in which combustible anesthetics may be administered.

(ii) Special limitations and requirements for electrical installations in hazardous locations on tank vessels are contained in Subpart 111.70.

(8) Class II locations are those in which combustible dust is or may be in the air continuously, intermittently, or periodically under normal conditions, in quantities sufficient to produce explosive or ignitible mixtures.

(i) This classification would usually include the working areas handling bulk grain and similar products, coal pulverizing plants (except where the pulverizing equipment is essentially dust-tight), and the like.

(9) Class III locations are those in which easily ignitible fibers or materials producing combustible flyings are handled or used.

(i) Easily ignitable fibers and combustible flyings will include rayon, cotton (including cotton linters and cotton waste), sisal or henequen, istle, jute, hemp, tow, cocoa fiber, oakum, baled waste, kapok, Spanish moss, excelsior, sawdust, and other materials of similar nature.

(ii) Class III locations will usually include areas where the above products are handled in bulk, and in carpenter shop and similar locations.

(b) *Electrical installations in Class I, Groups A, B, C, and D, hazardous locations*—(1) *Meters, instruments and relays.* Meters, instruments, and relays, including kilowatt-hour meters, instrument transformers and resistors, rectifiers and thermionic tubes, shall be provided with explosion-proof enclosures approved for Class I locations.

(2) *Switches, circuit breakers, motor controllers and fuses.* Switches, circuit breakers, motor controllers and fuses, including pushbuttons, relays and similar devices, shall be provided with enclosures, and the enclosures in each case

together with the enclosed equipment shall be approved as a complete assembly for use in Class I locations.

(3) *Control transformers and resistors.* Transformers, impedance coils and resistors used as, or in conjunction with, control equipment for motors, generators and appliances, together with any switching mechanism associated with them, shall be provided with explosion-proof enclosures approved for Class I locations.

(4) *Motors and generators.* Motors, generators and other rotating electrical machinery shall be of enclosed explosion-proof type approved for Class I locations.

(5) *Lighting fixtures.* Each lighting fixture shall be approved as a complete assembly for class I locations, and shall be clearly marked to indicate the maximum wattage of lamps for which it is approved. Fixtures intended for portable use shall be specifically approved as a complete assembly for that use.

(i) *Mechanical injury.* Each fixture shall be protected against mechanical injury by a suitable guard. Pendent fixtures having rigid conduit stems longer than 12 inches shall have permanent and effective bracing against lateral displacement.

(ii) *Support.* Boxes, box assemblies or fittings used for the support of lighting fixtures shall be approved for the purpose and for Class I location.

(6) *Appliances, fixed and portable.* Appliances, including electrically heated and motor-driven appliances, shall be approved for Class I locations.

(7) *Flexible cords.* A flexible cord may be used only for connections between a portable lamp or a portable appliance and the fixed portion of its supply circuit and where used shall be of a type approved for extra hard usage; shall contain, in addition to the conductors of the circuit, a grounding conductor; shall be connected to terminals or to supply conductors in an approved manner; shall be supported by clamps or by other suitable means in such a manner that there will be no tension on the terminal connections; and shall be provided with suitable seals where the flexible cord enters boxes, fittings, or enclosures of explosion-proof type.

(i) Where flexible cords may be exposed to liquids having a deleterious effect on rubber, they shall be of a type approved for use under such conditions.

(8) *Receptacle outlets and attachment plugs.* Receptacle outlets and attachment plugs shall be of the polarized type providing for connection to the grounding conductor of the flexible cord and shall be approved for Class I locations.

(9) *Signal, alarm, remote-control and communication systems.* Signal, alarm, remote-control and communication systems, irrespective of voltage, shall be approved for Class I locations.

(10) *Wiring methods.* (i) Electric cables shall be leaded and armored, or impervious sheathed and armored, or mineral-insulated metal sheathed.

(ii) The cable entrance to each explosion-proof device shall be sealed to prevent the passage of gases, vapors, or flames from within the explosion-proof enclosure.

(iii) The seal fitting shall be located as close as practicable to, but in no case more than 18 inches from, the enclosure, and shall be connected thereto by means of a short length of rigid metal conduit with threaded explosion-proof joints each having at least 5 full threads engaged. Type MI cables, however, shall enter enclosures directly through explosion-proof fittings especially approved for Class I locations.

(iv) Except for type MI cables, all cable covering except the individual conductor insulation shall be removed in way of the seal fitting, and the seal fitting filled with a sealing compound.

(v) The sealing compound shall be approved for the purpose, shall not be affected by the surrounding atmosphere or liquids, and shall not have a melting point of less than 93 degrees C.

(vi) In the completed seal, the minimum thickness of the sealing compound shall be not less than the trade size of the conduit, and in no case less than $\frac{5}{8}$ of an inch.

(vii) Splices and taps shall not be located in the seal-fitting, nor shall other fittings in which splices or taps are made be filled with compound.

(c) *Electrical installations in Class II hazardous locations*—(1) *Switches, circuit breakers, motor controllers, and fuses.* Switches, circuit breakers, motor controllers and fuses, including push-buttons, relays and similar devices, which are intended to interrupt current in the normal performance of the function for which they are installed, or which are installed where dusts of an electrically conducting nature may be present, shall be provided with dust-tight enclosures approved for Class II locations.

(i) Disconnecting and isolating switches containing no fuses and not intended to interrupt current, and which are not installed where dust may be of an electrically conducting nature, shall be provided with tight metal enclosures which shall be equipped with close fitting covers, or with other effective means to prevent the escape of sparks or burning material; and shall have no openings (such as holes for attachment screws) through which, after installation, sparks or burning material might escape, or through which exterior accumulations of dust or adjacent combustible material might be ignited.

(2) *Control transformers and resistors.* Transformers, impedance coils and resistors used as, or in conjunction with, control equipment for motors, generators and appliances, and any overcurrent devices or switching mechanisms associated with them, shall have dust-tight enclosures approved for Class II locations.

(3) *Motors and generators.* Motors, generators and other rotating electrical machinery shall be totally enclosed not ventilated, totally enclosed pipe ventilated, or totally enclosed fan-cooled, and shall be approved for Class II locations.

(4) *Appliances, fixed and portable.* Appliances, fixed and portable, including electrically heated and motor-driven appliances, shall be approved for Class II locations.

(5) *Lighting fixtures.* Each lighting fixture, fixed or portable, shall be approved for Class II locations, and shall be clearly marked to indicate the maximum wattage of the lamp for which it is approved. Each fixture shall be protected against mechanical injury by a suitable guard. Pendent fixtures having rigid conduit stems longer than 12 inches shall have permanent and effective bracing against lateral displacement. Boxes, box assemblies or fittings used for the support of lighting fixtures shall be approved for the purpose and for Class II locations.

(6) *Receptacles and attachment plugs.* Receptacles and attachment plugs shall be polarized type providing for connection to the grounding conductor of the flexible cord, and shall be approved for Class II locations.

(7) *Signal, alarm, remote-control, and communication systems.* (i) Switches, circuit breakers, relays, contactors and fuses which may interrupt other than voice currents, and current-breaking contacts for bells, horns, howlers, sirens and other devices in which sparks or arcs may be produced, shall be provided with dust-tight enclosures approved for Class II locations.

(ii) Resistors, transformers, and choke coils which may carry other than voice currents, and rectifiers, thermionic tubes, and other heat generating equipment or apparatus shall be provided with dust-tight enclosures approved for Class II locations.

(8) *Wiring methods*—(i) *Fittings and boxes.* Fittings and boxes shall be provided with threaded bosses for terminal tubes, shall have close fitting covers, and shall have no openings (such as holes for attaching screws) through which sparks or burning material might escape. Fittings or boxes in which taps, joints or terminal connections are made, or which are used in locations where dusts are of an electrically conducting nature, shall be approved for Class II locations.

(ii) *Electric cables.* Electric cables shall be leaded and armored, impervious sheathed and armored, or mineral-insulated metal sheathed. Cable entrances shall be made dust-tight by terminal tubes or, in case of Type MI cable, by fittings designed for that purpose.

(iii) *Flexible connections.* Where necessary to employ flexible connections, dust-tight flexible connectors, flexible metal conduit, or flexible cord approved for extra hard usage and provided with bushed fittings shall be used, except that where dusts are of an electrically-conducting nature, flexible metal conduit shall not be used, and flexible cords shall be provided with dust seals at both ends. Where flexible cords are subject to oil or other corrosive conditions, the conductors shall be of a type approved for the condition. An additional conductor for grounding shall be provided in the flexible cord.

(d) *Electrical installations in Class III hazardous locations*—(1) *Switches circuit breakers, motor controllers and fuses.* Switches, circuit breakers, motor

controllers, and fuses, including push buttons, relays, and similar devices, shall be provided with tight metal enclosures which shall be equipped with close fitting covers, or with other effective means to prevent escape of sparks or burning material; and shall have no openings (such as holes for attachment screws) through which after installation, sparks or burning material might escape, or through which exterior accumulations of fibers or flyings or adjacent combustible material might be ignited.

(2) *Control transformers and resistors.* Transformers, impedance coils and resistors used as, or in conjunction with, control equipment for motors, generators and appliances, shall conform to paragraph (c) (2) of this section.

(3) *Motors and generators.* Motors, generators, and other rotating electrical machinery shall be totally enclosed not ventilated, totally enclosed pipe-ventilated, or totally-enclosed fan-cooled.

(4) *Applicances, fixed and portable.* Appliances, fixed and portable, shall conform to the requirements of this subparagraph.

(i) *Heaters.* Electrically heated appliances shall be provided with dust-tight enclosures and shall be approved for Class III locations.

(ii) *Motors.* Motors of motor-driven appliances shall conform to subparagraph (3) of this paragraph. Appliances which may be readily moved from one location to another shall conform to requirements for the most hazardous location.

(iii) *Switches, circuit breakers, motor controllers and fuses.* Switches, circuit breakers, motor controllers and fuses shall conform to paragraph (c) (1) of this section.

(5) *Lighting fixtures.* Lighting fixtures shall conform to the requirements of this subparagraph.

(i) *Construction.* Each fixture shall be of dust-tight type so designed that in the event of burnout of lamp or lampholder, no spark or hot metal can escape from the fixture. Unless each fixture is so constructed that it will not accept a lamp of larger wattage than that for which it is designed, it shall be clearly marked to indicate the maximum wattage of lamp that should be used.

(ii) *Mechanical injury.* A fixture which may be exposed to mechanical injury shall be protected by a suitable guard.

(iii) *Supports.* Boxes, box assemblies or fittings used for the support of lighting fixtures shall be of a type approved for the purpose.

(iv) *Portable lamps.* Portable lamps shall be dust-tight and shall be protected with substantial guards. Lampholders shall be of unswitched type with no exposed metal parts. Unless the portable lamp is so constructed that it will not accept a lamp of larger wattage than that for which it is designed, it shall be clearly marked to indicate the maximum wattage of lamp that should be used.

(6) *Receptacles and attachment plugs.* Receptacles and attachment plugs shall conform to paragraph (c) (6) of this section.

(7) *Signals, alarm, remote control and communication systems.* Signal, alarm, remote-control and communication systems shall conform to paragraph (c) (7) of this section.

(8) *Wiring methods.* (i) Fittings and boxes in which taps, joints, or terminal connections are made shall be provided with close fitting covers, or other effective means, to prevent the escape of sparks or burning material; and shall have no openings (such as holes for attaching screws) through which, after installation, sparks or burning material might escape, or through which exterior accumulations of fibers or flyings or adjacent combustible materials might be ignited.

(ii) Electric cables shall conform to paragraph (c) (8) (ii) of this section.

(iii) Flexible connections shall conform to paragraph (c) (8) (iii) of this section.

Subpart 111.65—Special Requirements for Certain Locations and Systems

§ 111.65–1 Application.

The requirements of this subpart contain special requirements relative to electrical installations in specific areas and to specific electrical systems. Except as modified by this subpart, all other applicable rules contained in this subchapter shall also apply to such installations and systems.

§ 111.65–5 Special requirements for hospital operating rooms.

(a) *Application.* The requirements of this section are applicable to any area of a hospital in which it is intended to administer to a patient any combustible anesthetic agent in the course of examination or treatment, and to any room used for storage of combustible anesthetic or disinfecting agents.

(b) *General requirements.* The electrical installations and electrical equipment in anesthetizing locations and in storage locations for combustible anesthetic or disinfecting agents shall comply with "Code for Use of Flammable Anesthetics (Safe Practice for Hospital Operating Rooms)" published by National Fire Protection Association. The requirements of "Class I, Group C, Division 1 locations of Article 500 of the National Electrical Code" as referred to in "Code for Use of Flammable Anesthetics (Safe Practice for Hospital Operating Rooms)" shall be be construed to mean the requirements for Class I, Group C locations covered in § 111.60–40(b).

§ 111.65–10 Special requirements for locations where gasoline or other highly volatile motor fuel is carried in vehicles.

(a) *Application.* The provisions of this section are applicable to any area in which gasoline or other highly volatile motor fuel is stored in self-propelled vehicles being transported.

(b) *General requirements.* Electrical equipment which tends to produce arcs or sparks, such as cutouts, switches, receptacles, lampholders, generators, motors, or other equipment having make-or-break or sliding contacts, when installed within 18 inches of the deck, shall be of a type approved for Class I, Group D locations, in accordance with § 111.60–40(b). Electrical equipment installed at or over 18 inches above the deck shall be of the totally-enclosed type or drip-proof protected equipment provided with suitable guards or screens to prevent escape of sparks or hot metal particles.

(1) The reference to a level of 18 inches above the deck shall be construed to mean each deck at or above the weather deck on which vehicles are transported.

(2) Areas below the weather deck on which vehicles are transported shall be deemed to be a hazardous area to a height 18 inches above the weather deck. Where continuous pressure-positive ventilation of areas below the weather deck on which vehicles are transported is provided, the hazardous area may be deemed to extend only up to a height of 18 inches above the deck in each such area: *Provided,* That all the following conditions are complied with:

(i) The quantity of ventilating air shall be not less than 1 cubic foot per minute per square foot of deck area.

(ii) The ventilation system shall be such as to prevent air stratification as well as to prevent the accumulation of air pockets.

(iii) An alarm system shall be provided to indicate in the wheelhouse the loss of the required ventilation.

§ 111.65–15 Special requirements for motion picture projection rooms and projection equipment.

(a) *General*—(1) *Professional type projectors.* The professional type of projectors shall be located in a projector room. Such rooms shall not be considered as a hazardous location as defined in § 111.60–40. (The professional projector employs a 35-millimeter film which is 1⅜ inches wide and has on each edge 5.4 perforations per inch.)

(2) *Non-professional type projectors.* Projectors of the non-professional or miniature type, if employing only approved slow-burning (cellulose acetate or equivalent) film, may be operated without a projection room.

(b) *Equipment and projectors of the professional type*—(1) *Motor-driven projectors.* Motor-driven projectors shall be approved for the purpose as an assembly or shall comply with all the conditions contained in this subparagraph.

(i) An approved projector shall be used.

(ii) An approved projector lamp shall be used.

(iii) Motors shall be so designed or guarded as to prevent ignition of film by sparks or arcs.

(iv) Projectors shall be under the charge of a qualified person.

(2) *Conductor size.* Conductors supplying outlets for projectors of the professional type shall not be smaller than No. 8 AWG, and shall be of sufficient size for the projector employed.

(3) *Conductor insulation.* Conductors having a maximum operating temperature of 200 degrees C. shall be used on all lamps or other equipment when the ambient temperature at the conductors as installed will exceed 50 degrees C.

(4) *Flexible cords.* Cords approved for hard service shall be used on portable equipment.

(5) *Lamp guards.* Incandescent lamps in projector rooms shall be provided with guards unless otherwise protected by noncombustible shades or other enclosures.

(6) *Location of equipment.* Motor-generator sets, transformers, rectifiers, rheostats, and similar equipment for the supply or control of current to arc lamps on projectors shall, if practicable, be located in separate rooms. If placed in the projector room, they shall be so located or guarded that arcs or sparks cannot come in contact with film. Motor-generator sets shall have the commutator end or ends totally enclosed.

(7) *Equipment prohibited.* No switches, overcurrent devices, or other equipment, not normally required or used for projectors, sound reproduction, flood, or other special effect lamps or other equipment, shall be installed in projector rooms, except remote-control switches for control of auditorium lights.

(c) *Construction of equipment and projectors of the professional type.* (1) Projectors and enclosures for arc or incandescent lamps and associated equipment shall be of a type, listed as approved by Underwriters' Laboratories, Inc.

§ 111.65–20 Special requirements for electric elevators and dumbwaiters.

(a) *Application.* The requirements of this section are applicable to electric elevators and dumbwaiters.

(b) *General requirements.* The electrical control and interlock circuits of elevators and dumbwaiters shall be in accordance with American Standards Association Safety Code for Elevators, Dumbwaiters, and Escalators. The construction of control switches shall conform with the requirements of Underwriters' Laboratories, Inc. Standard for Elevator Electric Contacts and Elevator Hoistway Door Interlocks.

§ 111.65–25 Special requirements for submersible motor-driven bilge pumps.

(a) *Application.* The requirements of this section are applicable to submersible motor-driven bilge pumps required on certain vessels by Subpart 55.10 of Subchapter F (Marine Engineering) of this chapter.

(b) *General requirements.* (1) The electric motor driving the submersible bilge pump shall be installed in an open end air bell of rugged construction and of such proportions that flooding of the compartment, in which it is located to the bulkhead deck will not cause water to enter the motor.

(2) The motor may be of the open type provided it is protected against splashing water from the bottom.

(3) Cables to the motor shall enter through the open bottom of the air bell.

(4) The motor shall be capable of continuous operation at rated load under any condition, dry or with water in air bell at any level up to maximum.

(5) The motor controller shall be located above the bulkhead deck with a master switch at the controller and a master switch at the motor. The master switch at the motor shall be connected in such a manner that it will be completely disconnected from the circuit when the motor is started or stopped from the remote master switch.

(6) The motor shall be energized from the final source of emergency lighting and power.

§ 111.65–30 Special requirements for electric power-operated watertight door system.

(a) *Application.* The provisions of this section are applicable to electric power-operated watertight door systems required by Subpart 73.35 of Subchapter H (Passenger Vessels) of this chapter, except that only paragraph (g) of this section shall be applicable to installations contracted for prior to November 19, 1952.

(b) *General requirements.* The watertight door operating system shall comply with the specification requirements of Subpart 163.001 of Subchapter Q (Specifications) of this chapter.

(c) *Power supply.* The power supply to power operated watertight door systems shall comply with the requirements contained in this paragraph.

(1) The source of power for electric motor-driven door operators shall be the source of the emergency lighting and power system as required by Subpart 112.15 of this chapter.

(2) If the peak current resulting from the simultaneous starting of all doors is too great for the temporary or final source of supply, the control shall be so arranged that when the central master switch is put to "close" the doors will start to close serially at intervals of not more than 3 seconds, preference being given to the doors starting with those in the lowest part of the vessel. The total time for all doors to be closed shall not exceed 60 seconds.

(3) The power supply for hydraulically operated watertight door systems employing a hydraulic system common to more than one watertight door shall be an accumulator tank of sufficient capacity to open all doors twice and to close all doors three times and one or more motor-driven hydraulic pumps capable of being operated from the final source of the emergency lighting and power system.

(i) The motor-driven hydraulic pumps automatically shall maintain the accumulator tank pressure within the design limits, and shall be located and controlled from above the bulkhead deck.

(ii) The accumulator tank capacity required by subdivision (i) of this subparagraph shall be available when the accumulator tank pressure is at the automatic pump "cut-in" pressure.

(4) The source of power for hydraulically operated watertight door systems employing an independent hydraulic system for each door operator shall be as required by subparagraphs (1) and (2) of this paragraph.

(5) The power supply for other types of watertight door operators shall be as approved by the Commandant.

(d) *Distribution.* Distribution of electric power to the watertight door operators shall comply with the requirements covered in this paragraph.

(1) Distribution panelboards used in connection with watertight door systems shall be located above the bulkhead deck and shall be provided with means for locking to prevent unauthorized access to the switching devices or fuses.

(2) Feeders supplying several watertight door operators shall be located above the bulkhead deck.

(3) A separate branch circuit shall be provided for each watertight door operator.

(e) *Overcurrent protection.* Overcurrent devices employed in watertight door system feeders and branch circuits shall be arranged to isolate a fault with as little disruption of the system as possible. The relationship between loads and rating or setting of overcurrent devices shall conform to the requirements covered in this paragraph.

(1) The rating or setting of each feeder overcurrent device shall be not less than 200 percent of its maximum load.

(2) The rating or setting of a branch circuit overcurrent device shall be not more than 25 percent of that of the feeder overcurrent device.

(f) *Cable.* All cable used in connection with watertight door system feeder circuits or branch circuits shall be leaded and armored, impervious sheathed and armored, or mineral-insulated, metal sheathed.

(g) *Existing vessels.* (1) Existing arrangements, materials, and facilities previously approved but not meeting the applicable specifications or requirements set forth in paragraphs (b) through (f) of this section may be continued in service so long as they are maintained in good condition to the satisfaction of the Officer in Charge, Marine Inspection. Minor repairs and minor alterations may be made to the same standards as the original installation provided that in no case will a greater departure from the standards of paragraphs (b) through (f) of this section be permitted than presently exist.

(2) All new installations or major replacements shall meet the applicable specifications or requirements for new vessels.

§ 111.65–35 Special requirements for fire screen door holding and release systems.

(a) *Application.* When an electric fire screen door holding and release system is installed in compliance with the requirements of Part 72 of Subchapter H (Passenger Vessels) of this chapter, the provisions of this section, with the exception of paragraph (e) of this section shall apply to all installations contracted for on or after November 19, 1952. Installations contracted for prior to November 19, 1952, shall meet the requirements of paragraph (e) of this section.

(b) *Definitions.* (1) The term "fire screen door" will be used in this section to designate any self-closing door required to comply with § 72.05–25 (b) of Subchapter H (Passenger Vessels) of this chapter.

(2) The term "fire screen holding device" will be used in this section to designate any device designed and installed for the purpose of holding open a fire screen door.

(3) The term "local control station" will be used in this section to designate any manually operated device installed adjacent to a fire screen door for the purpose of releasing the door so that the fire screen door self-closing mechanism may close the door.

(4) The term "central control station" will be used in this subpart to designate any manually operated device installed to release the fire screen doors from the wheelhouse or fire control room.

(c) *General.* (1) The fire screen door holding and release system requirements contained in this section presuppose that the fire screen doors will be held open by electromagnets, door release being effected by deenergizing the electromagnets.

(2) The Commandant may accept any other means for fire screen door holding and releasing not less effective than the electromagnetic type covered by this subpart.

(d) *General requirements.* (1) The fire screen door holding and release system shall consist of an electromagnet for each fire screen door, a self-aligning armature plate on each door to be seized and held by the electromagnet when the fire screen door is fully open, a control switch located adjacent to the door to interrupt the supply potential to the electromagnet, and a central control located in the wheelhouse or fire control room to interrupt remotely potential to all holding magnets.

(2) The fire screen door holding circuit shall be arranged so that loss of potential from any cause will release the doors, except that momentary interruptions of the circuit that may result from the operation of automatic bus-transfer devices in connection with the emergency lighting and power system, will not release the doors.

(3) The central control station shall consist of an enclosed switch, circuit breaker, or magnetic contactor of ample rating to interrupt the connected load. The switching unit shall be externally operative and maintaining in both the "hold doors" and "release doors" positions.

(4) The local control station shall consist of an enclosed externally operative fused switch having a rating of not less than 10–T amperes, 125 volts, and may be either the momentary contact type or the maintaining contact type. A single door holding magnet shall be connected to the fuse end of this local control station. Where several doors are in close proximity to each other, a single local control station switch of ample rating may be used to release simultaneously these several doors.

(5) A door holding electromagnet shall be designed for a nominal pull of approximately 200 pounds. When the arrangement of the electrical supply involves transfer relays to transfer the supply from a normal to a temporary source, a door holding electromagnet shall be designed so that, with a pull on the armature of 110 pounds, the armature will be held in the sealed position for approximately ¼ second after the circuit to the electromagnet is opened. The electromagnet shall be designed for continuous duty in an ambient temperature of 50 degrees C. with a temperature rise by thermometer measurement of not more than 55 degrees C. for Class A insulation nor more than 75 degrees C. for Class B insulation. The electromagnet coil shall be vacuum impregnated and the magnet enclosure shall be either drip-proof or watertight.

(6) The source of power for the fire screen door holding and release system shall be the emergency lighting and power system as required by Subpart 112.15 of this subchapter.

(7) On large vessels where the closing of all fire screen doors simultaneously would seriously interfere with fire-fighting operations or with the evacuation of passengers, it is recommended that the fire screen door release system be subdivided into several circuits. The circuits shall be arranged so that it will be possible to isolate any compartment in which a fire is reported by a sufficient number of closed fire screen doors effectively to stop all draft to the fire area. An effective draft stop will entail closing:

(i) All fire screen doors in the area between the main vertical zone bulkheads immediately forward and aft of the fire area;

(ii) All fire screen doors in the main vertical zone bulkheads immediately forward and aft of the fire area; and,

(iii) All fire screen doors in the next adjacent main vertical zones, forward and aft of the fire area. The fire screen door tripping arrangement shall be specifically approved for each vessel.

(e) *Existing vessels.* Fire screen door holding and release systems on vessels contracted for prior to November 19, 1952, shall meet the requirements covered in this paragraph.

(1) Existing arrangements, materials, and facilities previously approved will be considered satisfactory so long as they are maintained in good condition to the satisfaction of the Officer in Charge, Marine Inspection. Minor repairs and minor alterations may be made to the same standard as the original installation.

(2) All new installations or major replacements shall meet the applicable specifications or requirements for new vessels.

§ 111.65–40 Special requirements of electric power-operated lifeboat winches.

(a) *Application.* The provisions of this section, with the exception of paragraph (i) of this section, shall apply to all vessels contracted for on or after November 19, 1952. The provisions of paragraph (i) of this section, shall apply to all vessels contracted for prior to November 19, 1952.

(b) *General.* The provisions of this section supplement the requirements of Subpart 160.015 of Subchapter Q (Specifications), Part 33 of Subchapter D (Tank Vessels), Part 75 of Subchapter H (Passenger Vessels) and Part 94 of Subchapter I (Cargo and Miscellaneous Vessels) of this chapter.

(c) *General construction requirements.* (1) Control and power circuit switches and motor controllers installed in conjunction with lifeboat winches shall be of types specifically approved for use with lifeboat winches.

(2) Switches and motor controllers shall be of a design not likely to be adversely affected by corrosion of the working parts. Particular attention shall be given to hinged parts of contactors and relays. Structural parts, such as the enclosing cases, if not constructed of corrosion-resistant materials, shall be given a durable corrosion-resistant finish.

(3) Insulating materials shall be limited to those which exhibit the lowest relative water absorption and/or the least effect of such water absorption upon the dielectric properties consistent with the other necessary characteristics.

(4) Where gaskets are used to provide a water seal between parts of an assembly, the gasket shall be secured in place in such a manner as to prevent its falling out or becoming loose when the unit is disassembled.

(5) Holes in the walls of equipment housings for the purpose of providing means for the attachment of parts on the interior thereof, or for securing covers and the like, shall not penetrate the total thickness of the housing wall.

(6) Totally enclosed units shall be provided with a needle valve or with at least one hole closed by a ¼ inch pipe plug for draining condensed moisture. The valve or hole shall be located at the bottom, or as near the bottom as practicable, of the enclosure in order that it may drain the enclosure satisfactorily.

(7) Main line emergency disconnect switches, when installed in a location accessible to passengers, shall be provided with means whereby the switch can be locked in the open-circuit position by means of a padlock or the equivalent. The switch shall have no provisions for locking in the closed-circuit position.

(d) *Detail construction requirements*—(1) *Enclosures.* Each enclosure for motor controller and switching de-

vices, when installed in locations exposed to the weather, shall be capable of meeting the test requirements of paragraph (e) of this section.

(2) *Electrical clearances.* The minimum creepage and air clearance distance between live parts of different polarity of motor controllers, master switches, and control circuit limit switches shall be not less than the values shown in Table 111.65–40 (d) (2). It is desirable to exceed these values where possible. The electrical clearances for power circuit limit switches and main line emergency disconnect switches shall be not less than the general requirements for such devices given in this part.

(3) *Motors.* Motors shall be of watertight construction in accordance with the general requirements of this part.

TABLE 111.65–40 (d) (2)—MINIMUM SPACINGS IN INCHES

Potential involved in volts	0–150	151–300	301–600
Between any uninsulated live part and an uninsulated live part of opposite polarity, an uninsulated grounded part other than the enclosure, or an exposed metal part.	Through air ¼ Over surface ½	5/16 ⅝	⅜ ¾
Between any uninsulated live part and the walls of a metal enclosure, including fittings for cable entrance.	Through air ⅛ Over surface ¾	⅛ ¾	⅛ ¾

(e) *Spraytight test.* (1) Before conducting this test, all joints that have gaskets or sealing compounds, or that have been painted, shall be broken and reassembled three times; this procedure also applies to doors and to cover plates. There shall be no leakage of water into the enclosure after it has been subjected to one of the following methods of submergence for a period of five continuous minutes:

(i) The enclosure shall be submerged in water to such a depth that the highest point of the enclosure in its normally mounted position is under a three-foot head; or

(ii) The enclosure shall be submerged in water at least 3 inches at the highest point in an open tank. Sufficient vacuum shall then be applied to the inside of the enclosure to produce an external pressure equivalent to a 3-foot head of water.

(2) The following additional test shall be conducted immediately after either of the above tests, and while the enclosure is still submerged. An internal air pressure shall be applied for a period of 5 minutes equal to 1½ pounds per square inch, plus a pressure equivalent to the depth of submergence.

(3) Under these tests the enclosure will be considered spraytight if no water is found inside the enclosure, and if no air bubbles are seen to emerge. Where a shaft enters the enclosure, the shaft shall be operated twice while submerged.

(4) The following formula may be used to determine the necessary vacuum:

$$M = 0.074\ (12H - W) \qquad (1)$$

where:

M = vacuum in inches of mercury,
H = equivalent head of water in feet, and
W = depth of water in inches covering the highest point of the enclosure.

(f) *Wiring of lifeboat winch components.* (1) When the motor controller of a lifeboat winch power unit is located adjacent to the winch, the main line emergency switch shall disconnect all parts of the lifeboat winch power unit, including the motor controller and limit switches, from all sources of potential. Any other power circuit switches employed shall be connected in series with the main line emergency switch and ahead of the motor controller. The main line emergency switch shall serve as the motor and controller disconnect required by the general requirements of this part, and shall have a horsepower rating not less than that of the winch motor.

(2) When the motor controller of a lifeboat winch power unit is remotely located with relation to the winch, a switch shall be provided at the controller arranged to disconnect the entire winch electrical installation from all sources of potential. In such cases, the main line emergency switch shall be connected in series with this circuit disconnect switch and ahead of the power circuit limit switches, when employed, and ahead of the motor controller.

(3) Davit arm limit switches, whether connected in the power circuit or in the control circuit, shall disconnect all ungrounded conductors of the circuit controlled.

(4) Where one motor is used with two winches, a main line emergency switch, a clutch interlock switch, and a master switch shall be provided for each winch, except that a single main line emergency switch located in accordance with subparagraph (5) of this paragraph with respect to both winches will be accepted. The main line emergency switches shall be connected in series ahead of the motor controller. The master switches shall be connected in parallel and each in series with the corresponding clutch interlock switch for that winch. The clutch interlock switches shall open the circuit to its master switch except when the power unit is clutched to the associated winch. Means shall be provided to prevent the power unit from being clutched to both winches simultaneously.

(5) Typical lifeboat winch wiring diagrams and arrangement drawings are shown on Figures 111.65–40 (f) (5) (i) through 111.65–40 (f) (5) (iv), the arrangement of the equipment shown being diagrammatical. The fact that some show direct current motors and some show alternating current motors has no particular significance. In actual installations the main line emergency disconnect switch shall be so located as to be adjacent to the master switch; within reach of the winch operator; in a position accessible to the person in charge of the boat stowage; and in a position, for gravity davit installations, from which the movement of both davit arms can be observed as they approach the final stowed position. Special consideration will be given to other arrangements where complete compliance with these location requirements cannot be met.

(g) *Procedure for approval of lifeboat winch electrical installations and equipment*—(1) *Switches.* Manufacturers of master switches, limit switches, and main line emergency disconnect switches desiring to qualify their products for use in connection with lifeboat winch installations shall submit for review detail assembly drawings of the unit, identifying each part used in the assembly and the material specification, including finish, if any, of each part. After the detail assembly drawings have been reviewed sample units may be requested for testing. Units found to comply with the requirements of this section will be listed by the Coast Guard as being satisfactory for use as lifeboat winch auxiliary equipment.

(2) *Motor controllers.* Manufacturers of motor controllers desiring to qualify their products for use in conjunction with lifeboat winch installations shall submit for review detail assembly drawings and material lists of the enclosing cases to be furnished, and detail assembly drawings and material lists and/or samples of contactors, relays, resistors and other motor controller components to be employed. For each installation of lifeboat winch motor controllers there shall be submitted for approval a drawing showing the enclosure outline, front view assembly, wiring diagram, and material list, together with the name or other identification of the vessel on which the motor controllers will be installed. No general approval of motor controllers will be given.

(3) *Motors.* For each installation of lifeboat winch motors, plans as required by § 111.05–5 shall be submitted, together with the name or other identification of the vessel on which the motor will be installed. No general approval of motors will be given.

(4) *Shipboard installation drawing.* For each shipboard installation of electric power-operated lifeboat winches, an elementary wiring diagram and isometric or deck wiring diagram as required by § 111.05–5 shall be submitted.

(h) *Testing of lifeboat winch electrical equipment.* The electrical equipment shall be given periodic inspections and tests as required by Part 78 of Subchapter H (Passenger Vessels) and Part 97 of Subchapter I (Cargo and Miscellaneous Vessels) of this chapter.

(i) *Electric power-operated lifeboat winches for existing vessels.* (1) The electrical equipment installed in connection with electric power-operated lifeboat winches used with gravity davits on passenger vessels and cargo vessels contracted for prior to November 19, 1952, and on tank vessels contracted for on or after November 19, 1952 shall comply with the requirements of § 160.015–3(k) of Subchapter Q (Specifications) of this chapter and with the wiring arrangements of § 111.65–40(f).

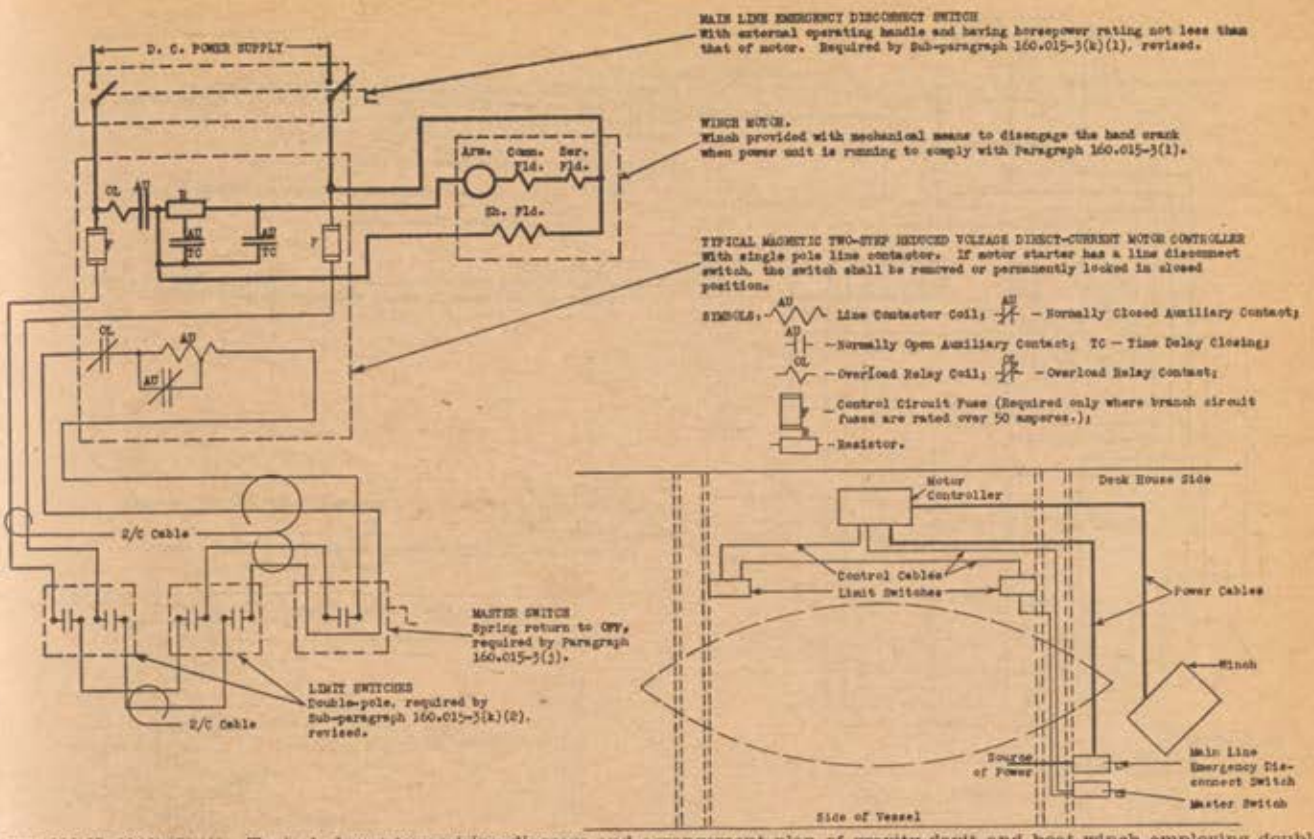


FIGURE 111.65-40(f)(5)(i)—Typical elementary wiring diagram and arrangement plan of gravity davit and boat winch employing double-pole limit switches and main line emergency switch in accordance with Subpart 160.015, Subchapter Q.

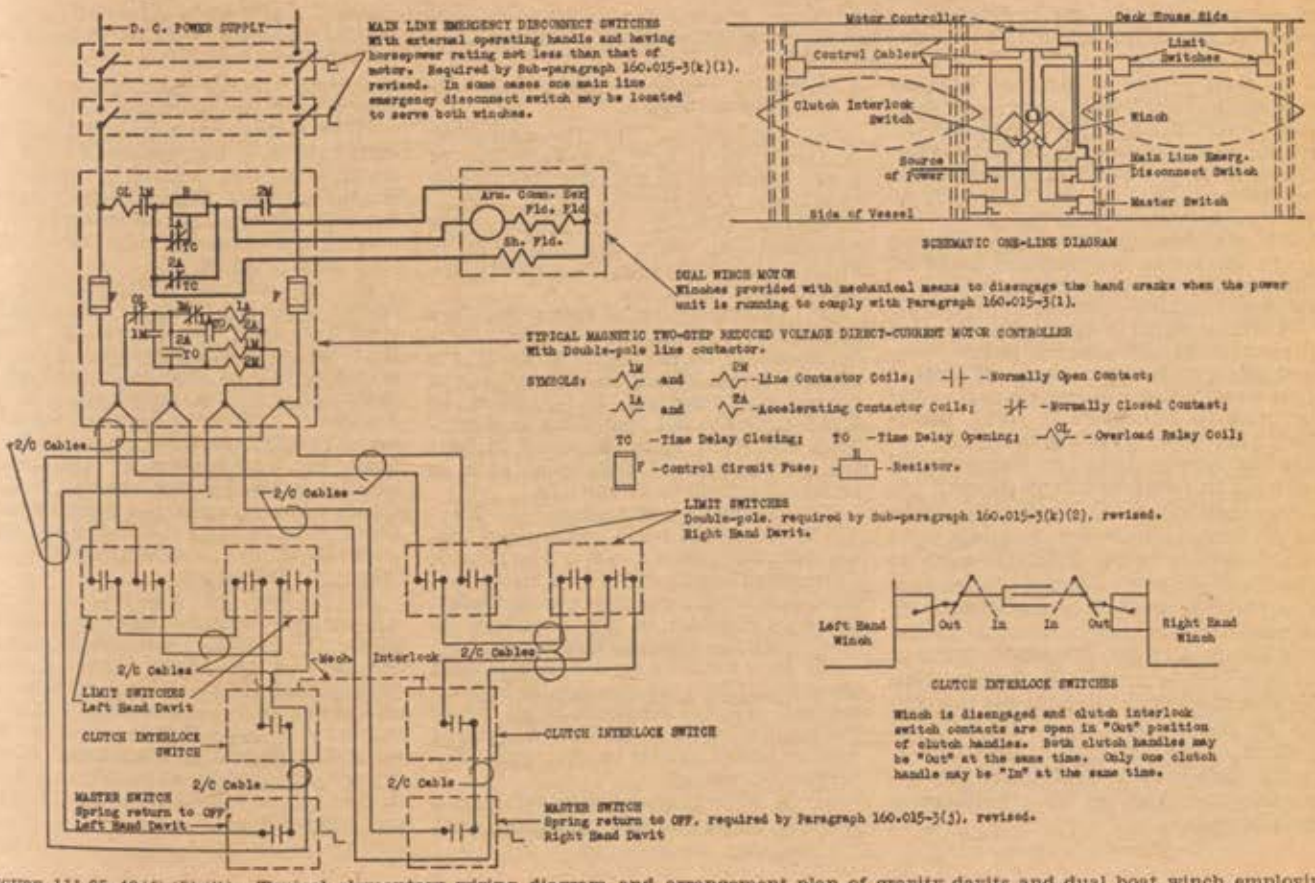


FIGURE 111.65-40(f)(5)(ii)—Typical elementary wiring diagram and arrangement plan of gravity davits and dual boat winch employing double-pole limit switches, clutch interlock switches, and main line emergency switches in accordance with Subpart 160.015, Subchapter Q.

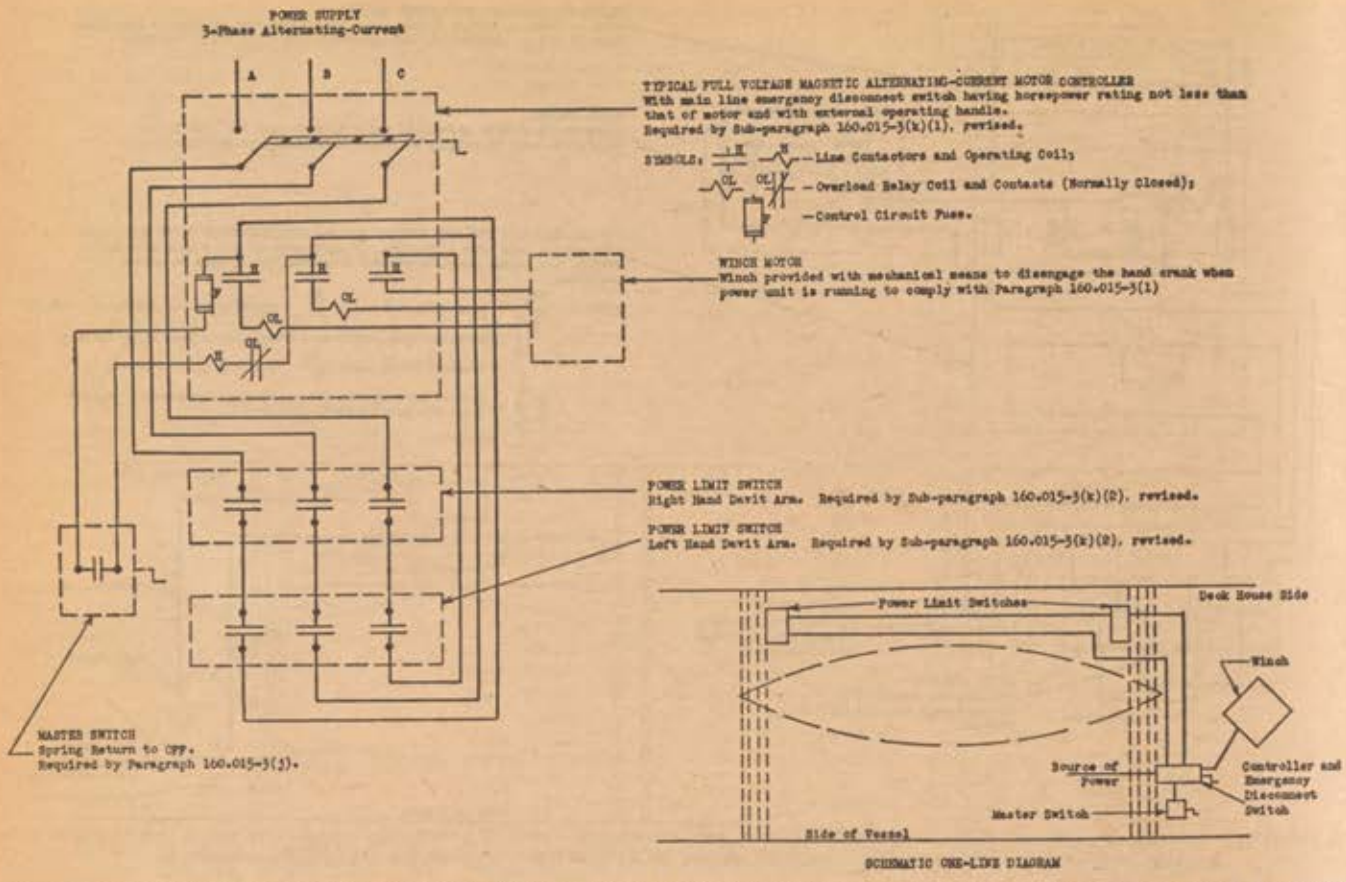


FIGURE 111.65-40(f)(5)(iii)—Typical elementary wiring diagram and arrangement plan of gravity davit and boat winch employing power limit switches and combined starter and main line emergency disconnect switches in accordance with Subpart 160.015, Subchapter Q.

(2) New materials installed to effect compliance with this paragraph shall comply with the applicable requirements of this section. Existing materials continued in service shall comply with the requirements of this section insofar as it is reasonable and practicable.

(3) Modification of existing lifeboat winch electrical installations to effect compliance with this paragraph shall be completed not later than October 1, 1952.

(4) The electrical equipment installed in connection with electric power-operated lifeboat winches used with other than gravity davits on vessels contracted for prior to November 19, 1952, previously approved, but not meeting the applicable specifications or requirements set forth in paragraphs (b) through (f) of this section may be continued in service so long as they are maintained in good condition to the satisfaction of the Officer in Charge, Marine Inspection. Minor repairs and minor alterations may be made to the same standards as the original installation: *Provided*, That, in no case, will a greater departure from the standards of paragraphs (b) through (f) of this section be permitted than presently exist. All new installations or major replacements shall meet the applicable specifications or requirements for new vessels.

§ 111.65-45 Special requirements for electric air heaters.

(a) *Application.* (1) The provisions of this section, with the exception of paragraph (c) of this section, shall apply to all vessels contracted for on or after November 19, 1952. The provisions of paragraph (c) of this section shall apply to all vessels contracted for prior to November 19, 1952.

(2) The provisions of this section are applicable to electrically energized units or panels to be employed in heating a room or compartment for the comfort of the occupants thereof. The provisions of this section are not applicable to electrically energized units employed to heat the air in enclosed apparatus, such as motors, controllers, or the like.

(b) *General requirements.* (1) Electric heaters shall be so constructed that the risk of fire is reduced to a minimum. Unspecified construction and circuit details shall be in accordance with Underwriters' Laboratories, Inc., Standard for Electric Space-Heating Equipment.

(2) Heaters shall be designed to heat the surrounding air principally by convection. Heater elements shall be of the enclosed type. The heater element case or jacket should be of a corrosion-resistant material.

(3) Heaters shall be provided with a thermal cutout of the manually reset type that will prevent overheating and with a suitable regulating switch.

(4) Heaters for bulkhead mounting shall have their top slanted or otherwise designed to prevent hanging towels, etc., on the heater. When heaters are of the portable type, an acceptable clip or bracket shall be fitted to hold the heater in a fixed position.

(5) The external temperature of the heater enclosing case shall not exceed a temperature of 125 degrees C., except that the external temperature of the enclosing case of flush mounted heaters shall not exceed a temperature of 100 degrees C. When heaters are mounted upon, or adjacent to, the deck or bulkhead, the construction of the heater shall be such that the nearest deck or bulkhead surface will not exceed a temperature of 55 degrees C. For test purposes an ambient temperature of 25 degrees C. will be used.

(c) *Electric air heaters on vessels contracted for prior to November 19, 1952.* (1) Existing arrangements, materials, and equipment previously approved shall be considered satisfactory so long as they are maintained in good condition to the satisfaction of the Officer in Charge, Marine Inspection. Minor repairs and minor alterations may be made to the same standard as the original installation.

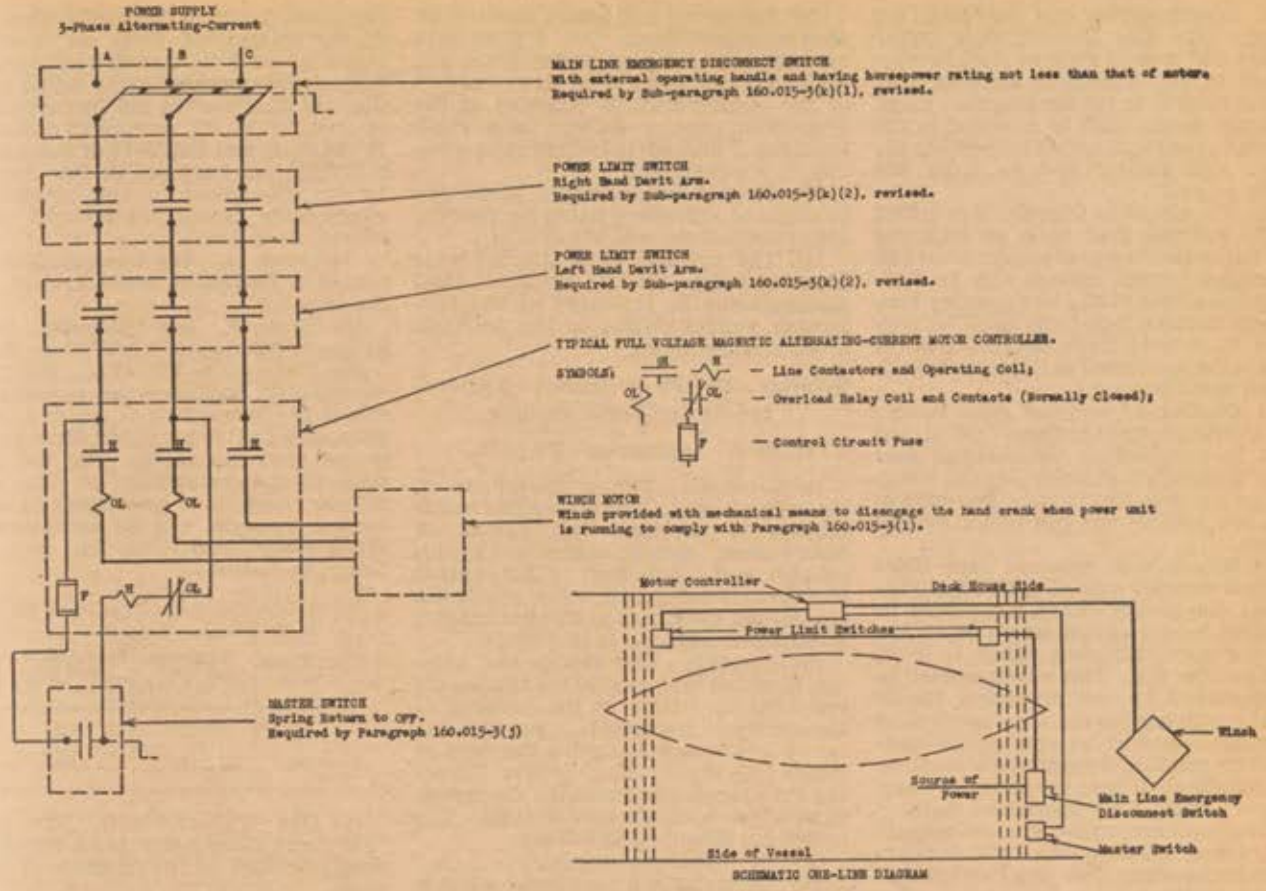


FIGURE 111.65-40(f)(5)(iv)—Typical elementary wiring diagram and arrangement plan of gravity davit and boat winch employing main line emergency switch and power limit switches in accordance with Subpart 160.015, Subchapter Q.

(2) All new installations or major replacements shall meet the applicable specifications or requirements for new vessels.

§ 111.65-50 Special requirements for electric cooking equipment and motor-driven commissary equipment.

(a) *Application.* The provisions of this section, with the exception of paragraph (d) of this section, shall apply to all vessels contracted for on or after November 19, 1956. The provisions of paragraph (d) of this section shall apply to all vessels contracted for prior to November 19, 1956.

(b) *Electric cooking equipment requirements.* (1) All equipment, attachments and devices shall be of rugged construction and so designed as to permit complete cleaning, maintenance and repair with ease.

(2) Doors shall be provided with heavy duty hinges and locking devices to prevent accidental opening in a heavy sea.

(3) Where necessary for safety of personnel, grab rails shall be provided. Ranges shall be provided with sea rails with adjustable barriers to resist accidental cook pot movement.

(4) Means shall be provided to effect positive grease or fat collection and to prevent spillage thereof onto the deck.

(5) All equipment shall be mounted to prevent dislodgment by roll and/or pitch, whether arranged for fixed wiring or for portable wiring.

(6) Each equipment unit shall be provided with means for disconnecting it from all circuit conductors. The disconnecting means shall plainly indicate whether it is in the open or closed circuit position and shall be located in the same compartment with, and within sight of, its associated equipment. The disconnecting means may be an integral part of the equipment provided this device remains unaffected by the heat of the equipment of which it is a part.

(7) Unspecified construction and circuit details shall be in accordance with Underwriters' Laboratories, Inc., Standard for Commercial Electric Cooking Appliances.

(c) *Motor-driven commissary equipment requirements.* (1) All equipment shall be rigidly constructed and self-supporting, and shall be securely mounted whether arranged for fixed wiring or for portable wiring unless such mounting would defeat the utility of the equipment.

(2) The enclosures of motors and controls shall be either watertight or totally enclosed or comparable protection provided.

(d) *Electric cooking equipment and motor-driven commissary equipment on vessels contracted for prior to November 19, 1956.* (1) Existing arrangements, materials, and equipment previously approved shall be considered satisfactory so long as they are maintained in good condition to the satisfaction of the Officer in Charge, Marine Inspection. Minor repairs and minor alterations may be made to the same standard as the original installation.

(2) All new installations or major replacements shall meet the applicable requirements for vessels contracted for on or after November 19, 1956.

§ 111.65-55 Special requirements for electrical steering gears.

(a) *General.* This section contains requirements for steering gear installations where the main or both the main and auxiliary steering means is electric power driven and where the steering control means is electric powered. Where two steering gear power motors and two separate and independent means for controlling the rudder from the pilothouse are provided, there will be two steering systems, each consisting of a power motor, control system, and steering gear feeder. In general these two systems are to be separate on a port and starboard basis. For any different arrangement of the steering gear system, special consideration and approval will be required with the intent of obtaining a steering installation which will be equivalent to the one covered in this section.

(b) *Disconnecting and switching means.* (1) The steering gear power motors and control systems shall be connected to the respective steering gear branch circuits in the steering gear room. Separate means shall be provided in the steering gear room for disconnecting the motor and control systems from the power source.

(2) If a means of transfer is provided in the steering gear room so arranged that either steering gear power motor and associated control system can be connected to either of the two steering gear branch circuits, interlocks shall be provided to prevent both steering systems from being connected to the same branch circuit simultaneously.

(c) *Control of steering gear motors and steering control systems.* (1) Means shall be provided in the steering gear room for starting and stopping the steering gear power motors and any motors that are part of the pilothouse control system.

(2) Where two separate and independent steering control systems are installed, the means of switching shall be provided in the pilothouse to select the steering control system which is to be used for steering. This selection shall be accomplished by one operating handle but the switches for each system shall be in separate enclosures or shall be separated by suitable fire-resistant barriers. The handle shall have positions for "port control", "off", and "starboard control" with such an arrangement to necessitate the passing through the "off" position when transferring from one steering system to the other.

(3) The selecting means in the pilothouse shall be so arranged that the steering gear power motor for the steering system selected will automatically be started if not already running. Any ancillary device necessary to activate the selected remote means for controlling the rudder shall be automatically operated upon starting the steering gear power motor.

(d) *Overcurrent protection for steering systems.* (1) Short circuit protection only shall be provided for the control circuits of controllers of steering gear power motors and motors used for control systems. This protection shall be instantaneous and rated at 400–500 percent of the current-carrying capacity of the conductors.

(2) Indicating and alarm circuits associated with steering installations shall be provided with overcurrent protection in accordance with § 111.45–10(b)(2). Pilothouse steering control systems and any other electric means for controlling the rudder remote from the steering gear room shall be provided with short circuit protection only. The protection shall be instantaneous and rated at 400–500 percent of the current-carrying capacity of the control system conductors. The protection means shall be located in the steering gear room just after the disconnecting means required by paragraph (b)(1) of this section.

(e) *Indicating and alarm systems for steering installations.* (1) A pilot light for each steering gear power motor and each auxiliary motor vital to the control of the rudder shall be provided at the propulsion control station, and other locations if desired, to indicate when the motors are energized.

(2) For the requirements pertaining to overload indicating lights for steering gear pilot motors, see § 111.45–5(p).

(3) The opening of a steering gear branch-circuit circuit breaker shall automatically be indicated at the propulsion control station by the sounding of an audible alarm.

Subpart 111.70 — Special Requirements for Tank Vessels

§ 111.70–1 Application—TB/ALL.

(a) *General.* The requirements of this subpart contain special requirements relative to electrical installations on tank vessels. Except as modified by this subpart and regulations of Subchapter D (Tank Vessels), all other applicable regulations contained in this Subchapter J shall also apply to tank vessels.

(b) *Symbols.* The vessels and services to which each regulation applies are indicated by letters in the heading of the section or paragraph. The first letter or two letters indicates the type of vessel and the letter or letters following the oblique line indicates the waters in which such vessels may operate. The letters are described as follows:

(1) "T" signifies a tankship.

(2) "B" signifies a tank barge when it precedes an oblique line; or it signifies service on bays, sounds, and lakes other than the Great Lakes when it follows an oblique line.

(3) "ALL" signifies service on all waters.

(4) "O" signifies service on ocean waters.

(5) "C" signifies service on coastwise waters.

(6) "L" signifies service on Great Lakes waters.

(7) "R" signifies service on river waters.

§ 111.70–5 Definitions.

(a) *General—TB/ALL.* Certain terms used in this subpart are defined in this section.

(b) *Cargo—TB/ALL.* The term "cargo" means combustible liquid, flammable liquid, or liquefied flammable gas unless otherwise stated.

(c) *Cofferdam—TB/ALL.* The term "cofferdam" means a void or empty space separating two or more compartments for the purpose of isolation or to prevent the contents of one compartment from entering another in the event of the failure of the walls of one to retain their tightness.

(d) *Combustible liquid—TB/ALL.* The term "combustible liquid" means any liquid having a flash point above 80° F. (as determined from an open-cup tester, as used for test of burning oils). Combustible liquids having lethal qualities are those having the characteristics of class "B" or "C" poisons as defined in §§ 146.25–10 and 146.25–15 of Subchapter N (Dangerous Cargoes) of this chapter. In the regulations of this subchapter, combustible liquids are referred to by grades, as follows:

(1) *Grade D.* Any combustible liquid having a flashpoint below 150° F. and above 80° F.

(2) *Grade E.* Any combustible liquid having a flashpoint of 150° F. or above.

(e) *Flashpoint—TB/ALL.* The term "flashpoint" indicates the temperature in degrees Fahrenheit at which a liquid gives off a flammable vapor when heated in an open-cup tester. For the purpose of the regulations in this subchapter, flashpoints determined by other testing methods will be equivalent to those determined with an open-cup tester, as follows:

TABLE 111.70–5 (e)—EQUIVALENT FLASH POINTS

Open-cup tester	Tag closed-cup tester (A. S. T. M.)	Pensky-Martens closed tester (A. S. T. M.)
°F.	°F.	°F.
80	75	----------
150	----------	140

(f) *Gas free—TB/ALL.* The term "gas free" means free from dangerous concentrations of inflammable or toxic gases.

(g) *Flammable liquid—TB/ALL.* The term "flammable liquid" means any liquid which gives off flammable vapors (as determined by flashpoint from an open-cup tester, as used for test of burning oils) at or below a temperature of 80° F. Flammable liquids having lethal qualities are those having the characteristics of class "B" or "C" poisons as defined in §§ 146.25–10 and 146.25–15 of Subchapter N (Dangerous Cargoes) of this chapter. Flammable liquids are referred to by grades, as follows:

(1) *Grade A.* Any flammable liquid having a Reid[1] vapor pressure of 14 pounds or more.

(2) *Grade B.* Any flammable liquid having a Reid[1] vapor pressure under 14 pounds and over 8½ pounds.

(3) *Grade C.* Any flammable liquid having a Reid[1] vapor pressure of 8½ pounds or less and a flashpoint of 80° F. or below.

(h) *Liquefied flammable gas—TB/ALL.* The term "liquefied flammable gas" means any inflammable gas having a Reid[1] vapor pressure exceeding 40 pounds, which has been compressed and liquefied for purposes of transportation.

[1] American Society for Testing Materials Standard D–323 (most recent revision), Method of Test for Vapor Pressure of Petroleum Products (Reid Method).

(i) *Tank barge—B/ALL.* The term "tank barge" means any tank vessel not equipped with means of self-propulsion.

(j) *Tankship—T/ALL.* The term "tankship" means any tank vessel propelled by power or sail.

(k) *Tank vessel—TB/ALL.* The term "tank vessel" means any vessel especially constructed or converted to carry liquid bulk cargo in tanks.

§ 111.70–10 Special requirements for tank vessels contracted for on or after November 19, 1955—TB/ALL.

(a) *Application.* The requirements of this section apply to all tank vessels contracted for on or after November 19, 1955.

(b) *General.* The special installation requirements, in a general manner, are contained in § 32.45–1 of Subchapter D (Tank Vessels) of this chapter, and, in some instances and to some degree, are repeated in this section for completeness of this subchapter.

(1) *Cable location.* Where practicable, electric cable shall be located well inboard from the sides, preferably along or near the centerline, to reduce the risk of injury in the event of collision, but it shall be kept clear of cargo tank openings. Specific additional requirements for cargo pump rooms and enclosed spaces immediately above or adjacent to cargo tanks are covered in paragraph (c) of this section.

(2) *Equipment location.* Except where Grade E liquids only are involved, switchboards, distribution panels, switches, fuses, and other circuit interrupting or power devices shall not be installed in cargo pump rooms nor in enclosed spaces immediately above or adjacent to cargo tanks. Regardless of the grade of liquid cargo handled by a tank vessel, storage batteries shall not be located in cargo pump rooms.

(3) *Explosion-proof installations.* Where explosion-proof equipment is required, the equipment and installation thereof shall comply with § 111.60–40 of this part.

(4) *Portable equipment.* Illumination may be obtained in any compartment by the use of approved explosion-proof, self-contained, battery-fed lamps. Otherwise, no portable electrical equipment of any type shall be used in bulk cargo tanks, fuel oil tanks, cargo pump rooms, or enclosed spaces immediately above or adjacent to bulk cargo tanks unless all the following conditions are met:

(i) The compartment itself is gas-free;

(ii) The compartments adjacent and diagonally adjacent are either (*a*) gas-free, (*b*) inerted, (*c*) filled with water, (*d*) contain Grade E liquid and are closed and secured, or (*e*) are spaces in which inflammable vapors and gases normally are not expected to accumulate; and

(iii) All other compartments of the vessel in which inflammable vapors and gases normally may be expected to accumulate are closed and secured.

(c) *Installation requirements on tank vessels handling Grade A, B, C or D liquid cargo.* The requirements of this paragraph apply only to tank vessels handling Grade A, B, C or D liquid cargo.

(1) *Lighting of cargo pump rooms.* (i) Except as otherwise permitted by subdivision (ii) of this subparagraph, cargo pump rooms shall be lighted through permanently fixed glass lenses fitted in the bulkhead and/or overhead. Each fixed glass lens shall be of rugged construction and arranged to maintain the watertight and gastight integrity of the structure. The fixed glass lens may form a part of a lighting fixture provided that all of the following conditions are complied with: (*a*) No means of access to the interior of the fixture from the pump room is provided; (*b*) The fixture is vented to the engine room or a similar non-hazardous area; (*c*) The fixture is wired from outside the pump room; and (*d*) The maximum observable temperature on the pump room surface of the glass lens based on an ambient temperature of 40° C. shall not exceed 180° C.

(ii) Where the location of a cargo pump room does not permit the lighting arrangement of subdivision (i) of this subparagraph, or where the lighting arrangement of subdivision (i) of this subparagraph, if used, would not provide the required illumination, approved explosion-proof lighting fixtures may be installed. Specific approval by the Commandant is required for the installation of approved explosion-proof lights, associated wiring and accessories.

(2) *Lighting of enclosed spaces.* Lighting of the enclosed spaces immediately above or adjacent to cargo tanks either shall comply with the requirements of subparagraph (1) of this paragraph applicable to cargo pump rooms or may be effected or supplemented by means of explosion-proof fixtures located in these spaces.

(3) *Cable.* Through runs of electric cable, regardless of how they may be protected, are prohibited in cargo pump rooms. In any enclosed space immediately above or adjacent to cargo tanks other than cargo pump rooms, through runs of electric cable are permitted.

(4) *Weather decks.* Motors, their control equipment, and other electrical equipment and installations located on or above the weather decks within 10 feet of the cargo tank openings, cargo pumproom doors or ventilation outlets, or cargo tank vent terminations shall be explosion-proof. Explosion-proof equipment installed in locations exposed to the weather shall be waterproof or shall be enclosed in watertight housings.

§ 111.70–90 Special requirements for tank vessels constructed prior to November 19, 1955—TB/ALL.

(a) *General installation requirements for tank vessels the construction or conversion of which was started on or after November 10, 1936, but prior to November 19, 1955*—(1) *Application.* The requirements of this paragraph shall apply to all tank vessels the construction or conversion of which was started on or after November 10, 1936, but prior to November 19, 1955.

(2) *General.* The electrical installation shall be in compliance with this paragraph, and to the extent that such installation is not covered by this paragraph, it shall be at least equivalent to the Commandant's general requirements.

(3) *Existing arrangements.* (i) Existing arrangements, materials, and facilities previously approved will be considered satisfactory so long as they are maintained in good condition to the satisfaction of the Officer in Charge, Marine Inspection. Minor repairs or minor alterations may be made to the same standard as the original installation.

(ii) Any major change in the electrical installation or any conversion shall comply with the requirements covered by §§ 111.70–1 and 111.70–10.

(4) *Location of cables.* Where practicable, electrical cable is to be located well inboard from the sides, preferably along or near the centerline, to reduce the risk of injury in the event of collision, but it shall be kept clear of cargo tank openings. Except where Grade E liquids only are involved, feeders shall be run as far as practicable to avoid cargo pump rooms and enclosed spaces immediately adjoining cargo tanks.

(5) *Cable armor.* The armor on all cables shall be electrically and mechanically continuous.

(6) *Location of circuit-interrupting devices.* Except where Grade E liquids only are involved, switchboards, distribution panels, switches, fuses, and other current-interrupting devices shall not be fitted in cargo pump rooms or enclosed spaces immediately adjoining cargo tanks.

(7) *Portable equipment.* Portable extension cables and fittings are to be of an approved type.

(8) *Overload protection.* Main distribution circuits shall be protected against overload by circuit breaking devices, the capacity of which shall be marked at each such device.

(9) *Storage batteries.* Storage batteries shall not be located in cargo pump rooms. The space in which they are located shall be well ventilated and they shall be protected against mechanical and electrical injury including short circuiting and overloading. Batteries shall be secured against movement, and acid batteries shall be set in lead-lined trays at least 3 inches deep of at least 4-pound sheet lead.

(10) *Installations made during the Unlimited National Emergency.* Electrical equipment installed during the Unlimited National Emergency as defined in § 110.25–5 of this subchapter and not complying with the requirements of the regulations in this subchapter may be continued in service if found to be satisfactory by the Commandant for the purpose intended.

(11) *Portable equipment.* When the vessel is not gas free, no portable electrical equipment shall be used in the cargo or fuel oil tanks, the cargo pump rooms or any enclosed space immediately above or adjacent to the bulk cargo tanks, except as permitted by § 111.70–10 (b) (4).

(b) *Cargo pump rooms and enclosed spaces of tank vessels constructed on or after July 1, 1951, but prior to November*

19, 1955—(1) *Application.* The requirements of this paragraph shall apply to cargo pump rooms and enclosed spaces immediately above the bulk cargo tanks of all tank vessels carrying Grade A, B, C, or D liquid cargo the construction or conversion of which vessels was started on or after July 1, 1951, but prior to November 19, 1955. There are no special restrictions in regard to the electrical installations in cargo pump rooms and enclosed spaces of tank vessels carrying only Grade E liquid cargo.

(2) *Equipment.* No electric lighting or power circuit-interrupting or power devices shall be installed in pump rooms or enclosed spaces immediately above the bulk cargo tanks. Through runs of electrical cable are permitted.

(3) *Lighting.* Lighting of pump rooms or the enclosed spaces immediately above the bulk cargo tanks shall be effected by means of approved explosion-proof or magazine type lighting fixtures. When the vessel is not gas free no portable lighting equipment shall be used except as permitted by § 111.70–10 (b) (4).

(c) *General cargo spaces of tank vessels constructed on or after July 1, 1951, but prior to November 19, 1955.* Regardless of location, general cargo spaces of tank vessels carrying Grade E liquid cargo only and constructed on or after July 1, 1951, but prior to November 19, 1955, shall have no special restrictions in regard to electrical installations.

(d) *Cargo pump rooms and enclosed spaces of tank vessels constructed on or after November 10, 1936, but prior to July 1, 1951*—(1) *Application.* The requirements of this paragraph shall apply to cargo pump rooms for Grade A, B, C or D liquid and to enclosed spaces required to segregate Grade A, B, C or D liquid cargo tanks from other spaces, all on tank vessels the construction or conversion of which was started on or after November 10, 1936, and prior to July 1, 1951.

(2) *Wiring.* Wiring is to be leaded and armored and shall be run through approved gastight fittings having stuffing glands at inlets and outlets.

(3) *Boxes.* Joints in wiring shall be made only in wiring appliances, such as junction boxes, outlet boxes, etc., and such boxes shall be completely metallic and shall be gastight.

(4) *Lighting fixtures.* Lighting fixtures shall be of approved type.

(5) *Motors.* Electric motors shall be of approved type either totally enclosed or ventilated to the atmosphere by suction and discharge air ducts. Separately ventilated motors are to have pressure type ventilation and shall be arranged with an automatic shutoff to open the circuit when the ventilating fan motor stops. The system is to be so interlocked that the pump motor cannot be started prior to a circulation of air. The air ducts are to lead to and from the atmosphere outside the pump room and are to terminate not less than 3 feet above the deck and not less than 6 feet from any cargo tank vent. (See § 32.-60–20 of Subchapter D (Tank Vessels) of this chapter.)

(e) *General installation requirements for tank vessels the construction or conversion of which was started prior to November 10, 1936*—(1) *Application.* The requirements of this paragraph shall apply to all steel hull tank vessels the construction or conversion of which was started prior to November 10, 1936.

(2) *General requirements.* The electrical installation shall be maintained in a safe and in a good mechanical condition, and shall comply with the regulations in effect when the vessel was built, or to the requirements of a recognized classification society. Any major change in the electrical installation or any conversion shall comply with the requirements covered by §§ 111.70–1 and 111.70–10.

(3) *Pump rooms and enclosed spaces.* The electrical installation in pump rooms and enclosed spaces immediately adjoining cargo tanks (except in pump-engine rooms as provided in § 32.70–20 of Subchapter D (Tank Vessels) of this chapter) of steel hull tank vessels handling Grade A, B, C, or D products shall be made to comply with §§ 111.55–1, 111.55–15, 111.60–5, 111.70–10 (b) (1), 111.70–10 (b) (2), 111.70–90 (a) (2), 111.70–90 (a) (9), 111.70–90 (b), and 111.70–90 (d), to the extent that the changes required are, in the opinion of the Officer in Charge, Marine Inspection, necessary in the interest of safety.

(4) *Portable equipment.* When the vessel is not gas free, no portable electrical equipment shall be used in the cargo or fuel oil tanks, the cargo pump rooms, or any enclosed space immediately above or adjacent to the bulk cargo tanks, except that lighting in these spaces may be effected by the use of approved explosion-proof, self-contained, battery-fed lamps.

Subpart 111.90—Electrical Equipment and Installations on Vessels Contracted for Prior to November 19, 1952

§ 111.90–1 General.

The electrical installations on existing vessels shall be maintained in good electrical and mechanical condition to the satisfaction of the Officer in Charge, Marine Inspection.

§ 111.90–5 Major alterations.

(a) Major alterations and major extensions to electrical installations on existing vessels shall be made to the same standard as required for new vessels. Minor repairs and minor alterations may be made to the same standard as the original installation as described in §§ 111.70–90, 111.90–10, 111.90–15, 111.90–20, and 111.90–25: *Provided*, That, in no case, will a greater departure from the standards of this subchapter be permitted than presently exist.

§ 111.90–10 Vessels contracted for prior to July 2, 1937.

(a) Except as otherwise provided for tank vessels in § 111.70–90, the installation on vessels contracted for between June 30, 1928, and July 1, 1937, inclusive, using electricity for any purpose, shall be in keeping with the best modern practice.

(b) Except as otherwise provided for tank vessels in § 111.70–90, the changes or alterations in the electrical installations on vessels contracted for prior to June 30, 1928, shall be in accordance with the requirements of this section.

§ 111.90–15 Vessels contracted for between July 2, 1937, and January 1, 1939.

(a) Except as otherwise provided for tank vessels in § 111.70–90, the electrical installation on vessels contracted for between July 2, 1937, and January 1, 1939, inclusive, shall be in accordance with the "Recommended Practice for Electrical Installations on Shipboard," AIEE Standard No. 45, October 1930, as published by the Institute of Electrical and Electronic Engineers.

§ 111.90–20 Vessels contracted for between January 2, 1939, and June 1, 1941.

(a) Except as otherwise provided for tank vessels in § 111.70–90, the electrical installation on vessels contracted for between January 2, 1939, and June 1, 1941, inclusive, shall be in accordance with the "Recommended Practice for Electrical Installations on Shipboard," AIEE Standard No. 45, December 1938, as published by the American Institute of Electrical Engineers.

§ 111.90–25 Vessels contracted for between June 2, 1941, and November 18, 1952.

(a) Except as otherwise provided for tank vessels in § 111.70–90, the electrical installation on vessels contracted for between June 2, 1941, and November 18, 1952, inclusive, shall be in accordance with the "Recommended Practice for Electrical Installations on Shipboard," AIEE Standard No. 45, July 1940, as published by the Institute of Electrical and Electronic Engineers.

(b) Except as otherwise provided for tank vessels in § 111.70–90, the specification covering electrical installations titled "United States Coast Guard, Merchant Marine Inspection, Specification for Electrical Installations on Merchant Vessels," dated August 31, 1944, revised March 6, 1945, is, during the Unlimited National Emergency, applicable as alternative provisions to those contained in this section for vessels the contract for the construction of which was signed prior to September 2, 1945.

(c) Except as otherwise provided for tank vessels in § 111.70–90, those parts of the specification covering electrical installations titled "United States Coast Guard, Merchant Marine Inspection, Specification for Electrical Installations on Merchant Vessels," dated August 31, 1944, revised March 6, 1945, specified in paragraphs 1, 4 and 5, thereof relating to electric cable, are, during the Unlimited National Emergency, applicable as alternative provisions to those contained in this section for vessels the contract for the construction of which was signed on and after September 2, 1945.

PART 112—EMERGENCY LIGHTING AND POWER SYSTEM

Subpart 112.01—Application

Sec.
112.01–1 General.

Subpart 112.05—General Requirements

112.05–1 Intent.
112.05–5 Emergency source of supply.
112.05–10 Emergency lights.
112.05–15 Emergency lighting system for small passenger vessels.

Subpart 112.10—Classifications of Emergency Lighting and Power Systems

112.10–1 General.
112.10–5 Manual emergency lighting and power system.
112.10–10 Automatic emergency lighting and power system.
112.10–15 Temporary source of emergency lighting and power.
112.10–20 Final source of emergency lighting and power.

Subpart 112.15—Emergency Loads

112.15–1 Temporary emergency source loads.
112.15–5 Final emergency source loads.
112.15–10 Single automatically started source loads.
112.15–15 Manually started source loads.

Subpart 112.20—Operation of Emergency Systems Having Both a Temporary and a Final Source of Emergency Lighting and Power

112.20–1 Emergency Loads.
112.20–5 Failure of power from the normal source.
112.20–10 Diesel driven emergency source of power.
112.20–15 Potential of final source.

Subpart 112.25—Operation of Emergency System Having an Automatic Starting Diesel-Engine-Driven Emergency Generator as the Sole Source of Emergency Lighting and Power

112.25–1 Emergency Loads.
112.25–5 Reduction of potential.
112.25–10 Operation requirements.

Subpart 112.30—Operation of Emergency Systems Having an Automatically Connected Storage Battery as the Sole Source of Emergency Lighting and Power

112.30–1 Emergency loads.
112.30–5 Reduction of potential.
112.30–10 Operation requirements.

Subpart 112.35—Operation of a Manually Controlled Emergency System Having a Storage Battery or a Diesel-Engine-Driven Generator as the Sole Source of Emergency Lighting and Power

112.35–1 Manual operation requirements.
112.35–5 Means for starting.

Subpart 112.40—Installations Requiring an Alternating-Current Temporary Source of Supply

112.40–1 General requirements.

Subpart 112.45—Visible Indicators and Test Switch

112.45–1 Visible indicators.
112.45–5 Test switch.

Subpart 112.50—Emergency Diesel-Engine-Driven Generator Sets

112.50–1 General requirements.

Subpart 112.55—Storage Battery Installation

112.55–1 General requirements.
112.55–5 Emergency lighting loads.
112.55–10 Storage battery requirements.
112.55–15 Capacity of storage battery.
112.55–20 Diesel engine cranking batteries.

Subpart 112.90—Emergency Lighting and Power Systems for Vessels Contracted for Prior to November 19, 1952

112.90–1 General.
112.90–5 Emergency lighting system for ocean and coastwise passenger vessels contracted for prior to November 19, 1952.
112.90–10 Emergency lighting system for passenger vessels other than ocean and coastwise passenger vessels contracted for prior to November 19, 1952.

AUTHORITY: The provisions of this Part 112 issued under R.S. 4405, as amended, 4462, as amended; 46 U.S.C. 375, 416. Interpret or apply R.S. 4399, as amended, 4400, as amended, 4417, as amended, 4417a, as amended, 4418, as amended, 4421, as amended, 4426, as amended, 4427, as amended, 4433, as amended, 4453, as amended, 4488, as amended, 4491, as amended, sec. 14, 29 Stat. 690, as amended, sec. 10, 35 Stat. 428, as amended, 41 Stat. 305, as amended, sec. 5, 49 Stat. 1384, as amended, secs. 1, 2, 49 Stat. 1544, 1545, as amended, sec. 17, 54 Stat. 166, as amended, sec. 3, 54 Stat. 347, as amended, sec. 3, 70 Stat. 152, sec. 3, 68 Stat. 675; 46 U.S.C. 361, 362, 391, 391a, 392, 399, 404, 405, 411, 435, 481, 489, 366, 395, 363, 369, 367, 526p, 1333, 390b, 50 U.S.C. 198; E.O. 11239, July 31, 1965, 30 F.R. 9671, 3 CFR, 1965 Supp. Treasury Department Orders 120, July 31, 1950, 15 F.R. 6521; 167–14, Nov. 26, 1954, 19 F.R. 8026; 167–20, June 18, 1956, 21 F.R. 4894; CGFR 56–28, July 24, 1956, 21 F.R. 5659; 167–38, Oct. 26, 1959, 24 F.R. 8857.

Subpart 112.01—Application

§ 112.01–1 General.

The provisions of this part, with the exception of Subpart 112.90, shall apply to all vessels contracted for on or after November 19, 1952. The provisions of Subpart 112.90, shall apply to all vessels contracted for prior to November 19, 1952.

CROSS REFERENCE: See § 110.05–3 of this subchapter for application of amendments to regulations.

Subpart 112.05—General Requirements

§ 112.05–1 Intent.

(a) The intent of the provisions in this part is to assure that vessels are provided with a dependable, independent emergency source of electrical power with sufficient capacity to supply all those services that are necessary for the safety of the passengers and/or the crew in an emergency.

(b) Nonemergency loads may be supplied from the emergency source only when the emergency source has adequate capacity to supply all loads that may be connected to the emergency source simultaneously.

§ 112.05–5 Emergency source of supply.

(a) The emergency source of supply shall be of a type and capacity in accordance with Table 112.05–5(a), except as otherwise provided by § 112.05–15.

TABLE 112.05–5(a)

Size of vessel and service	Type or types of emergency source of power	Period of operation and minimum capacity of emergency source of power
Passenger vessels over 65 feet in length		
Ocean and Coastwise, 1,600 g.t. and over, and any passenger vessel, regardless of tonnage or service, where electric power-operated watertight doors are required.	Storage battery with automatic transfer gear for temporary source, and supplemented by diesel generator with automatic starting and transfer gear for final source.	½ hour. 36 hours.
Ocean and Coastwise, over 15 g.t. but less than 1,600 g.t.[1]	Storage battery with automatic transfer gear or diesel generator with automatic starting and transfer gear.	36 hours or twice the time of run, whichever is the smaller.
Other than Ocean and Coastwise, 100 g.t. and over.[1]	Storage battery with automatic transfer gear or diesel generator with automatic starting and transfer gear.	8 hours or twice the time of run, whichever is the smaller.
Other than Ocean and Coastwise, over 15 g.t. but less than 100 g.t.[1]	Storage battery or diesel generator with automatic or manual operation.[2]	8 hours or twice the time of run, whichever is the smaller.
Cargo and miscellaneous self-propelled vessels and tank ships; barges with sleeping accommodations for more than 6 persons.[3]		
All waters, 1,600 g.t. and over.	Storage battery or diesel generator automatic or manual operation.	12 hours.
All waters, 300 g.t. and over, but less than 1,600 g.t.	Storage battery or diesel generator, automatic or manual operation, or approved relay-controlled battery-operated lanterns.[5]	12 hours or twice the time of run, whichever is the smaller.[4]

[1] See also § 112.05–15.
[2] See also §§ 112.35–1 and 112.35–5.
[3] Applicable to barges contracted for on or after November 19, 1958.
[4] Minimum period of operation of relay-controlled, battery-operated lanterns may be less than 12 hours but not less than 8 hours.
[5] Battery-operated lanterns shall have rechargeable batteries, shall incorporate an automatic battery charger that will maintain the battery in a fully charged condition, and shall not be readily portable.

(b) The emergency source of supply shall be independent of the vessels' ship's service lighting and powerplant and propulsion plant.

(c) The complete emergency installation shall function satisfactorily when the ship is inclined 22½ degrees and/or when the trim of the ship is 10 degrees.

(d) The emergency source of supply shall be located aft of the collision bulkhead and outside the machinery casing.

(1) On passenger vessels the emergency source of supply shall be located above the bulkhead deck or above the freeboard deck, whichever is the higher.

(2) On cargo and miscellaneous vessels, including tankships and barges, the emergency source of supply shall be located above the freeboard deck, or above the uppermost continuous deck, whichever is the higher.

(e) When a compartment containing the emergency source of electric power, or vital components thereof, adjoins a space containing either the ship's service generators or machinery necessary for the operation of the ship's service generators, all common bulkheads and/or decks shall be protected by approved "structural insulation" or other approved material. This protection shall be such as to be capable of preventing an excessive temperature rise in the space containing the emergency source of electric power, or vital components thereof, for a period of at least one hour in the event of fire in the adjoining space. Bulkheads or decks meeting Class A-60 requirements, as defined by § 72.05-10 in Subchapter H (Passenger Vessels) of this chapter, will be considered as meeting the requirements of this paragraph.

(f) Except for those cables used to connect equipment located in the engineroom or boilerroom, all cables emanating from the emergency switchboard shall be run so as to avoid penetrating the boundaries of the engineroom, boilerroom or the uptakes and casings of these spaces. All such cables shall be kept clear of the bulkheads and decks forming these boundaries.

(g) The emergency switchboard shall be installed as near as practicable to the emergency source of power.

(h) When the emergency source of power is a generator, the emergency switchboard shall be located in the same space as the emergency source of power, unless the operation of the emergency switchboard would thereby be impaired.

§ 112.05-10 Emergency lights.

(a) Emergency lights supplied by an automatic emergency lighting system shall form a part of the regular lighting system, and shall be continuously lighted at all times passengers or crew are aboard, except as provided by paragraph (b) of this section and § 112.05-15(c), and except when the emergency lights consist of relay-controlled battery-operated lanterns. (See footnote 5 in Table 112.05-5(a).)

(b) Emergency lights for the illumination of boats and embarkation decks, lifeboat launching gear, wheelhouse, chart room, and navigating instruments need not be continuously lighted and, except as provided otherwise in this paragraph, shall be controlled by switches located in the wheelhouse.

(1) On "island type" vessels, such as tankers and Great Lakes' bulk freighters, lighting for illumination of lifeboats, launching gear and embarkation areas remote from the wheelhouse island may be controlled from a central location within the island involved in lieu of from the wheelhouse.

(c) Emergency lights shall be marked with a letter "E" of at least ½-inch in height as required by § 78.47-33 of Subchapter H (Passenger Vessels), and § 97.37-25 of Subchapter I (Cargo and Miscellaneous Vessels) of this chapter.

§ 112.05-15 Emergency lighting system for small passenger vessels.

(a) Small passenger vessels, certificated to operate only between sunrise and sunset, may be permitted to operate without an emergency lighting system.

(b) Small passenger vessels, certificated to operate not more than 15 miles offshore, may be permitted to operate without an emergency lighting system provided all of the conditions, where applicable, contained in this paragraph are complied with.

(1) The source of supply of the general lighting system must be independent of the propulsion plant.

(2) On vessels required to meet at least a one compartment standard of subdivision, the source of supply of the general lighting system must be located above the bulkhead deck.

(c) On small passenger vessels having no sleeping accommodations for passengers and requiring not more than 10 emergency lights, the automatic emergency lighting system need not form a part of the regular lighting system and need not be continuously lighted. Individual storage-battery-operated automatic emergency lighting units will be acceptable for such vessels in lieu of a single source emergency lighting system provided the units incorporate an automatic battery charger, are not readily portable, and have sufficient capacity for not less than 6 hours continuous operation.

Subpart 112.10—Classifications of Emergency Lighting and Power Systems

§ 112.10-1 General.

(a) Emergency lighting and power systems are classified in accordance with the method provided to cause the system to apply potential to the emergency loads and in accordance with the basic function of the system.

§ 112.10-5 Manual emergency lighting and power system.

(a) A manual emergency lighting and power system is one in which a single manual operation, such as the manual operation of a switch from an "off" to an "on" position, is required to cause the emergency lighting and power system to supply power to the emergency loads.

§ 112.10-10 Automatic emergency lighting and power system.

(a) An automatic emergency lighting and power system is one in which a specified reduction in potential from the ship's service power and lighting plant will cause the emergency lighting and power system to supply power to the emergency loads.

§ 112.10-15 Temporary source of emergency lighting and power.

(a) A temporary source of emergency lighting and power is one of limited capacity designed to carry, for a short time, selected emergency loads while an emergency source of larger capacity is being started.

§ 112.10-20 Final source of emergency lighting and power.

(a) A final source of emergency lighting and power is one designed to function subsequent to the termination of the temporary source.

Subpart 112.15—Emergency Loads

§ 112.15-1 Temporary emergency source loads.

(a) The emergency lighting and power loads listed in this section shall be arranged so that they can be energized from the temporary emergency source.

(b) Navigation light indicator panel, if required by § 113.55-25 of this subchapter.

(c) A sufficient number of lights throughout machinery spaces to permit the performance of essential operations and observations under emergency conditions and to facilitate restoration of service.

(d) Lighting for passageways, stairways, and escape trunks in passenger quarters, crew quarters, public spaces, machinery spaces and work spaces, adequate to permit passengers and crew readily to find their way to open decks and to lifeboat embarkation and assembly points with all watertight doors and fire screen doors closed.

(e) Illuminated signs bearing the word "Exit" in red letters shall be installed in such locations throughout a passenger vessel so that from any portion of the vessel normally accessible to the passengers or crew, except machinery spaces, and except stores and similar spaces where the crew are not normally employed, and with all fire doors in stairway inclosures and main vertical zone bulkheads closed and all watertight doors closed, the direction of escape to the open deck will be apparent. For the purpose of this paragraph, individual staterooms and other similar small rooms will not be required to have such signs, but upon emerging from such rooms the direction of escape shall be apparent. (Also see § 111.50-15 (d) of this subchapter.)

(f) General illumination for safe operation of watertight doors, if installed and power operated.

(g) One or more lights in galleys, pantries, steering gear room, emergency power rooms, chart room, wheelhouse, and crews' mess and recreation rooms.

(h) Lighting for boat and embarkation decks and passenger assembly points for safe embarkation into the lifeboats.

(i) Electric communication systems essential under temporary emergency conditions and which do not have an independent storage battery source of power.

(j) Watertight door system, if installed and power operated.

(k) Emergency loudspeaker system, if installed.

(l) Fire screen door holding and release system, if installed.

(m) Supply to motor-generator or other conversion equipment where a temporary emergency source of alternating current is necessary for essential

communication systems, emergency or safety requirements.

§ 112.15–5 Final emergency source loads.

(a) The emergency lighting and power loads listed in paragraphs (b) to (l), inclusive, of this section shall be arranged so that they can be energized from the final source. It is recommended that loads listed in paragraphs (j) to (p), inclusive, of this section be arranged so that they can be energized from the final source where the capacity and character of the emergency plant will permit.

(b) All loads listed in § 112.15–1, as indicated.

(c) Illumination for the safe operation of the lifeboat and liferaft launching gear and the lifeboats and liferafts in the process of, and immediately after, being launched.

(d) Charging panels of temporary emergency battery and of starting battery for diesel engine driving emergency generator.

(e) One of the bilge pumps, if dependent upon the emergency generator for its source of power to comply with Part 55 of Subchapter F (Marine Engineering) of this chapter.

(f) One of the fire pumps, if dependent upon the emergency generator for its source of power to comply with Part 34 of Subchapter D (Tank Vessels), Part 76 of Subchapter H (Passenger Vessels), or Part 95 of Subchapter I (Cargo and Miscellaneous Vessels) of this chapter.

(g) Sprinkler system pump or water spray extinguishing system pump, if dependent upon the emergency generator for its source of power to comply with Part 76 of Subchapter H (Passenger Vessels) of this chapter.

(h) Daylight signaling lights, if installed.

(i) Smoke detector system, if installed.

(j) Radio installation, if installed.

(k) Radio direction finder, if installed.

(l) Loran, if installed.

(m) Radar plan position indicator, if installed.

(n) Gyrocompass, if installed.

(o) Depth sounder, if installed.

(p) Electric whistle and siren control, if installed.

§ 112.15–10 Single automatically started source loads.

When only a single automatically started source of emergency lighting and power is installed, the circuits listed in § 112.15–5, as indicated, shall be arranged so that they can be energized from the single emergency source of supply.

§ 112.15–15 Manually started source loads.

(a) When a manually started emergency lighting and power system is installed, the circuits listed in § 112.15–5, as indicated, shall be arranged so that they may be energized from the emergency source of supply.

Subpart 112.20—Operation of Emergency Systems Having Both a Temporary and a Final Source of Emergency Lighting and Power

§ 112.20–1 Emergency loads.

(a) The emergency loads listed in Subpart 112.15, as indicated, shall normally be energized from the ship's service generating plant through automatic transfer switches.

§ 112.20–5 Failure of power from the normal source.

(a) In the event of a reduction of potential of the normal source by 15 to 40 percent of normal value, the loads listed in § 112.15–1 shall automatically be supplied from the temporary source of emergency lighting and power. For systems in which a reduction of frequency of the normal source or final source will adversely affect the emergency system and emergency loads, suitable means shall be provided to transfer the loads listed in § 112.15–1 to the temporary source.

§ 112.20–10 Diesel driven emergency source of power.

(a) Simultaneous with the operation described in § 112.20–5, the diesel engine driving the final source (emergency generator) shall automatically be started with no load connected to the emergency generator.

§ 112.20–15 Potential of final source.

(a) When the potential of the final source (emergency generator) reaches 85 to 95 percent of normal value, the emergency loads listed in Subpart 112.15, as indicated, shall automatically be transferred to this final source.

(b) When potential from the ship's service generating plant has been restored to normal, the emergency loads may be manually transferred to the normal source and the emergency generator manually stopped.

(c) Should the potential of the final source (emergency generator), while supplying the emergency loads, fall below 75 to 85 percent of normal value, the temporary emergency loads shall again be transferred to the temporary source as described in § 112.20–5.

Subpart 112.25—Operation of Emergency System Having an Automatic Starting Diesel-Engine-Driven Emergency Generator as the Sole Source of Emergency Lighting and Power

§ 112.25–1 Emergency loads.

(a) The emergency loads listed in § 112.15–5, as indicated, shall normally be energized from the ship's service generating plant through automatic transfer switches.

§ 112.25–5 Reduction of potential.

(a) In the event of failure of power from the normal source, such as a reduction of potential by 15 to 40 percent of normal value, the engine driving the emergency generator shall automatically be started with no load connected to the emergency generator.

§ 112.25–10 Operation requirements.

(a) When the potential of the emergency generator reaches 85 to 95 percent of normal value, the emergency loads shall automatically be connected to the emergency generator.

(b) When potential from the ship's service generating plant has been restored to normal, the emergency loads may be manually transferred to the normal source and the emergency generator manually stopped.

Subpart 112.30—Operation of Emergency Systems Having an Automatically Connected Storage Battery as the Sole Source of Emergency Lighting and Power

§ 112.30–1 Emergency loads.

(a) The emergency loads listed in § 112.15–5, as indicated, shall normally be energized from the ship's service generating plant through automatic transfer switches.

§ 112.30–5 Reduction of potential.

(a) Upon reduction of potential from the normal source by 15 to 40 percent of normal value, the emergency loads shall automatically be disconnected from the normal source and connected to the emergency storage battery.

§ 112.30–10 Operation requirements.

(a) Upon restoration of potential from the normal source of 85 to 95 percent of normal values, the emergency loads shall automatically be transferred back to the normal source.

Subpart 112.35—Operation of a Manually Controlled Emergency System Having a Storage Battery or a Diesel-Engine-Driven Generator as the Sole Source of Emergency Lighting and Power

§ 112.35–1 Manual operation requirements.

(a) Manually started emergency lighting and power systems shall require only a single manual operation, such as the manual operation of a switch from an "off" to an "on" position, to cause the emergency system to supply its connected loads.

§ 112.35–5 Means for starting.

(a) The starting means shall be located in the wheelhouse or so as to be under the control of the chief engineer.

Subpart 112.40—Installations Requiring an Alternating-Current Temporary Source of Supply

§ 112.40–1 General requirements.

(a) Installations requiring alternating current for the operation of communication equipment or other apparatus essential under temporary emergency conditions shall be provided with the necessary conversion equipment. Where such conversion equipment will be op-

erating both under normal conditions and under temporary emergency conditions, the conversion equipment shall be provided in duplicate.

Subpart 112.45—Visible Indicators and Test Switch

§ 112.45–1 Visible indicators.

(a) Visible indicators shall be provided in the machinery space to indicate when the emergency battery is being discharged and when the emergency loads are being supplied by an automatically controlled emergency source of supply (storage battery or emergency diesel generator).

§ 112.45–5 Test switch.

(a) A test switch shall be provided at the emergency switchboard or other location as may be approved to simulate a failure of potential from the normal source, the operation of which switch will cause the emergency loads to be transferred.

Subpart 112.50—Emergency Diesel-Engine-Driven Generator Sets

§ 112.50–1 General requirements.

(a) The diesel engine of the generator set shall be complete with all accessories necessary for operation and protection of the engine, shall have a self-contained cooling system of size to assure continuous engine operation using 100° F. air, and the fuel used shall have a flash point of not less than 110° F. The room in which the set is located shall be provided with suitable intake and exhaust ducts to supply adequate cooling air. The diesel engine as installed shall be without starting aid except that a thermostatically controlled electric water jacket heater, connected to the final emergency bus, may be employed. The diesel engine as installed shall be capable of carrying its full rated load within 20 seconds after cranking is initiated with the intake air, room ambient, and starting battery all at a temperature of 32° F. The diesel engine shall be electric starting unless otherwise approved, and the starting battery shall be of sufficient capacity to provide six consecutive cycles of cranking, each cycle to consist of approximately one-half minute of cranking at a speed recommended by manufacturer followed by approximately one minute of battery rest, with the intake air, room ambient, and starting battery at a temperature of 32° F. At the end of the sixth cycle of cranking, the battery voltage while cranking the engine, shall be not less than 50 percent of nominal voltage. The diesel-engine-driven generator set shall lubricate and operate satisfactorily when permanently inclined to an angle of 22½ degrees athwartship and 10 degrees fore and aft, and shall be arranged so that it will not spill oil under a vessel roll of 30 degrees each side of the vertical. Units depending on forced lubrication shall be provided with an audible alarm device to sound on loss of oil pressure while running.

(b) Hydraulic means of starting the diesel engine will be considered equally acceptable to the electric means described in paragraph (a) of this section provided all the following conditions are met:

(1) The hydraulic cranking device shall be a self-contained system which will provide the required cranking forces and engine starting RPM as recommended by engine manufacturer.

(2) Electrically operated means shall automatically provide and maintain the stored hydraulic pressure within the predetermined pressure limits.

(3) The means of automatically maintaining the hydraulic system within the predetermined pressure limits shall be energized from the final emergency bus.

(4) Means shall be provided to manually recharge the hydraulic system.

(5) Charging of the hydraulic cranking system shall not create an absence of hydraulic power for engine starting at any time.

(6) The capacity of the hydraulic cranking system shall provide not less than 6 cranking cycles. Each cranking cycle shall provide the necessary number of revolutions at the required RPM to permit the diesel engine to meet the requirements of carrying its full rated load within twenty seconds after cranking is initiated with intake air, room ambient temperature and hydraulic cranking system at 32° F.

(7) Capacity of the hydraulic cranking system sufficient for three starts under conditions of subparagraph (6) of this paragraph shall be held in reserve and arranged so that the operation of a single control by one person will isolate the discharged or initially used part of the system and permit the reserve capacity to be employed.

Subpart 112.55—Storage Battery Installation

§ 112.55–1 General requirements.

(a) Storage batteries for emergency lighting and power systems, including starting batteries for emergency diesel-engine driven generator sets, shall be of a design and construction proven successful in merchant marine service, and capable of withstanding the roll and pitch of a vessel and exposure to salt air. Positive plates of lead-acid batteries shall be at least 0.25 inch thick, and the specific gravity of the electrolyte when fully charged shall be 1.210 to 1.220, both inclusive, at 25° C., except that thin positive plate construction (0.125 inch thick minimum) may be used for engine cranking batteries. The fully charged specific gravity of the electrolyte of lead-acid engine cranking batteries shall not exceed 1.260 at 25° C. for high watering space type batteries or 1.285 at 25° C. for normal watering space type batteries.

§ 112.55–5 Emergency lighting loads.

(a) When supplying emergency lighting loads, the storage battery initial voltage shall not exceed the standard system voltage by more than 5 percent.

§ 112.55–10 Storage battery requirements.

(a) Storage battery installations for emergency lighting and power, including starting batteries for emergency diesel-engine driven generator sets, shall include the necessary apparatus automatically to maintain the battery in a fully charged condition. At all times when the ship's service source of supply is available, the battery shall be furnished a continuous trickle charge, except that after a battery discharge, the battery shall be automatically charged at a higher rate until the battery voltage increases to a predetermined point. Charging operations shall not create an absence of battery power at any time. Instruments to show the rate of charge shall be provided.

§ 112.55–15 Capacity of storage battery.

(a) The capacity of a storage battery shall be ample to close each watertight door three times and to open each watertight door two times, and to carry the remaining emergency loads continuously for the duration of time required by § 112.05–5(a), at the end of which time the potential of the storage battery shall be not less than 87.5 percent of standard system voltage. The nominal potential of a lead-acid storage battery will be taken as 2.0 volts per cell; the nominal potential of nickel-alkaline storage batteries will be taken as from 1.2 to 1.4 volts per cell.

§ 112.55–20 Diesel engine cranking batteries.

(a) Batteries used for starting emergency diesel engine generator sets shall be either the lead-acid or nickel-cadmium type.

Subpart 112.90—Emergency Lighting and Power Systems for Vessels Contracted for Prior to November 19, 1952

§ 112.90–1 General.

(a) Existing arrangements, materials, and facilities previously approved, but not meeting the applicable specifications or requirements set forth in Subparts 112.05 through 112.55, may be continued in service so long as they are maintained in good condition to the satisfaction of the Officer in Charge, Marine Inspection. Minor repairs and minor alterations may be made to the same standards as the original installation: *Provided*, That, in no case, will a greater departure from the standards of Subparts 112.05 through 112.55 be permitted than presently exist.

(b) All new installations or major replacements shall meet the applicable specifications or requirements for new vessels.

§ 112.90–5 Emergency lighting system for ocean and coastwise passenger vessels contracted for prior to November 19, 1952.

(a) The emergency lighting system for ocean and coastwise passenger vessels

contracted for prior to November 19, 1952, shall be in accordance with this section.

(b) Provision shall be made on all passenger vessels for an electric or other system of lighting, sufficient for all requirements of safety, in the different parts of the ship. There shall be a self-contained source capable of supplying, when necessary, this safety lighting system, and placed in the upper parts of the ship above the margin line.

(c) The exit from every main compartment occupied by passengers or crew shall be continuously lighted by an emergency lamp. The power for these emergency lamps shall be so arranged that they will be supplied from the independent installations referred to in paragraph (b) of this section in the event of failure of the main generating plant.

(d) On all passenger vessels contracted for on and after July 1, 1935, or where existing emergency installations operated by internal combustion engines are replaced, the emergency generator shall be driven by a diesel or semi-diesel engine, equipped with means for quick starting. Such emergency equipment shall be located in steel or iron compartments or rooms on the deck above the weather deck and isolated from the passenger and crew quarters. Where existing installations of emergency engines and generators are located in wooden compartments or rooms, such compartments or rooms shall be made fire-resistant by lining same with asbestos board having a thickness of not less than one-quarter inch over which iron or steel sheathing shall be fitted.

(e) Provision shall be made on all passenger vessels, where the boat deck is more than 30 feet above the water line at the lightest seagoing draft, for readily and continuously available illumination from the vessel of lifeboats when along side and in process of, or immediately after, being launched. There shall be a self-contained source capable of supplying, when necessary, this safety lighting system and placed in the upper part of the vessel above the bulkhead deck.

(1) The emergency generating set will ordinarily provide a satisfactory source of illumination, and, where used for this purpose, it shall be of sufficient power to provide for such illumination in addition to other demands made upon the set.

§ 112.90–10 Emergency lighting system for passenger vessels other than ocean and coastwise passenger vessels contracted for prior to November 19, 1952.

(a) The emergency lighting system for passenger vessels other than ocean and coastwise passenger vessels contracted for prior to November 19, 1952, shall be in accordance with this section.

(b) All vessels engaged in the passenger service, which are electrically lighted by dynamos or other electric units, located below the deep-load line of the vessel, shall have on board an emergency electric lighting system located above the deep-load line to light the vessel sufficiently to enable the passengers and crew to find their way to the exits in the event of failure of the main lighting system. The emergency lighting system shall at all times be ready for immediate use, and shall be installed and arranged so that all emergency lights may be switched on from the pilothouse, navigation bridge, or a central station.

(c) On all passenger vessels contracted for on and after July 1, 1935, or where existing emergency installations operated by internal-combustion engines are replaced, the emergency generator shall be driven by a diesel or semi-diesel engine, equipped with means for quick starting. Such emergency equipment shall be located in steel or iron compartments or rooms on the deck above the weather deck and isolated from the passenger and crew quarters. Where existing installations of emergency engines and generators are located in wooden compartments or rooms, such compartments or rooms shall be made fire-resistant by lining same with asbestos board having a thickness of not less than one-quarter inch over which iron or steel sheathing shall be fitted.

(d) Provision shall be made on all passenger vessels, where the boat deck is more than 30 feet above the water line at the lightest seagoing draft, for readily and continuously available illumination from the vessel of lifeboats when alongside and in process of, or immediately after, being launched. There shall be a self-contained source capable of supplying, when necessary, this safety lighting system and placed in the upper part of the vessel above the bulkhead deck.

(1) The emergency generating set will ordinarily provide a satisfactory source of illumination, and, where used for this purpose, it shall be of sufficient power to provide for such illumination in addition to other demands made upon the set.

PART 113—COMMUNICATION AND ALARM SYSTEMS AND EQUIPMENT

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Subpart 113.55—Navigation Lights

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113.55–1 Application.
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113.55–10 Construction of navigation lights.
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Subpart 113.60—Signaling Lights

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Subpart 113.65—Whistle Operators

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Subpart 113.70—Smoke Detector Systems

113.70–1 Application.
113.70–5 General requirements.
113.70–10 Power supply.
113.70–90 Equipment and installations on vessels contracted for prior to November 19, 1952.

AUTHORITY: The provisions of this Part 113 issued under R.S. 4405, as amended, 4462, as amended; 46 U.S.C. 375, 416. Interpret or apply R.S. 4399, as amended, 4400, as amended, 4417, as amended, 4417a, as amended, 4418, as amended, 4421, as amended, 4426, as amended, 4427, as amended, 4433, as amended, 4453, as amended, 4488, as amended, 4491, as amended, sec. 14, 29 Stat. 690, as amended, sec. 10, 35 Stat. 428, as amended, 41 Stat. 305, as amended, sec. 5, 49 Stat. 1384, as amended, secs. 1, 2, 49 Stat. 1544, 1545, as amended, sec. 17, 54 Stat. 166, as amended, sec. 3, 54 Stat. 347, as amended, sec. 3, 70 Stat. 152, sec. 3, 68 Stat. 675; 46 U.S.C. 361, 362, 391, 391a, 392, 399, 404, 405, 411, 435, 481, 489, 366, 395, 363, 369, 367, 526p, 1333, 390b, 50 U.S.C. 198; E.O. 11239, July 31, 1965, 30 F.R. 9671, 3 CFR, 1965 Supp. Treasury Department Orders 120, July 31, 1950, 15 F.R. 6521; 167–14, Nov. 26, 1954, 19 F.R. 8026; 167–20, June 18, 1956, 21 F.R. 4894; CGFR 56–28, July 24, 1956, 21 F.R. 5659; 167–38, Oct. 26, 1959, 24 F.R. 8857.

Subpart 113.01—Application

§ 113.01–1 Vessels subject to requirements.

(a) The provisions of this part shall apply to all vessels except as specifically noted in this part.

Subpart 113.05—General Provisions

§ 113.05–1 Supplementary requirements.

(a) The provisions of this part are supplementary to the general requirements for electrical systems and apparatus contained in this subchapter.

113.05–5 Equipment of an approved type.

(a) Where equipment in this part is required to be of an approved type, such equipment shall be of a type approved by the Commandant.

(b) Specifications for many of the items required to be of an approved type have been promulgated and are contained in Subchapter Q (Specifications) of this chapter. In general, such specifications are of interest only to the manufacturer of specific items of equipment.

§ 113.05–10 Wiring.

(a) Hook-up wire for use within the components of the equipment specified in this part shall be of soft stranded annealed copper of suitable cross section to provide ample and safe current carrying capacity and mechanical strength. Hook-up wire shall be in accordance with MIL–W–76, MIL–W–16878 types B, C, D, E, EE, and FF, or with Subpart 111.60 of this subchapter.

(b) All external wiring and wiring between components shall be in accordance with Subpart 111.60 of this subchapter.

Subpart 113.10—Automatic Fire Detecting and Alarm Systems

§ 113.10–1 Application.

(a) Where an electric fire detecting and alarm system is installed, the provisions of this subpart, with the exception of § 113.10–90, shall apply to all installations contracted for on or after November 19, 1952. Installations contracted for prior to November 19, 1952, shall meet the requirements of § 113.10–90.

(b) For the vessels on which an automatic fire detecting and alarm system is required see Part 76 of Subchapter H (Passenger Vessels) of this chapter.

§ 113.10–5 General requirements.

(a) Fire alarm annunciators, power supply, fire detectors, test stations, and vibrating bells shall be of a type approved by the Commandant. Systems installed on vessels contracted for on or after November 19, 1959, shall meet the requirements of Subpart 161.002 of Subchapter Q (Specifications) of this chapter.

(b) All electric cables installed in conjunction with fire detecting and alarm system shall be either leaded and armored, impervious sheathed and armored or mineral insulated metal sheathed.

(c) Cable runs between the fire alarm annunciator and fire detecting zones shall be as direct as possible, and shall avoid, where possible, staterooms, lockers, and other enclosed spaces where this cable could be damaged by a localized fire or by other causes.

(d) Conductors for several fire detecting zones may be run in a multi-conductor cable, but a conductor shall not be used as a common return from two or more zones.

(e) Connection boxes containing conductors to more than one fire detecting zone shall be of watertight construction and the cable entrances shall be made tight by means of terminal or stuffing tubes.

(f) Connection boxes for fire detector stations, manual alarm stations, test stations, or other boxes containing the conductors of a single fire detecting zone, may be of nonwatertight construction, if installed in a dry location.

§ 113.10–90 Equipment and installations on vessels contracted for prior to November 19, 1952.

(a) Existing arrangements, materials, and facilities previously approved, but not meeting the applicable specifications or requirements set forth in § 113.10–5, may be continued in service so long as they are maintained in good condition to the satisfaction of the Officer in Charge, Marine Inspection. Minor repairs and minor alterations may be made to the same standards as the original installation: *Provided*, That, in no case, will a greater departure from the standards of § 113.10–5 be permitted than presently exist. All new installations or major replacements shall meet the applicable specifications or requirements.

(b) All conductors shall conform to specifications for interior communication cable contained in the marine rules as adopted by the Institute of Electrical and Electronic Engineers as regards construction, size, leading, armoring, protection, support, and details of installation, with the following exceptions:

(1) All conductors shall be lead sheathed to protect against moisture and conductors exposed to mechanical injury shall be leaded and armored.

(2) Lead-sheathed conductors may be used for voltages of 60 volts or less.

(3) In single-wire, closed-circuit systems (series) approved metallic sheathed wire shall be used in connecting thermostats in each thermostat zone, but approved multiconductor cable may be used to connect the several individual zones to the annunciator panel.

Subpart 113.15—Manual Fire Alarm Systems

§ 113.15–1 Application.

(a) Where an electric manual fire alarm system is installed, the provisions of this subpart, with the exception of § 113.15–90, shall apply to all installations contracted for on or after November 19, 1952. Installations contracted for prior to November 19, 1952, shall meet the requirements of § 113.15–90.

(b) For the vessels on which a manual fire alarm system is required, see Part 76 of Subchapter H (Passenger Vessels) of this chapter.

§ 113.15–5 General requirements.

(a) Manual fire alarm annunciator, power supply, manual stations, and vibrating bells shall be of a type approved by the Commandant. Systems installed on vessels contracted for on or after November 19, 1959, shall meet the requirements of Subpart 161.002 of Subchapter Q (Specifications) of this chapter.

(b) All electric cables installed in conjunction with manual fire alarm systems shall be either leaded and armored, impervious sheathed and armored or mineral insulated metal sheathed.

(c) Cable runs between the annunciator and fire alarm zones shall be as direct as possible, and shall avoid, where possible, staterooms, lockers, and other

enclosed spaces where the cable could be damaged by a localized fire or by other causes.

(d) Conductors for several fire alarm zones may be run in a multiconductor cable, but a conductor shall not be used as a common return from two or more zones.

(e) Connection boxes containing conductors to more than one fire alarm zone shall be of watertight construction and the cable entrances shall be made tight by means of terminal or stuffing tubes.

(f) Connection boxes for manual stations, or other boxes containing the conductors of a single fire alarm zone, may be of nonwatertight construction if installed in a dry location.

§ 113.15–90 Equipment and installations on vessels contracted for prior to November 19, 1952.

(a) Existing arrangements, materials, and facilities previously approved, but not meeting the applicable specifications or requirements set forth in § 113.15–5, may be continued in service so long as they are maintained in good condition to the satisfaction of the Officer in Charge, Marine Inspection. Minor repairs and minor alterations may be made to the same standards as the original installation: *Provided*, That, in no case, will a greater departure from the standards of § 113.15–5 be permitted than presently exist. All new installations or major replacements shall meet the applicable specifications or requirements.

(b) All conductors shall conform to specifications for interior communication cable contained in the marine rules as adopted by the American Institute of Electrical Engineers as regards construction, size, leading, armoring, protection, support, and details of installation, with the following exceptions:

(1) All conductors shall be lead sheathed to protect against moisture and conductors exposed to mechanical injury shall be leaded and armored.

(2) Lead-sheathed conductors may be used for voltages of 60 volts or less.

(3) In single-wire, closed-circuit systems (series) approved metallic sheathed wire shall be used in connecting thermostats in each thermostat zone, but approved multiconductor cable may be used to connect the several individual zones to the annunciator panel.

Subpart 113.20—Automatic Sprinkler Systems

§ 113.20–1 Application.

(a) When an automatic sprinkler system is installed, the provisions of this subpart, with the exception of § 113.20–90, shall apply to all installations contracted for on or after November 19, 1952. Installations contracted for prior to November 19, 1952, shall meet the requirements of § 113.20–90.

§ 113.20–5 General requirements.

(a) The general requirements for automatic sprinkler systems are contained in Subpart 76.25 of Subchapter H (Passenger Vessels) of this chapter.

(b) The sprinkler alarm system, including annunciator, power supply, alarm switches, and bells shall be of an approved type.

(c) All electric cable employed in a sprinkler alarm system shall be either leaded and armored, impervious sheathed and armored or mineral insulated metal sheathed.

(d) All connection boxes, alarm switches, pressure switches, or level switches, etc., employed in the system shall be of watertight construction.

§ 113.20–90 Equipment and installations on vessels contracted for prior to November 19, 1952.

(a) Existing arrangements, materials, and facilities previously approved, but not meeting the applicable specifications or requirements set forth in § 113.20–5, may be continued in service so long as they are maintained in good condition to the satisfaction of the Officer in Charge, Marine Inspection. Minor repairs and minor alterations may be made to the same standards as the original installation: *Provided*, That, in no case, will a greater departure from the standards of § 113.20–5 be permitted than presently exist. All new installations or major replacements shall meet the applicable specifications or requirements.

(b) All conductors shall conform to specifications for interior communication cable contained in the marine rules as adopted by the American Institute of Electrical Engineers as regards construction, size, leading, armoring, protection, support, and details of installation, with the following exceptions:

(1) All conductors shall be lead-sheathed to protect against moisture and conductors exposed to mechanical injury shall be leaded and armored.

(2) Lead-sheathed conductors may be used for voltages of 60 volts or less.

(3) In single-wire, closed-circuit systems (series) approved metallic sheathed wire shall be used in connecting thermostats in each thermostat zone, but approved multi-conductor cable may be used to connect the several individual zones to the annunciator panel.

(c) Where a motor-driven sprinkler pump is installed, it shall be capable of being operated from the emergency electrical circuit in case of failure of the main power.

Subpart 113.25—General Alarm Systems

§ 113.25–1 Application.

(a) The provisions of this subpart, with the exception of §§ 113.25–25 and 113.25–90, shall apply to all manned vessels of over 100 gross tons, except barges, scows, and similar vessels, contracted for on or after November 19, 1952.

(b) The provisions of § 113.25–25 shall apply to all manned ocean and coastwise barges of over 100 gross tons, where the crew is divided into watches for the purpose of steering, contracted for on or after November 19, 1952.

(c) The provisions of § 113.25–30 shall apply to all barges of 300 gross tons and over contracted for on or after November 19, 1958, with sleeping accommodations for more than 6 persons.

(d) The provisions of § 113.25–90 shall apply to all manned vessels of over 100 gross tons, except barges, scows, and similar vessels, contracted for prior to November 19, 1952.

§ 113.25–5 Operation.

(a) The general alarm system shall consist of electric vibrating bells located throughout passengers' and crew's quarters, machinery spaces, and work spaces, and so located as to warn all occupants in an emergency.

(b) The general alarm system shall be operated by means of a manually operated contact maker located in the wheelhouse. On tankships the general alarm system shall also be controlled by means of a manually operated contact maker located in an accessible location in the deck officers' quarters and in the engineroom. On vessels other than tank vessels one additional contact maker may be installed in an accessible location other than the wheelhouse. Except for those installed in the wheelhouse, all contact makers shall be protected against tampering by means of an enclosure provided with a breakable transparent window.

(c) On vessels on which an emergency squad is organized and on vessels having a manual fire alarm system, a second manually operated contact maker shall be located in the wheelhouse and so connected as to operate only the general alarm bells located in crew's quarters and machinery spaces.

§ 113.25–10 General requirements.

(a) *Power supply.* (1) The power supply for the general alarm system shall be a storage battery located above the bulkhead deck or above the freeboard deck, whichever is the higher, and in a protected area outside the machinery casing.

(2) The nominal potential of the general alarm system shall be not less than 6 volts and not more than 120 volts.

(3) The general alarm system supply shall be one of the following types:

(i) One storage battery, used for no other purpose, in combination with an automatic charging panel that will maintain the battery in a fully charged condition at all times except immediately following a discharge. The storage battery shall have sufficient capacity to supply the general alarm system continuously for a period of at least 8 hours without being recharged;

(ii) Duplicate storage batteries, used for no other purpose, and so connected, in combination with a manual two-position transfer switch (having no OFF position), that one battery will be charged while the other battery is available for furnishing power to the system. Each of the two storage batteries shall have sufficient capacity to supply the general alarm system continuously for a period of at least 4 hours without being recharged;

(iii) A circuit connected to the temporary emergency bus of an emergency

switchboard as provided for by § 112.15–1 (i) of this subchapter; or

(iv) A circuit from an interior communication switchboard, the interior communication switchboard being supplied by duplicate storage batteries so connected, in combination with a manual two-position transfer switch (having no OFF position), that one battery will be charged while the other battery is available for furnishing power to the switchboard. The interior communication batteries shall each be of sufficient capacity to supply without recharging the general alarm system continuously for a period of 4 hours and to supply all other connected loads at maximum expected demand for a period of at least 8 hours.

(4) When the general alarm system is the only load supplied by the general alarm system battery or batteries, the battery or batteries shall be protected against overcurrent by enclosed fused switches or circuit breakers, having provisions for locking to prevent either unauthorized operation of the switch or circuit breaker or unauthorized tampering with the fuses. The fused switch or circuit breaker shall be located outside of, but adjacent to, the battery room or battery locker, and the capacity of the fuses or circuit breaker shall be not less than 200 percent of the connected load.

(5) When the general alarm system is supplied from an emergency or interior communication switchboard, the fused switch or circuit breaker supplying the general alarm system shall have provisions for locking to prevent either unauthorized operation of the switch or circuit breaker or unauthorized tampering with the fuses.

(b) *Distribution of general alarm system feeders and branch circuits.* (1) A feeder distribution panel shall be provided to divide the system into the required number or zone feeders. The distribution panel shall afford overcurrent protection for each zone feeder, but no disconnect switches shall be provided. The distribution panel shall be located above the bulkhead deck or above the freeboard deck, whichever is the higher, and outside the machinery casing.

(2) At least one feeder shall be provided for each vertical fire zone in which general alarm bells are located.

(3) One or more branch circuit distribution panels shall be provided for each zone feeder with at least one fused branch circuit for each deck level. The distribution panel shall be located above the bulkhead deck or above the freeboard deck, whichever is the higher, in the zone served, and no disconnect switches shall be provided for the branch circuits.

(4) No more than five general alarm bells shall be connected to one branch circuit, and a branch circuit shall not supply bells on more than one deck level.

(5) On vessels not divided into fire zones by main vertical fire bulkheads, the vessel shall be divided into vertical zones not exceeding 150 feet in length and a general alarm feeder provided for each such zone in which general alarm bells are required.

(6) On vessels where accommodation spaces are located only at the extremities of the vessels, other arrangements of feeders and branch circuits will be considered.

(c) *Location of general alarm bells.* (1) General alarm bells shall be so distributed throughout passengers' and crew's quarters in such number and in such a manner as to obtain in each room with the door closed either:

(i) A sound level of not less than 75 decibels; or

(ii) A sound level of 6 decibels above the ground noise level existing when the vessel is underway in moderate weather, whichever is the higher.

(2) General alarm bells shall be so distributed throughout public spaces, work spaces, and machinery spaces in such number and in such a manner as to warn all occupants in an emergency.

§ 113.25–15 Detail requirements.

(a) *Storage batteries.* (1) Storage batteries shall comply with the requirements of Subpart 112.55 of this subchapter.

(2) At the end of the discharge period specified by § 113.25–10(a), the battery potential shall be not less than 80 percent of nominal potential under load.

(b) *Contact maker.* (1) The contact maker shall be a normally open circuit spring-return-to-normal type of enclosed watertight switch.

(2) The contact maker shall be designed to close its contacts when a substantial operating handle is rotated in a clockwise direction through an arc of approximately 60 degrees.

(3) The switch handle shall have means provided for locking in the ON position by means of a spring loaded locking pin.

(4) The OFF and ON positions of the operating handle shall be indicated by means of prominently raised letters.

(5) The contact maker shall be provided with mechanical stops to limit the rotation of the operating handle.

(6) The contact maker shall have an inductive load rating not less than the connected load. On large vessels, consideration will be given to the use of auxiliary devices to interrupt the load current.

(c) *Vibrating bells.* (1) Vibrating bells installed in conjunction with a general alarm system shall be of a type approved by the Commandant.

(2) General alarm system vibrating bells shall produce a signal of a tone distinct from that of any other bell signals on the vessel.

(d) *Electric cable and distribution fittings.* (1) All cable installed in conjunction with general alarm systems shall be either leaded and armored, impervious sheathed and armored or mineral insulated metal sheathed.

(2) Cable entrances to all bells and distribution fittings shall be made watertight by means of terminal or stuffing tubes.

(3) Distribution panels shall be of watertight construction and shall be of a type requiring the use of a tool to gain entrance to the box.

(4) All fuses employed in a general alarm system shall be 250-volt National Electric Code standard, non-renewable cartridge fuses bearing the approval label of a recognized testing organization.

(5) General alarm system fuse capacities shall be selected to obtain as wide a differential as possible between branch circuit fuses and feeder fuses. The capacity of a feeder fuse shall be approximately 200 percent of the load supplied, and the capacity of a branch circuit fuse shall not exceed 50 percent of the capacity of the feeder fuse.

§ 113.25–20 Marking of equipment.

(a) Each general alarm system fused switch and distribution panel shall be provided with a permanent nameplate on the outside of the door describing its function. The rating of fuses shall also be indicated for fused switches.

(b) The general alarm contact maker shall be marked with lettering on a corrosion-resistant plate or with a sign in red letters on a suitable background "GENERAL ALARM."

(c) A contact maker to operate only the general alarm bells in crew quarters, machinery and work spaces shall be marked as described in paragraph (b) of this section, except with the words "CREW ALARM."

(d) General alarm bells shall be marked in not less than ½-inch red letters "GENERAL ALARM—WHEN BELL RINGS GO TO YOUR STATION."

(e) Each general alarm system distribution panel shall be provided with a directory attached to the inside of the cover giving the designation of each circuit, the area supplied by each circuit, and the rating of all circuit fuses.

CROSS REFERENCES: See also §§ 78.47–5 and 78.47–7 of Subchapter H (Passenger Vessels) and §§ 97.37–5 and 97.37–7 of Subchapter I (Cargo and Miscellaneous Vessels) of this chapter.

§ 113.25–25 General alarm system for manned ocean and coastwise barges.

(a) Each manned ocean and coastwise barge of over 100 gross tons, where the crew is divided into watches for the purpose of steering the vessel, shall be provided with a suitable alarm bell installation.

§ 113.25–30 General alarm system for barges of 300 gross tons and over with sleeping accommodations for more than 6 persons.

(a) Barges of 300 gross tons and over with sleeping accommodations for more than 6 persons shall be provided with a suitable alarm bell installation.

§ 113.25–90 General alarm system for existing vessels.

(a) All vessels of over 100 gross tons the construction of which was begun on or after September 1, 1943, but prior to November 19, 1952, shall have all sleeping accommodations, public spaces, and

machinery spaces equipped with a sufficient number of alarm bells so located as to warn all occupants. The system shall operate from a continuous source of electric energy capable of supplying the system for a period of at least 8 hours without being dependent upon the main, auxiliary or emergency generating plants. Each bell shall produce a signal of a tone distinct from that of other bell signals in the vicinity and shall be independently fused with each of these fuses located above the bulkhead deck. The bells shall be controlled by a manually operated contact maker located in the pilothouse, or, if specific approval is given by the Commandant, in the fire control station. The characteristics of the contact maker shall be such that it possesses:

(1) Positive contact;

(2) Watertightness (when located in open spaces subject to weather);

(3) Means whereby its electrically open or closed position can be determined by sense of touch;

(4) Means to effect a make-and-break circuit for signalling; and

(5) Self-maintaining contacts.

(b) All vessels of over 100 gross tons the construction of which was begun prior to September 1, 1943, shall have all sleeping accommodations equipped with a sufficient number of alarm bells so located as to warn all the occupants. The alarm bells, if electric, shall be operated from an open switch from the pilothouse or bridge. The bells shall be of such size, character, and construction as to provide an alarm throughout the spaces for which they are provided.

(c) Existing arrangements, materials, and equipment previously approved shall be considered satisfactory so long as they are maintained in good condition to the satisfaction of the Officer in Charge, Marine Inspection. Minor repairs and minor alterations may be made to the same standard as the original installation. All new installations or major replacements shall meet the applicable specifications or requirements for new vessels.

Subpart 113.30—Sound Powered Telephone and Voice Tube Systems

§ 113.30–1 Application.

(a) The provisions of this subpart, with the exception of § 113.30–90, shall apply to all self-propelled vessels contracted for on or after November 19, 1952. Vessels contracted for prior to November 19, 1952, shall meet the requirements of § 113.30–90.

§ 113.30–5 General requirements.

(a) Vessels shall be provided with an efficient means of communication between each of the following:

(1) Wheelhouse;

(2) Engine room;

(3) Steering gear room, if located outside of engine room; and

(4) After steering station, if required.

(b) Vessels equipped with a gyro-compass system shall be provided with an efficient means of communication between the master gyro-compass and the wheelhouse repeater compass. Whenever the master gyro-compass is located within any compartment adjoining or opening into the wheelhouse, the master gyro-compass shall be considered as being located in the wheelhouse and no communication therewith is required.

(c) Vessels equipped with a radar plan position indicator installation remotely located from the wheelhouse shall be provided with an efficient means of communication between the wheelhouse and the radar plan position indicator.

(d) Where emergency squad equipment is stowed in lockers or spaces remote from the wheelhouse, an efficient means of communication shall be provided between the wheelhouse and the emergency squad equipment stowage space or spaces.

(e) Communication to radio and radio direction-finder shall comply with the requirements of this paragraph. The term "radio installation" shall be construed to mean either the radiotelegraph installation or, where only a radiotelephone is installed, the radiotelephone installation.

(1) Vessels equipped with a radio installation shall be provided with an efficient means of communication between the radio room and the wheel house and one other place, if any, from which the vessel may be navigated under normal conditions, as opposed to other such places established solely for emergency functions, or places used solely for docking or maneuvering, or places used occasionally while navigating the vessel in close quarters. As used in this paragraph only a location which includes the necessary apparatus to steer the vessel, give engine orders, and control the whistle will be considered a place from which the vessel may be navigated.

(i) Where the operating position of the emergency radio installation is not located in the compartment normally used for operating the main radio installation, an efficient means of communication shall be provided between the emergency radio room and the wheel house and one other place, if any, from which the vessel may be navigated under normal conditions, as opposed to other such places established solely for emergency functions, or places used solely for docking or maneuvering, or places used occasionally while navigating the vessel in close quarters.

(2) Vessels equipped with radio direction-finding apparatus shall be provided with an efficient means of communication between the wheelhouse and the direction-finding apparatus.

(i) Whenever the direction-finder receiver is located on the navigating bridge of a ship or within any compartment adjoining or opening onto the wheelhouse of a ship, the direction-finding apparatus shall be considered as being located in the wheelhouse, and no communication is required.

(3) The communication systems required by this paragraph shall be independent of any other system on the ship, and the location of the termination of these systems shall be subject to approval by the Federal Communications Commission.

(f) Vessels equipped with smoke detecting systems contracted for on or after January 1, 1962, where detecting cabinets are not located in the pilothouse shall be provided with an efficient means of direct communication between the pilothouse and the stations where the detecting cabinets are located.

(g) An efficient means of communication shall be provided between the wheelhouse and the bow or forward lookout station. This communication need not be by means of sound powered telephone or voice tube if other suitable means is provided or if the vessel configuration is such that direct voice communication between the wheelhouse and bow or forward lookout station is effective. When a sound powered telephone is installed, the requirements of § 113.30–20(b) are applicable.

§ 113.30–10 Voice tubes, general requirements.

(a) Voice tubes may be employed to comply with the requirements of this subpart where the required length of voice tube as installed will not exceed 125 feet.

(b) Where the length of voice tube as installed is not over 75 feet, the tube used shall be at least 2 inches outside diameter.

(c) Where the length of voice tube as installed is over 75 feet and not over 125 feet, the tube shall be at least 2½ inches outside diameter.

(d) Sound powered telephone equipment may be installed in all cases where voice tube communication is permitted.

§ 113.30–15 Voice tubes, detail requirements.

(a) Voice tubes and voice tube fittings shall be constructed of brass or other corrosion-resistant material having a wall thickness of approximately 0.042 inch.

(b) Voice tubing shall be run as direct as possible, and the cross-section of the tube shall be constant throughout the run. Any constriction in the tube such as a dent; reducer coupling, sharp elbow, T connection, or any flat surface shall be avoided. Flexible tubes or bends shall be used in place of fittings wherever possible. Joints in tubing shall be protected by a close fitting sleeve and the joint soldered or filled with white lead.

(c) Voice tubes shall be supported at least every 8 feet on straight runs and at bends as required.

(d) Voice tubes shall be protected where liable to injury and shall not be run in bunkers, cargo spaces, or through machinery spaces unless unavoidable.

(e) Voice tubes shall be provided with drain plugs at the bottom of each vertical run and at all other places where water can collect.

(f) Each voice tube shall be terminated at each end by a suitable mouthpiece with a whistle indicator. Watertight mouthpieces shall be used in locations exposed to the weather.

(g) All voice tubes shall be provided with designating nameplates.

§ 113.30–20 Sound powered telephone system, general requirements.

(a) Where a voice tube installation would require a length of the tube exceeding 125 feet or where for other reasons efficient communication cannot be obtained by a voice tube installation, approved sound powered telephone equipment shall be installed as the means of communication required by this subpart.

(b) The telephone stations listed in § 113.30–5 (a) through (d), (f), and (g) may be installed on the same circuit. However, when included on the same circuit with other required stations, the bow or forward lookout telephone must be provided with a wheelhouse cut-out switch if the telephone is located in the weather. Other stations which are desirable for the operation of the vessel, such as captain's and chief engineer's office and stateroom, emergency power room, CO_2 control room, fire pumproom, etc., will be considered for inclusion on this circuit.

(c) Sound powered telephone systems may, in all cases, be installed in lieu of voice tube systems.

(d) Except as provided in paragraph (b) of this section, telephone stations not specifically required by this subpart which are located in the weather shall not be included on a telephone circuit which includes any of the required telephone stations.

(e) Jack boxes or headsets shall not be utilized on a telephone installation that includes any of the stations required by this subpart.

§ 113.30–25 Sound powered telephone system, detail requirements.

(a) Sound powered telephone equipment used on a telephone circuit that includes any of the stations required by this subpart shall be of a type approved by the Commandant.

(b) Sound powered telephone stations installed in locations exposed to the weather shall be of watertight construction, and the audible signal shall be mounted external to the station enclosure.

(c) Sound powered telephone stations installed in wheelhouse or machinery spaces shall be of at least drip-proof construction.

(d) In noisy locations, a telephone booth or other suitable auxiliary equipment shall be provided if necessary in order that a telephone conversation can be carried on while the vessel is being navigated.

(e) In noisy locations where the magneto-operated telephone station sound signal cannot be heard throughout the space, the sound signal shall be supplemented by an additional sound signal energized from the vessel's electrical system and magneto actuated. This supplementary sound signal shall not be combined with any other signal or alarm system, such as an engineers' signal and alarm panel.

(f) When two or more telephone stations are located in close proximity to each other, a suitable means shall be provided to indicate the station called.

(g) The sound powered telephone talking circuit shall be electrically independent of the calling circuits. A short circuit, open circuit, or ground on either side of the calling circuit shall not affect the talking circuit in any way. All circuits shall be insulated from ground.

(h) Sound powered telephone circuits shall be run in leaded and armored, impervious sheathed and armored or mineral-insulated metal sheathed cable. All connection boxes employed shall be watertight.

(i) Telephone cables shall be run as close to the fore and aft centerline of the vessel as is practicable and through runs of cable should avoid such spaces as machinery room and galleys.

§ 113.30–90 Sound powered telephone and voice tube systems for existing vessels.

(a) Vessels contracted for prior to November 19, 1952, shall meet the requirements contained in this section.

(b) Except as otherwise required by paragraph (d) of this section, existing arrangements, materials, and facilities previously approved will be considered satisfactory so long as they are maintained in good condition to the satisfaction of the Officer in Charge, Marine Inspection. Minor repairs and minor alterations may be made to the same standard as the original installation.

(c) All new installations or major replacements shall meet the applicable specifications or requirements for new vessels.

Subpart 113.35—Engine Order Telegraph Systems

§ 113.35–1 Application.

(a) The provisions of this subpart, with the exception of § 113.35–90, shall apply to all self-propelled vessels contracted for on or after November 19, 1952. Installations contracted for prior to November 19, 1952, shall meet the requirements of § 113.35–90.

§ 113.35–5 General requirements.

(a) All vessels, except as otherwise provided for in this section, shall have installed an efficient means for transmitting engine orders from the wheelhouse to the engine room and of transmitting acknowledgment of engine orders from the engine room to the wheelhouse.

(1) On vessels with more than one propulsion engine, this efficient means of transmitting engine orders shall be provided for each engine.

(2) On double-ended vessels with two wheelhouses, this efficient means of transmitting engine orders shall be provided between the engine room and each wheelhouse.

(3) On vessels provided with a means of steering from the top of the wheelhouse as well as from the wheelhouse, this efficient means of transmitting engine orders shall also be provided between the engine room and the top of the wheelhouse.

(b) The efficient means of transmitting engine orders may be of the engine gong and sound tube type, the mechanical engine order telegraph type, the electric engine order telegraph type, or other types as may be approved.

(c) Small vessels on which the propulsion plant is controlled entirely from the wheelhouse with no means of normal engine control from the engine room, need not be provided with an engine order telegraph system between the wheelhouse and the engine room.

§ 113.35–10 Engine gong systems, general requirements.

(a) An engine gong system shall consist of pull handles located in the wheelhouse mechanically connected by wires and chains to gongs located in the engine room.

(1) A sound tube of proper size shall be run between the wheelhouse and the engine room and so arranged as to return the sound of the gong signals to the wheelhouse.

(2) A speaking tube or other device for the purpose of conversation between the wheelhouse and the engine room shall also be provided.

(b) The sound tube and the speaking tube shall comply with the requirements of § 113.30–15 except that the sound tube shall be terminated by a flared sounder in lieu of whistle mouthpieces and the sound tube size shall be not less than 2½ inches outside diameter.

(c) The engine room gong and the termination of the sound tube and the speaking tube in the engine room shall be at the engine control station.

(d) The gong pull installation shall comply with the applicable requirements of § 113.35–25.

§ 113.35–15 Engine gong systems, application.

(a) Engine gong systems shall not be employed on vessels where the length of sound tube as installed will exceed 40 feet.

§ 113.35–20 Mechanical engine order telegraph systems, general requirements.

(a) Mechanical engine order telegraph systems shall consist of transmitters and indicators mechanically connected to each other by means of chains and wires.

(b) Transmitters and indicators shall be provided with dials divided into sectors or divisions with the various engine orders engraved thereon.

(c) Rotation of the transmitter handle and its associated pointer shall drive the indicator pointer in synchronism. The indicator pointer, always having the same angular position as the transmitter handle and its associated pointer, shall point to the order corresponding to the order on the transmitter.

(d) The engine room indicator shall be equipped with a reply handle and associated pointer driving a reply pointer in the wheelhouse transmitter for acknowledgement of orders.

(e) Each transmitter and each indicator shall be provided with an audible signal device to indicate, in the case of an indicator, the receipt of an order and, in the case of a transmitter, the acknowledgement of an order. The audible

signal device shall not be dependent upon any source of power for operation other than that of the movement of the transmitter or indicator handle.

(f) The dials of transmitter instruments shall be illuminated in such a manner as not to interfere with navigating the vessel at night.

(g) Transmitter and indicator operating handles shall be of substantial size so that engine orders may be determined from a distance.

§ 113.35–25 Mechanical engine order telegraph systems, detail requirements.

(a) Telegraph wire shall be No. 10 Stubs Gage (0.134 inch diameter) soft brass wire and shall be stretched approximately 20 percent before installation.

(b) Pulleys shall be provided wherever a bend in the run of the telegraph wire is made, and at each pulley sheave a length of brass telegraph chain shall be employed.

(c) Pulleys shall be in line with the wire and chain.

(d) Turnbuckles shall be provided in each lead at each instrument to adjust the handles and pointers to the central position of the order, and shall be provided at other locations throughout the system as necessary to take up slack in the lead wires and to center the chains at the pulleys.

(e) Where telegraph leads pass through watertight decks or bulkheads, stuffing tubes shall be employed.

(f) On long horizontal runs, the telegraph wire shall be supported on roller bearers at approximately every 5 feet of run. When telegraph leads are run behind sheathing or when subject to mechanical damage, the leads shall be run "in pipe."

(g) All fittings used in telegraph installations shall be constructed of brass, bronze, or other corrosion-resistant materials.

(h) Positive locking devices, such as keys, shall be used in securing handles and similar parts to their associated shafts to ensure continuous operation of the shaft in response to movement of the handle.

(i) Transmitter dials shall be arranged with the "STOP" order at the top vertical position of the operating handle. On ahead orders the operating handle shall be moved toward the bow of the vessel and on astern orders the operating handle shall be moved toward the stern of the vessel.

(j) Indicator dials shall be arranged as specified for transmitter dials except that the "STOP" order shall be at the bottom vertical position of the reply handle.

(l) Indicator dials on double-ended vessels shall not be marked with the designations "AHEAD" and "ASTERN," but the reply handle and indicator arrow shall point in the direction in which it is desired that the engine operate.

§ 113.35–30 Mechanical engine order telegraph systems, operation.

(a) Where more than one transmitter, located in the wheelhouse, the wings of the navigating bridge, and/or the top of the wheelhouse, operate a common indicator in the engine room, all the transmitters shall be mechanically interlocked and operate in synchronism. The method of mechanical interlocking shall be such that a failure of the transmission wire or chain at any transmitter located topside will not interrupt or disable other topside transmitters.

§ 113.35–35 Mechanical engine order telegraph systems, application.

(a) Mechanical engine order telegraph systems may be installed on all vessels to provide the communication required by this subpart where the length of cables or other mechanical limitations will not prevent the efficient operation of the system.

§ 113.35–40 Electric engine order telegraph systems, general requirements.

(a) Electric engine order telegraph systems shall consist of transmitters and indicators electrically connected to each other.

(b) Transmitters and indicators shall be provided with dials divided into sectors or divisions with the various engine orders engraved thereon.

(c) Rotation of the transmitter handle and its associated pointer shall drive the indicator pointer in synchronism. The indicator pointer, always having the same angular position as the transmitter handle, shall point to the order corresponding to the order on the transmitter.

(d) For acknowledgment of orders, the engine room indicator shall be equipped with a handle and generator actuating a motor and pointer on the transmitter, similar to the facilities provided for transmitting orders.

(e) Audible signals associated with the system shall consist of a vibrating bell at each instrument. The vibrating bell at both transmitter and indicator shall ring continuously at all times when the transmitter arrow and the reply arrow do not point to the same order.

(f) The dials of transmitter instruments shall be illuminated in such a manner as not to interfere with navigating the vessel at night.

(g) Transmitter and indicator operating handles shall be of substantial size so that the engine order may be determined from a distance.

§ 113.35–45 Electric engine order telegraph systems, detail requirements.

(a) Telegraph instruments shall form watertight enclosures for the electrical components.

(b) Materials used in the construction of telegraph instruments shall be corrosion-resistant.

(c) Transmitter dials shall be in accordance with § 113.35–25 (i). Indicator dials shall be in accordance with § 113.35–25 (j) except that the "STOP" order may be at the bottom or top vertical position of the reply handle to suit bulkhead or pedestal mounted instruments, respectively.

(d) Electric cable used in conjunction with electric telegraphs shall be leaded and armored, impervious sheathed and armored or mineral-insulated metal sheathed and all connection boxes shall be of watertight construction.

(e) Each system shall be provided with an alarm device which automatically sounds audibly and indicates visually in the event of loss of potential to the system.

(1) This alarm device shall be located in the wheelhouse.

(2) Means shall be provided to silence the audible signal.

(3) Where the supervisory power supply is a dry cell battery or some other low capacity source, there shall be no electric drain on the supervisory power supply after the audible signal has been silenced; the visible indication may be extinguished to effect this. Upon reestablishment of potential to the telegraph system, the audible signal shall sound again until the alarm circuit is returned to normal unless restoration of this alarm circuit is effected automatically.

§ 113.35–50 Electric engine order telegraph system, operation.

(a) Where more than one transmitter, located in the wheelhouse, the wings of the navigating bridge, and/or the top of the wheelhouse, operate a common indicator in the engine room, either the transmitters shall operate in synchronism in accordance with paragraph (b) of this section, or the transmitters shall operate under the control of a transmitter transfer control in accordance with paragraph (c) of this section.

(b) All transmitter handles and pointers and all reply pointers shall operate in synchronism. Where the transmitters are mechanically interlocked to effect synchronous operation, the requirements of § 113.35–30(a) shall be met.

(c) All transmitters shall operate under the control of a transmitter transfer control so that movement of any one transmitter handle automatically connects that instrument electrically to the engine room indicator and simultaneously disconnects electrically all other transmitters. The reply pointers of all transmitters shall operate in synchronism at all times.

§ 113.35–55 Electric engine order telegraph systems, application.

(a) Electric engine order telegraph systems may be installed on all vessels to provide the communication required by this subpart, except that passenger vessels of 20,000 gross tons or over equipped with an electric engine order telegraph system shall be provided with a stand-by system, either electrical or mechanical.

§ 113.35–90 Engine order telegraph systems for existing vessels.

(a) The engine order telegraph installations on vessels contracted for prior to November 19, 1952, shall meet the requirements in this section.

(b) Existing arrangements, materials, and facilities previously approved will be considered satisfactory so long as they are maintained in good condition to the satisfaction of the Officer in Charge, Marine Inspection. Minor repairs and minor alterations may be made to the

same standard as the original installation.

(c) All new installations or major replacements shall meet the applicable specifications or requirements for new vessels.

Subpart 113.40—Rudder Angle Indicator Systems

§ 113.40–1 Application.

(a) The provisions of this subpart, with the exception of § 113.40–90 shall apply to all self-propelled vessels contracted for on or after November 19, 1952. Vessels contracted for prior to November 19, 1952, shall meet the requirements of § 113.40–90.

§ 113.40–5 General requirements.

(a) The exact position of the rudder, if power operated, shall be indicated at the principal steering station. When non-follow-up steering control is installed at the after steering station, a separate rudder angle indicator system shall be installed for that station. See Part 57 of Subchapter F (Marine Engineering) of this chapter.

§ 113.40–10 Detail requirements.

(a) The rudder angle indicator system shall consist of a transmitter located at the rudder head and actuated by movement of the rudder, the angular movements of the rudder being transmitted to a remote indicator(s).

(b) The indicator instrument shall consist of a fixed dial with angular positions of the rudder right and left of an amidship position indicated thereon. Indications of rudder angle shall be by means of a moving pointer.

(1) The movement of the indicator pointer shall be consistent with the movement of the steering wheel or control.

(c) The indicator(s) shall be located in direct line of vision of the helmsman and shall be provided with dial illumination in such a manner as not to interfere with navigating the vessel at night.

(d) The method of transmitting rudder movement between the transmitter and the indicator(s) may be either by self-synchronous generator and motor(s), by mechanical telegraphs, or by other equivalent means.

(e) The electric rudder angle indicator system shall comply with the applicable requirements of §§ 113.35–40 and 113.35–45 (a) to (d), inclusive.

(f) Mechanical methods of transmitting rudder angles shall be in accordance with approved installation drawings submitted for each installation.

§ 113.40–90 Rudder angle indicator systems for existing vessels.

(a) Rudder angle indicator systems on vessels contracted for prior to November 19, 1952, shall meet the requirements in this section.

(b) Existing arrangements, materials, and facilities previously approved will be considered satisfactory so long as they are maintained in good condition to the satisfaction of the Officer in Charge, Marine Inspection. Minor repairs and minor alterations may be made to the same standard as the original installation.

(c) All new installations or major replacements shall meet the applicable specifications or requirements for new vessels.

Subpart 113.45—Refrigerated Spaces Alarm Systems

§ 113.45–1 Application.

(a) The provisions of this subpart, with the exception of § 113.45–90, shall apply to all vessels contracted for on or after November 19, 1952. The provisions of § 113.45–90 shall apply to all vessels contracted for prior to November 19, 1952.

§ 113.45–5 General requirements.

(a) Each refrigerated space accessible to ship's personnel during a voyage and which can be so locked from the outside that it cannot be opened from the inside, shall be fitted with an alarm system operated from within each refrigerated space.

(b) The alarm system may be either a mechanical pull operating a jingle bell or an electrical push button operating a vibrating bell or other audible device.

(c) The mechanical pull or electrical push button shall be located at the exit from the refrigerated compartment.

(d) The audible signal shall be located where a person is regularly employed.

(e) Where a common audible signal is provided for more than one lockable refrigerated compartment, an annunciator shall be provided to locate the compartment from which the signal was initiated.

§ 113.45–90 Refrigerated spaces alarm systems on existing vessels.

(a) Refrigerated spaces alarm systems on vessels contracted for prior to November 19, 1952, shall meet the requirements in this section.

(b) Existing arrangements, materials, and facilities previously approved will be considered satisfactory so long as they are maintained in good condition to the satisfaction of the Officer in Charge, Marine Inspection. Minor repairs and minor alterations may be made to the same standard as the original installation.

(c) All new installations or major replacements shall meet the applicable specifications or requirements for new vessels.

Subpart 113.50—Emergency Loudspeaker System

§ 113.50–1 Application.

(a) The provisions of this subpart, with the exception of § 113.50–90, shall apply to all ocean and coastwise passenger vessels contracted for on or after November 19, 1952. Ocean and coastwise vessels contracted for prior to November 19, 1952, shall meet the requirements of § 113.50–90.

§ 113.50–5 General requirements.

(a) All ocean and coastwise passenger vessels certificated to carry 500 or more persons, including officers and crew, and/or all passenger vessels whose lifeboats are stowed more than 100 feet from the navigating bridge, shall be equipped with an approved loudspeaker system which will enable an officer on the bridge to broadcast separately or collectively to the stations listed in this paragraph.

(1) Lifeboat stations, port.

(2) Lifeboat stations, starboard.

(3) Lifeboat embarkation stations, port.

(4) Lifeboat embarkation stations, starboard.

(5) Public spaces used for passenger assembly stations.

(6) Crew quarters.

(b) The system shall be controlled from a single location on the navigating bridge.

(c) Loudspeakers, as designated by the Commandant, at lifeboat and embarkation stations shall be arranged for two-way conversation with the navigating bridge.

(d) The emergency loudspeaker system shall be of a type approved by the Commandant. Systems installed on vessels contracted for on or after November 19, 1958, shall meet the requirements of Subpart 161.004 of Subchapter Q (Specifications) of this chapter.

§ 113.50–10 Power supply.

(a) The loudspeaker system shall be energized from the source of emergency lighting and power as required by Subpart 112.15 of this subchapter.

(b) Where the loudspeaker system requires a power supply of a character different from that available from the temporary source of emergency lighting and power, conversion equipment as required by Subpart 112.40 of this subchapter shall be provided.

§ 113.50–15 Location of loudspeakers and amplifiers.

(a) *General.* (1) Loudspeakers shall be located with due regard to the intended service and to minimize as much as possible the effect of feedback and other interference.

(2) In general, loudspeakers on open decks shall be directed toward the after end of the vessel and outboard by an angle of approximately 15 degrees.

(b) *Boat deck loudspeakers.* (1) A loudspeaker shall be located at each lifeboat handling station. The axis of the loudspeaker shall be directed aft and outboard in such a manner that the sound level at the lifeboat handling station will be not less than the levels given in Table 113.50–15.

(c) *Lifeboat embarkation and passenger assembly station loudspeakers.* (1) Loudspeakers shall be distributed throughout the lifeboat embarkation deck and locations designated by the vessel's station bill for the assembly of passengers in an emergency, in such number as to provide an even distribution of sound at a level not less than that specified in Table 113.50–15. An even

distribution of sound level is considered satisfied if the variation does not exceed plus or minus 3 decibels.

(d) *Crew quarters' loudspeakers.* (1) Loudspeakers shall be distributed in passageways throughout crew quarters in such number as to provide a sound level not less than that specified in Table 113.50–15 in each room with the doors closed.

(e) *Amplifier.* (1) The emergency loudspeaker amplifier, if not located in the same enclosure with the control panel, shall be located in the wheelhouse or in a compartment adjoining or opening into the wheelhouse.

TABLE 113.50–15—MINIMUM SOUND LEVEL REQUIREMENTS FOR LOUDSPEAKER SYSTEMS

[All data given in decibels] [1]

Location	Ground noise level minimum	Signal level		Voice level	
		Above ground noise	Total	Above ground noise	Total
Lifeboat stations	80	20	[2] 100	15	[2] 95
Embarkation deck and exterior passenger assembly points	80	20	[2] 100	15	[2] 95
Interior passenger assembly points	75	20	[2] 95	15	[2] 90
Crew quarters	60	18	[3] 78	12	[3] 72

[1] The zero decibel level shall be 0.0002 dyne per square centimeter.
[2] Measured at a distance of 10 feet from the loudspeaker and on the axis thereof.
[3] Measured in rooms with the doors to the passageways closed.

§ 113.50–20 Distribution of cable runs.

(a) Cable runs to the different loudspeaker groups shall be as widely separated from each other as possible to limit the extent of damage to the system from a single casualty. In addition, the distribution shall be such that a casualty to the port or starboard supplies to loudspeakers on boat and embarkation decks will render not more than half of the loudspeakers in the group inoperative. This may be accomplished by feeding the loudspeakers of a particular group alternately from a port and starboard multiconductor cable.

(b) Cable runs shall, where possible, be located in passageways and shall avoid staterooms, lockers, and other enclosed spaces.

§ 113.50–25 Type of cable and equipment enclosures.

(a) All cable used in connection with the system shall be either leaded and armored, impervious sheathed and armored or mineral insulated metal sheathed.

(b) All junction or connection boxes employed in the distribution system shall be of watertight construction.

§ 113.50–30 Shipboard tests.

(a) The operation of the system shall be observed to determine that voice reproduction is of good quality and intelligibility of a high order.

(b) Sound levels shall be measured with a sound level meter to demonstrate that the levels listed in Table 113.50–15 are met.

(1) Where the ground noise level with the vessel under way in moderate weather is in excess of the values listed in Table 113.50–15, the signal and voice levels shall be increased correspondingly so that the differential between ground noise level and the signal and voice levels shall be not less than the differential given in this table.

(c) It shall be demonstrated that grounding either conductor or "shorting" both conductors to any one lifeboat station loudspeaker, or to an embarkation deck loudspeaker, will not reduce the output of any one of the remaining loudspeakers by more than 3 decibels.

§ 113.50–35 Operation of emergency loudspeaker systems.

(a) The emergency loudspeaker system shall be used at the discretion of the master and shall function entirely independently of any public address or music distribution system.

(b) The emergency loudspeaker system shall not be used for entertainment purposes.

(c) The complete emergency loudspeaker system shall be given an operating test at least once every week. These tests shall be made by a licensed officer and the condition of the equipment entered in the vessel's log.

(d) When a vessel is equipped with a public address or music distribution system, means shall be provided adjacent to the emergency loudspeaker system control panel to silence the public address or music distribution systems.

§ 113.50–90 Emergency loudspeaker systems for existing vessels.

(a) *Existing vessels.* Emergency loudspeaker systems on ocean and coastwise passenger vessels contracted for prior to November 19, 1952, shall meet the requirements of this section.

(b) *General requirements.* (1) All passenger vessels the construction of which was begun prior to January 1, 1937, on which lifeboats are stowed more than 100 feet from the navigating bridge, and all passenger vessels the construction of which was begun prior to November 19, 1952, but on and after January 1, 1937, certificated to carry 1,000 persons or more, including officers and crew, shall be equipped with a loudspeaker system which shall enable an officer on the bridge to broadcast separately or collectively to the stations listed in this subparagraph.

(i) Lifeboat stations, port and starboard. (The deck or decks on which lifeboats are stowed and from which they are launched.)

(ii) Embarkation deck, port and starboard. (The deck or decks, designated by construction design or by the vessel's station bill, used for the embarkation of passengers and crew into lifeboats. If lifeboat stations are used for embarkation purposes, this requirement will be omitted.)

(iii) Main quarters for crew. (The quarters of the emergency squad, deck crew, and stewards assigned to passenger quarters.)

(iv) Public spaces. (The spaces designated by the vessel's station bill where passengers and crew are to assemble in an emergency.)

(2) The Commandant may, in special cases, exempt passenger vessels the construction of which was begun prior to January 1, 1937, having a small number of especially accessible lifeboats stowed more than 100 feet from the bridge: *Provided, however,* That no such vessel certificated to carry more than 200 persons, including officers and crew, shall be so exempted.

(3) Details of the system shall be in general agreement with §§ 113.50–5 through 113.50–35 insofar as is reasonable and practicable.

(4) Existing arrangements, materials, and facilities previously approved, but not meeting the applicable specifications or requirements set forth in §§ 113.50–5 through 113.50–35, may be continued in service so long as they are maintained in good condition to the satisfaction of the Officer in Charge, Marine Inspection. Minor repairs and minor alterations may be made to the same standards as the original installation provided that, in no case, will a greater departure from the standards of §§113.50–5 through 113.50–35 be permitted than presently exist. All new installations or major replacements shall meet the applicable specifications or requirements, for new vessels.

Subpart 113.55—Navigation Lights

§ 113.55–1 Application.

(a) The provisions of this subpart, with the exception of § 113.55–90, shall apply to all vessels contracted for on or after November 19, 1952. Vessels contracted for prior to November 19, 1952, shall meet the requirements of § 113.55–90.

§ 113.55–5 General requirements.

(a) All vessels and motorboats shall be equipped with navigation lights and shapes as prescribed by law and regulation.

§ 113.55–10 Construction of navigation lights.

(a) Navigation lights shall be of an approved type.

§ 113.55–15 Installation of navigation lights.

(a) Navigation lights shall be installed in such a manner that the angles of visibility and the minimum heights above the deck required by the applicable Rules of the Road will be assured.

(b) The light from a navigation light shall not be obscured by any part of the vessel's structure or rigging.

(c) Navigation lights shall be wired by means of a short length of heavy duty portable cable to a watertight receptacle outlet located adjacent thereto. Where the double lens, two-lamp type electric navigation light is installed, each lamp shall be connected to its branch circuit conductors by means of an individual portable cable and receptacle plug.

§ 113.55–20 Light screens.

(a) Light screens required by the Rules of the Road for port and starboard side lights shall be painted with a glossy black paint and shall project not less than three feet forward of the center of the light source.

§ 113.55–25 Navigation light indicator panel.

(a) Self-propelled vessels of 1,600 gross tons and over shall be provided with a navigation light indicator panel located in the wheelhouse to control electric side, masthead, range, and stern lights. The panel shall provide visible and audible indications of the failure of any of the above named navigation lights.

(b) Recommended circuit diagrams for navigation light indicator panels are shown in Figure 113.55–25 (b). Other circuit diagrams may be submitted for approval.

§ 113.55–90 Navigation lights for existing vessels.

(a) Navigation lights on vessels contracted for prior to November 19, 1952, shall meet the requirements covered in this section.

(b) Existing arrangements, materials, and facilities previously approved will be considered satisfactory so long as they are maintained in good condition to the satisfaction of the Office in Charge, Marine Inspection. Minor repairs and minor alterations may be made to the same standard as the original installation.

(c) All new installations or major replacements shall meet the applicable specifications or requirements.

Subpart 113.60—Signaling Lights

§ 113.60–1 Application.

(a) The provisions of this subpart, with the exception of § 113.60–90, shall apply to vessels contracted for on or after November 19, 1952. Vessels contracted for prior to November 19, 1952, shall meet the requirements of § 113.60–90.

§ 113.60–5 General requirements.

(a) Except as modified by § 33.50–1 of Subchapter D (Tank Vessels) of this chapter, all ocean and coastwise self-propelled vessels of over 150 gross tons shall be equipped with an efficient daylight signaling light of the type covered by this subpart.

§ 113.60–10 Detail requirements.

(a) The signaling light shall consist of a device which produces a narrow high-intensity beam of light suitable for daylight blinker communication at speeds up to 9 words (180 dots and/or dashes) per minute.

(b) The axial candlepower of the beam shall be not less than 60,000 candlepower. The beam shall have a total horizontal and vertical divergence of approximately 6 degrees. This divergence is defined as the angular limits of the beam where the candlepower has fallen to one-tenth of the axial candlepower.

(c) In addition to the requirements of paragraph (b) of this section, the candlepower of the beam in every direction within an angle of 0.7 degree from the axial shall not be less than 50 percent of the axial candlepower.

(d) The signaling light shall be fitted with a suitable sighting arrangement capable of directing the beam on to the receiving station.

(e) Signaling may be effected by keying the current through the lamp, by movement of shutters, or by other approved means.

(f) The signaling light may be either a fixed unit mounted on the top of the wheelhouse, a semi-fixed unit with arrangements for quick mounting at either wing of the navigating bridge, or a portable unit.

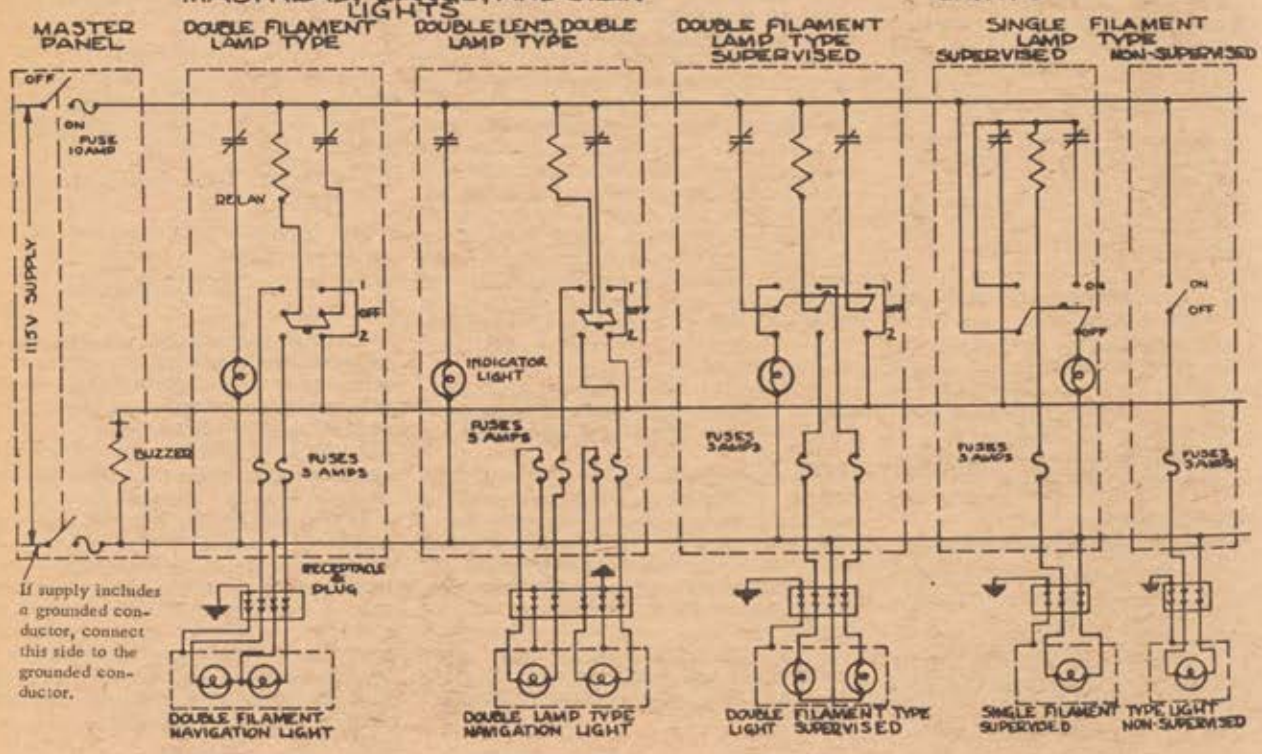
(g) Fixed or semifixed signaling lights shall be energized from the emergency lighting and power system as required by § 112.15–5(h) of this subchapter. Portable signaling units shall be energized from a self-contained storage battery capable of operating the unit 2 hours continuously without recharging.

§ 113.60–90 Signaling light for existing vessels.

(a) Signaling lights on vessels contracted for prior to November 19, 1952,

FIGURE 113.55-25(b)

SEMI-AUTOMATIC NAVIGATION LIGHT PANEL CIRCUITS



shall meet the requirements in this section.

(b) Ocean and coastwise ships over 150 gross tons shall be equipped with an efficient signaling lamp. This lamp shall be permanently fixed above the bridge and equipped with a Fresnel lens and high-speed bulb, operated by a weatherproof key, fitted with a suitable condenser. The lamp shall be so connected that it can be operated from the normal source of ship's current, the emergency source, and other emergency batteries if provided.

(c) Existing arrangements, materials, and facilities previously approved will be considered satisfactory as long as they are maintained in good condition to the satisfaction of the Officer in Charge, Marine Inspection. Minor repairs and minor alterations may be made to the same standard as the original installation. All new installations or major replacements shall meet the applicable specifications or requirements for new vessels.

Subpart 113.65—Whistle Operators

§ 113.65–1 Application.

(a) The provisions of this subpart, with the exception of § 113.65–90, shall apply to all vessels contracted for on or after November 19, 1952. Vessels contracted for prior to November 19, 1952, shall meet the requirements of § 113.65–90.

§ 113.65–5 General requirements.

(a) The general requirements for whistles, sirens and foghorns are contained in Part 26 of Subchapter C (Uninspected Vessels), Part 32 of Subchapter D (Tank Vessels), Part 77 of Subchapter H (Passenger Vessels), and Part 96 of Subchapter I (Cargo and Miscellaneous Vessels), of this chapter.

(b) Mechanical whistle or siren pull leads shall be as direct as possible and amply protected. When the leads are suspended for more than 15 feet, they should be supported from a corrosion-resistant cable with suitable bearers. The system shall be provided with ample corrosion-resistant springs to relieve all weight on the lever and for the proper functioning of the system.

(c) Materials and mechanical details shall be in general accordance with the requirements for mechanical telegraphs given in § 113.35–25 except that bronze or stainless steel aircraft type wire rope or other means specifically approved may be used in lieu of the brass wire specified.

(d) When electrically operated whistles and sirens are installed, all parts shall be independent of the primary system.

(e) When electrically operated valves for whistles or sirens are located more than 5 feet from the whistle, an automatic drain feature for the steam whistle pipe shall be installed.

(f) The supply for an electrically operated whistle or siren shall be from the emergency lighting and power system as required by Part 112 of this chapter.

§ 113.65–90 Whistle operators for existing vessels.

(a) Whistle operators on vessels contracted for prior to November 19, 1952, shall meet the requirements in this section.

(b) Existing arrangements, materials, and facilities previously approved will be considered satisfactory so long as they are maintained in good condition to the satisfaction of the Officer in Charge, Marine Inspection. Minor repairs and minor alterations may be made to the same standard as the original installation.

(c) All new installations or major replacements shall meet the applicable specifications or requirements for new vessels.

Subpart 113.70—Smoke Detector Systems

§ 113.70–1 Application.

(a) Where a smoke detector system is installed, the provisions of this subpart, with the exception of § 113.70–90, shall apply to all installations contracted for on or after November 19, 1952. Installations contracted for prior to November 19, 1952, shall meet the requirements of § 113.70–90.

(b) For the vessels on which a smoke detector system is required, see Part 76 of Subchapter H (Passenger Vessels) of this chapter.

§ 113.70–5 General requirements.

(a) The smoke detector control unit shall be of a type approved by the Commandant. Systems installed on vessels contracted for on or after November 19, 1959, shall meet the requirements of Subpart 161.002 of Subchapter Q (Specifications) of this chapter.

(b) All electric cable installed in conjunction with the smoke detector system shall be either leaded and armored, impervious sheathed and armored or mineral insulated metal sheathed.

(c) Cable runs between the smoke detector control unit and the supply switchboard shall be as direct as possible and shall avoid staterooms, lockers, and other enclosed spaces where the cable could be damaged by a localized fire or by other causes.

§ 113.70–10 Power supply.

(a) On vessels fitted with an automatically started emergency lighting and power system, the smoke detector system shall be supplied by a branch circuit from the emergency switchboard. On vessels fitted with a temporary source of emergency lighting and power, the branch circuit may be connected to the temporary emergency source of supply.

(b) On vessels not fitted with an automatically started emergency lighting and power system, the smoke detector system shall be supplied from a source as approved by the Commandant.

§ 113.70–90 Equipment and installations on vessels contracted for prior to November 19, 1952.

(a) Existing arrangements, materials, and facilities previously approved, but not meeting the applicable specifications or requirements set forth in §§ 113.70–5 and 113.70–10, may be continued in service so long as they are maintained in good condition to the satisfaction of the Officer in Charge, Marine Inspection. Minor repairs and minor alterations may be made to the same standards as the original installation: *Provided*, That, in no case, will a greater departure from the standards of §§ 113.70–5 and 113.70–10 be permitted than presently exist. All new installations or major replacements shall meet the applicable specifications or requirements for new vessels.

SUBCHAPTER K—MARINE INVESTIGATIONS AND SUSPENSION AND REVOCATION PROCEEDINGS

PART 136—MARINE INVESTIGATION REGULATIONS

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Subpart 136.21—Computation of Time

136.21-1 Computation of time.

Subpart 136.23—Evidence of Criminal Liability

136.23-1 Evidence of criminal liability.

AUTHORITY: The provisions of this Part 136 issued under R.S. 4405, as amended, 4462, as amended, secs. 2, 633, 63 Stat. 496, 545; 46 U.S.C. 375, 416, 14 U.S.C. 2, 633. Interpret or apply R.S. 4450, as amended, secs. 1, 2, 49 Stat. 1544, 1545, as amended, sec. 17, 54 Stat. 166, as amended, sec. 3, 54 Stat. 347, as amended, sec. 3, 70 Stat. 152, sec. 93 (e), (f), 63 Stat. 504, secs. 10-13, 18 Stat. 128, as amended, sec. 15, 38 Stat. 1184, as amended, sec. 4, 67 Stat. 462, sec. 3, 68 Stat. 675; 46 U.S.C. 239, 367, 526p, 1333, 390b, 14 U.S.C. 93 (e), (f), 33 U.S.C. 361-364, 365, 43 U.S.C. 1333, 50 U.S.C. 198. Treasury Department Orders 120, July 31, 1950, 15 F.R. 6521; 167-14, November 26, 1954, 19 F.R. 8026; 167-15, January 3, 1955, 20 F.R. 840; 167-17, June 29, 1955, 20 F.R. 4976; 67-20, June 18, 1956, 21 F.R. 4894, unless otherwise noted.

Subpart 136.01—Authority and Scope of Regulations

§ 136.01-1 Authority and scope of regulations.

The regulations in this part promulgated pursuant to the provisions of R.S. 4450, as amended (46 U.S.C. 239), shall govern the conduct of investigations relating to:

(a) Marine casualties and accidents; and,

(b) Acts in violation of Title 46, U. S. Code, sections 170, 214, 215, 222, 224, 224a, 226, 228-234, 239, 240, 361, 362, 364, 367, 372, 373, 375-382, 384, 385, 390-390g, 391, 391a, 392, 393, 399, 400, 402-416, 435-440, 451-453, 460-463, 464, 467, 470-481, 482, 489-498, or Title 50, U. S. Code, section 198, or any of the regulations issued thereunder; or,

(c) Acts of incompetency or misconduct committed by any licensed officer or holder of a certificate of service when such acts are committed in connection with any marine casualty or accident.

Subpart 136.03—Definitions

§ 136.03-1 Marine casualty or accident.

(a) The term "marine casualty or accident" shall mean any casualty or accident involving any vessel other than public vessels if such casualty or accident occurs upon the navigable waters of the United States, its territories or possessions, or any casualty or accident wherever such casualty or accident may occur involving any United States' vessel which is not a public vessel. (See § 136.03-40 for definition of "Public Vessel.")

(b) A marine casualty or accident shall include any occurrence involving a vessel which results in damage by or to the vessel, its apparel and gear, and/or cargo, or injury or loss of life of any of its crew or passengers; and includes inter alia, collisions, strandings, groundings, founderings, heavy weather damage, fires, explosions, failure of gear and equipment and any other damage which might affect and/or impair the seaworthiness thereof.

§ 136.03-5 Major marine casualty.

A casualty shall be considered a major marine casualty whenever it indicates serious damage to material and results in loss of life or serious injury to crew and/or passengers. A casualty may also be deemed a major marine casualty when the circumstances or unusual conditions thereof are of such a nature that the proper investigation cannot be accomplished solely by an investigating officer.

§ 136.03-10 Party in interest.

The term "party in interest" shall mean any person whom the Marine Board of Investigation or the investigating officer shall find to have a direct interest in the investigation conducted by it and shall include an owner, a charterer, or the agent of such owner or charterer of the vessel or vessels involved in the marine casualty or accident, and all licensed or certificated personnel whose conduct, whether or not involved in a marine casualty or accident is under investigation by the Board or investigating officer.

§ 136.03-15 Commandant.

The Commandant, U.S. Coast Guard, is that officer who acts as chief of the Coast Guard and is charged with the administration of the Coast Guard.

§ 136.03-20 Coast Guard district.

A Coast Guard district is one of the geographical areas whose boundaries are described in 33 CFR Part 3.

§ 136.03-25 District Commander.

The District Commander is the chief of a Coast Guard district and is charged with the administration of all Coast Guard responsibilities and activities within his respective district, except those functions of examiners under the Administrative Procedure Act (60 Stat. 237, 5 U. S. C. 1001 et seq.) and activities of independent units of the Coast Guard, such as the Coast Guard Yard and the Coast Guard Academy.

§ 136.03-30 Investigating officer.

An investigating officer is an officer or employee of the Coast Guard designated by the Commandant or the District Commander for the purpose of making investigations of marine casualties and accidents or other matters pertaining to the conduct of seamen.

§ 136.03-40 Public vessels.

Vessels within the statutory exemptions of Title LII of the Revised Statutes of the United States (R.S. 4399-4500) (as amended) relating to the inspection of vessels, are public vessels, and therefore not subject to the regulations in this part. To be deemed public vessels such vessels must:

(a) Be used for a public purpose, not in trade or commercial service; and,

(b) Be owned outright by the United States; it is not sufficient that the United States holds the vessel under a bareboat charter.

Subpart 136.05—Notice of Marine Casualty and Voyage Records

§ 136.05-1 Notice of marine casualty.

The owner, agent, master, or person in charge of a vessel involved in a marine casualty shall give notice as soon as possible to the nearest marine inspection office of the Coast Guard whenever the casualty results in any of the following:

(a) Actual physical damage to property in excess of $1500.00;

(b) Material damage affecting the seaworthiness or efficiency of a vessel;

(c) Stranding or grounding;

(d) Loss of life; or,

(e) Injury causing any persons to remain incapacitated for a period in excess of 72 hours; except injury to harbor workers not resulting in death and not resulting from vessel casualty or vessel equipment casualty.

§ 136.05-5 Substance of marine casualty notice.

The notice required in § 136.05-1 shall show the name and official number of the vessel involved, the owner or agent thereof, and insofar as is practicable, the nature and probable occasion of the casualty, the locality in which it occurred, the nature and extent of injury to personnel and the damage to property.

§ 136.05-10 Report by officer in charge of vessel in person.

(a) In addition to the notice required by § 136.05-1, the person in charge of the vessel shall, as soon as possible report in writing and in person to the Officer in Charge, Marine Inspection, at the port in which the casualty occurred or nearest the port of first arrival: *Provided*, That when from distance it may be inconvenient to report in person it may be done in writing only. The written report required for personal accident shall be made on Form CG-924E and submitted for each individual injured and each loss of life. For all other vessel casualties the written report shall be made on Form CG-2692.

(b) If filed without delay, the Form CG-924E or CG-2692 may also provide the notice required by § 136.05-1.

(Secs. 13, 17, 54 Stat. 166, as amended, 46 U.S.C. 526l(c))

§ 136.05-15 Voyage records, retention of.

(a) The owner, agent, master, or person in charge of any vessel involved in a marine casualty shall retain such voyage records as are maintained by the vessel, such as both rough and smooth deck and engine room logs, bell books, navigation charts, navigation work books, compass deviation cards, gyro records, stowage plans, records of draft, aids to mariners, night order books, radiograms sent and received, radio logs, crew and passenger lists, articles of shipment, official logs and other material which might be of assistance in investigating and determining the cause of the casualty. The owner, agent, master, other officer or person responsible for the custody thereof, shall make these records available upon request, to a duly authorized investigating officer, examiner, officer, or employee of the Coast Guard.

(b) The investigating officer may substitute photostatic copies of the voyage records referred to in paragraph (a) of this section when they have served their purpose and return the original records to the owner or owners thereof.

§ 136.05-20 Report of accident to aid to navigation.

Whenever a vessel collides with a lightship, buoy, or other aid to navigation under the jurisdiction of the Coast Guard, or is connected with any such collision, it shall be the duty of the person in charge of such vessel to report the accident to the nearest Officer in Charge, Marine Inspection. No report on Form CG-2692 is required unless one or more of the results listed in section 136.05-1 occur.

§ 136.05-25 Reports when state of war exists.

During the period when a state of war exists between the United States and any foreign nation, communications in regard to casualties or accidents shall be handled with caution and the reports shall not be made by radio or by telegram.

Subpart 136.07—Investigations

§ 136.07-1 Commandant or District Commander to order investigation.

(a) The Commandant or District Commander upon receipt of information of a marine casualty or accident, will immediately cause such investigation as may be necessary in accordance with the regulations in this part.

(b) The investigations of marine casualties and accidents and the determinations made are for the purpose of taking appropriate measures for promoting safety of life and property at sea, and are not intended to fix civil or criminal responsibility.

(c) The investigation will determine as closely as possible:

(1) The cause of the accident;

(2) Whether there is evidence that any failure of material (either physical or design) was involved or contributed to the casualty, so that proper recommendations for the prevention of the recurrence of similar casualties may be made;

(3) Whether there is evidence that any act of misconduct, inattention to duty, negligence or willful violation of the law on the part of any licensed or certificated man contributed to the casualty, so that appropriate proceedings against the license or certificate of such person may be recommended and taken under Title 46, U.S. Code, section 239;

(4) Whether there is evidence that any Coast Guard personnel or any representative or employee of any other government agency or any other person caused or contributed to the cause of the casualty; or,

(5) Whether the accident shall be further investigated by a Marine Board of Investigation in accordance with regulations in Subpart 136.09.

§ 136.07-5 Investigating officers, powers of.

(a) An investigation of all marine casualties or accidents reported pursuant to § 136.05-1 will be made by an investigating officer designated by the Commandant or the District Commander.

(b) Such investigating officer shall have the power to administer oaths, subpoena witnesses, require persons having knowledge of the subject matter of the investigation to answer questionnaires and require the production of relevant books, papers, documents and other records.

(c) Attendance of witnesses or the production of books, papers, documents or any other evidence shall be compelled by a similar process as in the United States District Court.

§ 136.07-7 Opening statement.

The investigating officer or the Chairman of a Marine Board of Investigation shall open the investigation by announcing the statutory authority for the proceeding and he shall advise parties in interest concerning their rights to be represented by counsel, to examine and cross-examine witnesses, and to call witnesses in their own behalf.

§ 136.07-10 Report of investigation.

(a) At the conclusion of the investigation the investigating officer shall submit to the Commandant via the Officer in Charge, Marine Inspection, and the District Commander, a full and complete report of the facts as determined by his investigation, together with his opinions and recommendations in the premises. The District Commander shall forward the investigating officer's report to the Commandant with an indorsement stating:

(1) Approval or otherwise of the findings of fact, conclusions and recommendations;

(2) Any action taken with respect to the recommendations;

(3) Whether or not any action has been or will be taken under Part 137 of this subchapter to suspend or revoke licenses or certificates; and,

(4) Whether or not violations of laws or regulations relating to vessels have been reported on Form CG-2636, report of violation of navigation laws.

(b) Investigating officers in foreign ports shall forward their reports directly to the Commandant.

§ 136.07-15 Recommendations, action on.

Where the recommendations of an investigating officer are such that their accomplishment is within the authority of the District Commander or any of the personnel under his command, immediate steps shall be taken to put them into effect and his forwarding endorsement shall so indicate.

§ 136.07-20 Transfer of jurisdiction.

When it appears to the District Commander that it is more advantageous to conduct an investigation in a district other than in the district where the casualty was first reported, that officer shall transfer the case to the other district together with any information or material relative to the casualty he may have.

§ 136.07-25 Testimony of witnesses in other districts, depositions.

When witnesses are available in a district other than the district in which the investigation is being made, testimony or statements shall be taken from witnesses in the other districts by an investigating officer and promptly transmitted to the investigating officer conducting the investigation. Depositions may be taken in the manner prescribed by regulations in Subpart 136.12.

§ 136.07-30 Testimony of witnesses under oath.

(a) Witnesses to marine casualties or accidents appearing before an investigating officer may be placed under oath and their testimony may be reduced to writing.

(b) Written statements and reports submitted as evidence by witnesses shall be sworn to before an officer authorized to administer oaths and such statements and/or reports shall be signed.

§ 136.07-35 Counsel for witnesses and parties in interest.

(a) All parties in interest shall be allowed to be represented by counsel, to examine and cross-examine witnesses and to call witnesses in their own behalf.

(b) Witnesses who are not parties in interest may be assisted by counsel for the purpose of advising such witnesses concerning their rights; however, such counsel will not be permitted to examine or cross-examine other witnesses or otherwise participate in the investigation.

§ 136.07-45 Foreign units of Coast Guard, investigation by.

Investigations of marine casualties conducted by foreign units of the Coast

Guard shall be in accordance with the regulations in this part and all actions taken in connection with the investigations of such marine casualties entered in the official log(s) of the vessel(s) concerned.

§ 136.07–50 Marine Board of Investigation, recommendations for.

When the District Commander is of the opinion, as a result of an investigation under § 136.07–1, or otherwise, that a marine casualty or accident is a major marine casualty (see § 136.03–5), that officer shall immediately inform the Commandant by dispatch with his recommendation whether a further investigation by a Marine Board of Investigation shall be conducted.

§ 136.07–55 Information to be furnished Marine Board of Investigation.

When a Marine Board of Investigation is convened in accordance with §136.09–1, the investigating officer shall immediately furnish the board with all testimony, statements, reports, documents, papers, a list of witnesses including those whom he has examined, other material which he may have gathered, and a statement of any findings of fact which he may have determined. The preliminary investigation shall cease forthwith and the aforementioned material shall become a part of the Marine Board of Investigation's record.

Subpart 136.09—Marine Board of Investigation

§ 136.09–1 Commandant to designate.

If as a result of an investigation of any casualty, upon recommendation of a District Commander or upon receipt of information from any other source, it appears to the Commandant that a marine casualty or accident is a major casualty (see § 136.03–5) and that further investigation thereof would tend to promote safety of life and property at sea and would be in the public interest, the Commandant will designate an appropriate Marine Board of Investigation to conduct such investigation forthwith.

§ 136.09–5 Powers of Marine Board of Investigation.

Any Marine Board of Investigation so designated shall have the power to administer oaths, summon witnesses, require persons having knowledge of the subject matter of the investigation to answer questionnaires, and to require the production of relevant books, papers, documents or any other evidence. Attendance of witnesses or the production of books, papers, documents or any other evidence shall be compelled by a similar process as in the United States District Court. The chairman shall administer all necessary oaths to any witnesses summoned before said Board.

§ 136.09–10 Witnesses, payment of.

Any witness subpoenaed under § 136.09–5 shall be paid such fees for his travel and attendance as shall be certified by the chairman of a Marine Board of Investigation or an investigating officer, in accordance with § 136.11–10.

§ 136.09–15 Time and place of investigation, notice of; rights of witnesses, etc.

Reasonable notice of the time and place of the investigation shall be given to any person whose conduct is or may be under investigation and to any other party in interest. All parties in interest shall be allowed to be represented by counsel, to cross-examine witnesses, and to call witnesses in their own behalf.

§ 136.09–17 Sessions to be public.

(a) All sessions of a Marine Board of Investigation for the purpose of obtaining evidence shall normally be open to the public, subject to the provision that the conduct of any person present shall not be allowed to interfere with the proper and orderly functioning of the Board. Sessions will not be open to the public when evidence of a classified nature or affecting national security is to be received.

§ 136.09–20 Record of proceedings.

The testimony of witnesses shall be transcribed and a complete record of the proceedings of a Marine Board of Investigation shall be kept. At the conclusion of the investigation a written report shall be made containing findings of fact, opinions, and recommendations to the Commandant for his consideration.

§ 136.09–25 U.S. Attorney to be notified.

The recorder of a Marine Board of Investigation shall notify the United States Attorney for the District in which the Marine Board of Investigation is being conducted of the nature of the casualty under investigation and time and place the investigation will be made.

§ 136.09–30 Action on report.

Upon approval of the report of a Marine Board of Investigation the Commandant will require to be placed into effect such recommendations as he may deem necessary for the better improvement and safety of life and property at sea.

§ 136.09–35 Preferment of charges.

(a) If in the course of an investigation by a Marine Board there appears probable cause for the preferment of charges against any licensed or certificated personnel, the Marine Board shall, either during or immediately following the investigation and before the witnesses have dispersed, apprise the District Commander of such evidence for possible action in accordance with Part 137 of this subchapter, without waiting for the approval of the report by the Commandant. Such action or proceedings shall be independent and apart from any other action which may be later ordered by the Commandant or taken by other authorities.

Subpart 136.11—Witnesses and Witness Fees

§ 136.11–1 Employees of vessels controlled by Army or Navy as witnesses.

No officer, seaman, or other employee of any public vessel controlled by the Army or Navy (not including the Coast Guard) of the United States, shall be summoned or otherwise required to appear as a witness in connection wtih any investigation or other proceeding without the consent of the Government agency concerned.

§ 136.11–5 Coercion of witnesses.

Any attempt to coerce any witness or to induce him to testify falsely in connection with a shipping casualty, or to induce any witness to leave the jurisdiction of the United States, is punishable by a fine of $5,000.00 or imprisonment for one year, or both such fine and imprisonment.

§ 136.11–10 Witness fees, subsistence, and mileage.

(a) Duly subpoenaed witnesses, other than Government witnesses, in any investigation or other proceeding may apply for payment for their services as witnesses. Upon the submission of such a request for payment (Standard Form 1157), the chairman of a Marine Board of Investigation or the investigating officer will forward the request to the authorized Coast Guard certifying officer together with a statement that:

(1) The witness seeking payment was duly subpoenaed as a witness by the Coast Guard;

(2) The witness appeared pursuant to such subpoena; and

(3) The witness is entitled to the witness fees, and/or subsistence, and/or mileage claimed.

(b) Upon receipt of such claim (Standard Form 1157) with supporting statement, the Coast Guard authorized certifying officer may certify to the propriety of the claim according to the following scale and submit it to the appropriate disbursing officer for payment:

(1) A fee of $4 for each day or fraction thereof of attendance and for the time necessarily occupied in going to and returning from the investigation or hearing in the case of a witness called to testify as to the facts. A witness called to testify as an expert may be paid a higher fee provided such higher fee is approved by the Commandant prior to his appearance at the investigation or hearing.

(2) A subsistence allowance of $8 for each day or fraction thereof if the witness resides at a distance so far removed from the place at which the investigation, hearing or other proceeding was held as to prohibit his returning to his place of residence each day: *Provided*, That the witness was required to remain at the place at which the investigation, hearing or other proceeding was held for more than one day: *Provided further*, That in the case of employed merchant marine personnel their place of residence will be construed to be the vessel upon which they are employed, and in the case of unemployed merchant marine personnel their place of residence will be construed to be their actual place of residence when ashore, rather than the residence of their next of kin. In cases where subsistence allowance is payable, addditional subsistence allowance of $8 per day may be paid for each day necessarily occupied

in traveling from the place of residence to attend the investigation, hearing or other proceeding hereunder and return to such residence or place. No subsistence allowance for travel time shall be paid if witness is already present at place of investigation, hearing or other proceeding hereunder. In computing the subsistence allowance due a witness the day shall be regarded as beginning on the hour at which it was necessary for the witness to leave his home in order to arrive at the appointed time at the place where the investigation, hearing or other proceeding is held. The witness is to leave the place of investigation, hearing or other proceeding by the first available transportation after his dismissal.

(3) In computing the witness fee or the subsistence allowance, a fraction of a day will be considered as a whole day.

(4) Travel money at the rate of 8 cents per mile, not to exceed 100 miles, for actual travel from place of residence or place where subpoena was served to place at which the investigation, hearing or other proceeding was held. Travel money at the rate of 8 cents per mile, not to exceed 100 miles, is also allowed for the actual travel involved in return of witness to his place of residence, or if the subpoena was served at a place other than the witness's place of residence, to the place where said subpoena was served. All payments of travel money shall be computed on the basis of mileage by the shortest route. When a witness is furnished transportation by the Government no mileage allowance is authorized. If a witness is unable to furnish funds for transportation charges, Government transportation requests may be issued for his transportation, at the lowest first class rate available, to and from the place of investigation, hearing or other proceeding, in which case the mileage allowance is not authorized. When two or more witnesses are transported at the same time in the same privately owned vehicle, operated by one of the witnesses, the mileage allowance for only one witness is authorized.

(5) The fees provided in this section shall not apply in Alaska. In Alaska such witnesses are entitled to the witness fees and mileage prescribed for witnesses before the United States District Court in the judicial division in which the investigation, hearing or other proceeding is held, as set forth in 28 CFR 21.3.

Subpart 136.12—Testimony by Interrogatories and Depositions

§ 136.12–1 Application, procedure, and admissibility.

(a) Witnesses shall be examined orally, except that for good cause shown, testimony may be taken by deposition upon application of any party in interest or upon the initiative of the investigating officer or Marine Board of Investigation.

(b) Applications to take depositions shall be in writing setting forth the reasons why such deposition should be taken, the name and address of the witness, the matters concerning which it is expected the witness will testify, and the time and place proposed for the taking of the deposition. Such application shall be made to an investigating officer or the Marine Board of Investigation prior to or during the course of the proceedings.

(c) The investigating officer or Marine Board of Investigation, shall, upon receipt of the application, if good cause is shown, make and serve upon the parties an order which will specify the name of the witness whose deposition is to be taken, the time and place of the taking of such deposition and shall contain a designation of the officer before whom the witness is to testify. Such deposition may be taken before any officer authorized to administer oaths by the laws of the United States.

(d) The party desiring the deposition may submit a list of interrogatories to be propounded to the absent witness; then the opposite party after he has been allowed a reasonable time for this purpose, may submit a list of cross-interrogatories. If either party objects to any question of the adversary party, the matter shall be presented to the investigating officer or Marine Board of Investigation for a ruling. Upon agreement of the parties on a list of interrogatories and cross-interrogatories (if any) the investigating officer or Marine Board of Investigation may propound such additional questions as may be necessary to clarify the testimony given by the witness.

(e) The subpoena referred to in Subpart 137.15 of this subchapter together with the list of interrogatories and cross-interrogatories (if any) shall be forwarded to the officer designated to take such deposition. This officer will cause the subpoena to be served personally on the witness. After service the subpoena shall be endorsed and returned to the investigating officer or Marine Board of Investigation.

(f) When the deposition has been duly executed it shall be returned to the investigating officer or Marine Board of Investigation. As soon as practicable after the receipt of the deposition the investigating officer or Marine Board of Investigation shall present it to the parties for their examination. The investigating officer or Marine Board of Investigation shall rule on the admissibility of the deposition or any part thereof and of any objection offered by either party thereto.

Subpart 136.13—Disclosure of Records

§ 136.13–1 General.

(a) Upon oral or written inquiry to the Coast Guard, information as to the time, place, and general subject matter of investigations conducted under this part will be released except when such information is held confidential for security reasons. The inquiry should be made to the Officer in Charge, Marine Inspection, who has cognizance of the investigation.

(b) Other information with regard to such investigations which is required to be kept by the Coast Guard will be released only to the extent and under the conditions provided in this subpart.

§ 136.13–5 Applications.

(a) *Form.* The applications for access to and release of information may be made orally except when the regulations in this subpart require a written application for such record. When a written application is required, the application should be addressed to the Officer in Charge, Marine Inspection, or to the person designated as having authority to grant access to or release of information from such records. The written application shall be executed by the parties desiring the information or by any person designated to represent such party as described in § 136.13–10.

(b) *Contents.* The application shall:

(1) Clearly state or describe the information desired;

(2) Identify the applicant, and if the applicant is a representative of another, specify the nature of the representation and attach proof of designation when required;

(3) Set forth the interest of the applicant in the subject matter;

(4) The purpose for which the information is desired; and

(5) Whether or not the information or record sought is intended for use in prosecuting a claim against the United States.

§ 136.13–10 Designation of representatives.

(a) In any case when access to or release of information from any record is permitted to any party by this subpart, the permission shall extend, when such party is deceased or incompetent, to an executor, administrator, heir, guardian, trustee, or legal representative of such party: *Provided*, That the relationship is established by production of satisfactory documentary evidence.

(b) When access to or release of information from any record is sought by one acting as agent or attorney on behalf of any party recognized by regulations in this chapter, the representation as agent or attorney shall be established by the filing with the Officer in Charge, Marine Inspection, documentary proof of such representation. This proof may be in one of the following forms:

(1) A statement of authority in the handwriting of and signed by the party represented; or,

(2) A notarized statement of authority signed by the party represented; or,

(3) A copy of a contract or retainer signed by the party represented.

(c) This authorization shall contain a statement of the specific matters in which representation is authorized.

§ 136.13–15 Casualties involving loss of life.

(a) Records of investigations involving loss of life resulting from marine casualties are public records available for inspection, upon oral or written inquiry.

§ 136.13–20 Casualty investigation records.

(a) Records of investigation conducted by investigating officers pursuant to the provisions of this part, after

action thereon by the District Commander, will be made available to parties in interest before such investigation upon oral or written inquiry. Such records will be made available to persons otherwise properly and directly concerned upon written application to the District Commander or the Officer in Charge, Marine Inspection, having cognizance of such investigation. If extra copies of the records are available, such copies may be furnished to parties in interest.

(b) The records of investigations of marine casualties made by investigating officers, which will be made available to persons properly and directly concerned, shall include notice of casualty or accident, statements and/or testimony of witnesses, exhibits, and any other evidentiary material presented in the investigations, and the findings of fact as determined by the investigating officers, but shall not include the opinions, conclusions, and recommendations of such officers. However, in casualties involving loss of life, the investigating officer's opinions, conclusions and recommendations will be released after final action thereon has been taken by the Commandant.

(c) The District Commander or his representative, upon inquiry, will advise persons properly and directly concerned as to whether or not further action will be recommended or instituted, such as appropriate suspension and revocation proceedings, citation for violation(s) involving fines or penalties, or a recommendation for referral of the record of investigation to the U.S. Department of Justice for further investigation and possible criminal action.

§ 136.13–25 Records of Marine Boards of Investigation.

(a) The record of investigation made by a Marine Board of Investigation will be made available to parties in interest at any stage of the Board's proceedings upon oral or written inquiry to the chairman: *Provided*, That such request does not, in any way, interfere with the proper and orderly functioning of the Board. After the Board has completed its investigation, the record will be made available to parties in interest upon oral or written inquiry to the District Commander or Officer in Charge, Marine Inspection, having cognizance of such investigation. Also, such records will be made available to persons otherwise properly and directly concerned upon written application to the District Commander or Officer in Charge, Marine Investigation, having cognizance of such investigation.

(b) Records of a Marine Board of Investigation shall include testimony and/or statements of witnesses, exhibits, records of investigation made by an investigating officer, and any other evidentiary material used by the Board in arriving at its determination.

(c) The report of a Marine Board of Investigation, consisting of the findings of fact, conclusions, opinions, and recommendations shall not become public or be made available until final action thereon has been taken by the Commandant. At such time the report will be made available in the same manner as provided for the record of investigation in paragraph (a) of this section.

§ 136.13–30 Records confidential.

(a) Except as specifically set forth in this subpart, all files, records, testimony, documents, reports, or other data pertaining to the internal management of the Marine Board of Investigation or to the investigation or disposition of charges or petitions during the non-public investigative stages of the investigation and before the institution of a Marine Board in the course of investigation, which have not been offered in evidence during the investigation or have not been made a part of the official record by stipulation, in Coast Guard Headquarters or in other offices, are administrative records and are not available to public inspection.

§ 136.13–35 Production upon compulsory process.

(a) When a request for information or material from a marine casualty investigation record is denied for any reason, the applicant shall be advised that the information or material may be produced upon service of a subpena duces tecum or an order from a court of competent jurisdiction if such information or material is not held confidential for security reasons.

§ 136.13–40 Costs.

The access to and release of information, as authorized in this subpart, shall be subject to the payment of costs. (See 33 CFR 1.25.)

Subpart 136.15—Persons in Service of Coast Guard

§ 136.15–1 Persons in service of Coast Guard.

(a) No person in the service of the Coast Guard shall, without prior approval of the Commandant, give any testimony with respect to any investigation or any other official proceedings in any suit or action in the courts. This applies equally to cases in state or Federal courts and to civil as well as criminal cases.

(b) In cases involving (1) civil litigation between private parties; or, (2) criminal matters before state courts; or, (3) civil litigation for or against the United States where Coast Guard personnel are called by parties opposing the United States; an affidavit by the litigant or his attorney setting forth the interest of the litigant and the information with respect to which the testimony of such Coast Guard officer or employee is desired must be submitted before permission to testify will be granted. Permission to testify will, in all cases, be limited to the information set forth in the affidavit, or to such portions thereof as may be deemed proper. In addition to the permission required by this paragraph, the Commandant may insist that the appearance of the Coast Guard officer or employee as a witness be conditioned on the issuance of a subpena or subpena duces tecum (as appropriate) from a court of competent jurisdiction.

(c) In cases where the appearance of Coast Guard personnel is desired by counsel representing the United States to support the affirmative claims or defenses of the United States in civil matters or on behalf of the United States in criminal matters no affidavit as described in paragraph (b) of this section shall be required, but the Commandant's prior approval must nevertheless be obtained, except in those cases where the Coast Guard personnel desired as witnesses file the original complaint or have made original inquiry into the subject matter which resulted in the filing of an original complaint.

Subpart 136.19—Construction of Regulations and Rules of Evidence

§ 136.19–1 Construction of regulations.

The regulations in this part shall be liberally construed to insure just, speedy, and inexpensive determination of the issues presented.

§ 136.19–5 Adherence to rules of evidence.

As hearings under this part are administrative in character, strict adherence to the formal rules of evidence is not imperative. However, in the interest of orderly presentation of the facts of a case, the rules of evidence should be observed as closely as possible.

Subpart 136.21—Computation of Time

§ 136.21–1 Computation of time.

The time, within which any act, provided by the regulation in this subchapter, or an order of the Marine Board of Investigation is to be done, shall be computed by excluding the first day and including the last unless the last day is Sunday or a legal holiday, in which case the time shall extend to and include the next succeeding day that is not a Sunday or legal holiday: *Provided, however*, That where the time fixed by the regulations in this subchapter or an order of the Board is five days or less all intervening Sundays or legal holidays, other than Saturdays, shall be excluded.

Subpart 136.23—Evidence of Criminal Liability

§ 136.23–1 Evidence of criminal liability.

If as a result of any investigation or other proceeding conducted hereunder, evidence of criminal liability on the part of any licensed officer or certificated person or any other person is found, such evidence shall be referred to the U.S. Attorney General.

PART 137—SUSPENSION AND REVOCATION PROCEEDINGS

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Subpart 137.60—Persons in Service of Coast Guard

137.60-1 Testimony by Coast Guard personnel.

AUTHORITY: The provisions of this Part 137 issued under R.S. 4405, as amended, and 4462, as amended, and sec. 633, 63 Stat. 545; 46 U.S.C. 375, 416, 14 U.S.C. 633. Interpret or apply R.S. 4426, as amended, and 4450, as amended, secs. 1, 2, 49 Stat. 1544, 1545, as amended, secs. 7, 17, 54 Stat. 165, 166, as amended, secs. 1 to 12, 60 Stat. 237–244, secs. 1, 2, 68 Stat. 484, sec. 3, 68 Stat. 675, sec. 3, 70 Stat. 152; 46 U.S.C. 239, 239a, 239b, 367, 390b, 404, 526f, 526p, 5 U.S.C. 1001–1011, 50 U.S.C. 198. Treasury Department Orders 120, July 31, 1950, 15 F.R. 6521; 167-9, August 3, 1954, 19 F.R. 5195; 167-14, November 26, 1954, 19 F.R. 8026; 167-15, January 3, 1955, 20 F.R. 840; 167-17, June 29, 1955, 20 F.R. 4976; 167-20, June 18, 1956, 21 F.R. 4894.

Subpart 137.01—Authority and Scope

§ 137.01-1 Authority for regulations.

(a) The authority to prescribe regulations generally with respect to navigation and vessel inspection is set forth in Title 46, U.S. Code, sections 375 and 416 (R.S. 4405, as amended, 4462, as amended). Under the provisions of Title 46, U.S. Code, section 372 (R.S. 4403, as amended), the Commandant, United States Coast Guard, superintends the administration of the navigation and vessel inspection laws, and is required to produce a correct and uniform administration of such laws, rules and regulations.

(1) Where the provisions in Title 46, U.S. Code, section 239, or other laws or regulations contain a reference to "title 52 of the Revised Statutes or of any of the regulations issued thereunder," or one similar to it, it is deemed to be a general reference to the applicable provisions in Title 46, U.S. Code, sections 170, 214, 215, 222, 224, 224a, 226, 228, 229, 230–234, 239, 240, 361, 362, 364, 372, 375, 391, 391a, 392, 393, 399, 400, 402–414, 416, 435, 436, 451–453, 460, 461, 462, 467, 470–482, and 489–498, and the regulations issued thereunder, which are in this chapter.

(b) The mandatory provisions in Title 46, U.S. Code, section 239, govern suspension and revocation proceedings and are the basic authority therefor; while the Administrative Procedure Act (Title 5, U.S. Code, sections 1001–1011, 60 Stat. 237–244) and Title 46, U.S. Code, section 239b (P.L. 500, 83d Cong., approved July 15, 1954, 68 Stat. 484), re-

quire the hearings in such proceedings to be presided over by an examiner, before the Coast Guard may suspend or revoke a license, certificate, or document issued.

(c) Other marine safety laws and regulations in this chapter also provide authority for suspension or revocation of specific categories of licenses, certificates or documents issued by the Coast Guard or predecessor authorities. For examples, see Title 46, U.S. Code, sections 214, 224a, 226, 228, 229, 229c, 232, 234, 240, 246, 391a, 457, 526f, 672, or Title 33, U.S. Code, sections 153, 412, 435, 442, 1006.

(d) Other authority to promulgate regulations deemed appropriate to carry out the provisions of any law applicable to the Coast Guard or to issue rules, orders, and instructions, not inconsistent with law, is set forth in Title 14, U.S. Code, section 633.

§ 137.01–5 Assignment of functions.

(a) By Reorganization Plan No. 3 of 1946, effective July 16, 1946, the marine inspection functions of the former Bureau of Marine Inspection and Navigation and its officers and employees were transferred to the Commandant, United States Coast Guard. By Reorganization Plan No. 26 of 1950 (5 U.S. Code, Note under 241), effective July 31, 1950, the functions formerly vested in the Commandant, United States Coast Guard, were transferred to the Secretary of the Treasury with certain specified exceptions. The Secretary of the Treasury by a Treasury Department Order 120, dated July 31, 1950 (15 F.R. 6521), delegated to the Commandant the functions formerly performed by him under Reorganization Plan No. 3 of 1946. This included suspension or revocation of any license, certificate, or document issued by the Coast Guard or predecessor authorities under Title 46, U.S. Code, section 239. The Commandant delegates to examiners the authority to suspend or revoke any license, certificate, or document issued to a person by the Coast Guard or predecessor authorities under any navigation or vessel inspection law.

(b) The Acting Secretary of the Treasury in Treasury Department Order 167–9, dated August 3, 1954 (19 F.R. 5195), delegated to the Commandant, United States Coast Guard, the functions vested in the Secretary of the Treasury by Title 46, U.S. Code, sections 239a and 239b (P.L. 500, 83d Cong., approved July 15, 1954, 68 Stat. 484) to revoke a license, certificate, or document of a person convicted of a narcotic drug law violation or otherwise involved with narcotics. The Commandant delegates to examiners the authority to revoke a license, certificate, or document issued to a person by the Coast Guard or predecessor authorities under any navigation or vessel inspection law.

(c) The Secretary of the Treasury by Treasury Department Order 167–20, dated June 18, 1956 (21 F.R. 4894), delegated to the Commandant, United States Coast Guard, the functions vested in the Secretary of the Treasury by Title 46, U.S. Code, sections 390–390g, 404, and 526f (P.L. 519, 84th Cong., approved May 10, 1956, 70 Stat. 151–154). The Commandant delegates to examiners the authority to revoke or suspend a license issued to a person by the Coast Guard under Title 46, U.S. Code, sections 390b, 404 and 526f.

§ 137.01–10 Purpose of regulations.

(a) The regulations establish policies and procedures for remedial action (in respect to licenses, certificates and documents already issued to persons) pursuant to the authority set forth in § 137.01–1, and the regulations prescribed thereunder by the Commandant which are in this part or in Part 1 of this chapter.

§ 137.01–15 Purpose of suspension and revocation proceedings.

(a) The suspension and revocation proceedings are for the purpose of assisting in carrying out the statutory duty of the Coast Guard to promote safety of life and property. This obligation extends to the interest of passengers, crews, cargoes, shipowners and the general public.

§ 137.01–20 Nature of suspension and revocation proceedings.

(a) The suspension and revocation proceedings are remedial and not penal in nature because they are intended to maintain standards of competence and conduct essential to the purpose stated in § 137.01–15 to promote the safety of life and property at sea by insuring that the licensed or certificated persons continue to be qualified to carry out their duties and responsibilities.

§ 137.01–25 Construction of regulations.

(a) The regulations in this part shall be liberally construed so as to obtain just, speedy and economical determination of the issues presented.

§ 137.01–30 Instituting suspension and revocation proceedings.

(a) Suspension and revocation proceedings shall be instituted by an investigating officer in any case in which it appears, as a result of any investigation made under this part or Part 136, that there are reasonable grounds to believe that the holder of a license, certificate or document issued by the Coast Guard or its predecessor authorities, has:

(1) Committed an act of incompetency, misconduct, negligence, or unskillfulness while acting under the authority of his license, certificate or document; or,

(2) Endangered life while acting under the authority of his license, certificate or document; or,

(3) Willfully violated any of the provisions of title 52 of the Revised Statutes or of any of the regulations issued thereunder; or

(4) Been convicted of a narcotic drug law violation, or has been a user of or addicted to the use of a narcotic drug, so as to be subject to provisions of Title 46, U.S. Code, section 239b.

§ 137.01–35 Acting under authority of license, certificate, or document.

(a) A person employed in the service of a vessel is considered to be acting under the authority of a license, certificate or document held by him either when the holding of such license, certificate or document is required by law or regulation or is required in fact as a condition of employment. A person does not cease to act under the authority of his license, certificate or document while ashore on authorized or unauthorized shore leave from the vessel.

§ 137.01–40 Violation of law or regulation.

(a) Under Title 46, U.S. Code, section 239, suspension and revocation proceedings may be conducted, without regard to whether the person charged was in the service of a vessel at the time of the alleged offense, when the charge is a willful violation of any of the provisions of title 52 of the Revised Statutes or of any of the regulations issued thereunder.

§ 137.01–45 Violation of narcotic laws.

(a) Under Title 46, U.S. Code, section 239b, revocation proceedings may be conducted if the person charged holds a valid license, certificate or document issued by the Coast Guard or its predecessor authorities without regard to whether or not the holder was in the service of a vessel at the time of the alleged offense.

Subpart 137.02—Definitions of Terms Used

§ 137.02–1 Commandant.

(a) This term means the Commandant of the Coast Guard.

§ 137.02–5 Coast Guard District.

(a) A Coast Guard District is a geographical area which is assigned to a Coast Guard District Commander.

(b) For descriptions of the Coast Guard districts see 33 CFR Part 3.

§ 137.02–10 District Commander.

(a) This term means an Officer of the Coast Guard designated as such by the Commandant to command all Coast Guard activities within his respective district, which include the inspection, enforcement, and administration of Title 46, U.S. Code, sections 170, 214, 215, 222, 224, 224a, 226, 228, 229, 230–234, 239, 240, 361, 362, 364, 372, 375, 381, 391, 391a, 392, 393, 399, 400, 402–414, 416, 435, 436, 451–453, 460, 461, 462, 464, 467, 470–482, and 489–498, and acts amendatory thereof or supplemental thereto, and rules and regulations thereunder, except those functions of examiners under the Administrative Procedure Act (5 U.S. Code 1001–1011).

§ 137.02–15 Examiner.

(a) An examiner shall mean any person designated by the Commandant pursuant to the Administrative Procedure Act (5 U.S. Code 1001–1011) for the purpose of conducting hearings arising under Title 46, U.S. Code, section 239 or 239b.

§ 137.02–20 Investigating officer.

(a) An investigating officer is an officer or employee of the Coast Guard designated by the Commandant or the

District Commander for the purpose of making an investigation of marine casualties and accidents or other matters pertaining to the conduct of seamen. An Officer in Charge, Marine Inspection, within his assigned marine inspection zone is an investigating officer without further designation by the Commandant or the District Commander.

§ 137.02-25 Marine inspection zone.

(a) A marine inspection zone is a geographical area within a Coast Guard District which is assigned to an Officer in Charge, Marine Inspection.

(b) For descriptions of marine inspection zone boundaries see 33 CFR Part 3.

Subpart 137.03—Statements of Policy and Interpretations

§ 137.03-1 Effect of Commandant's decisions in appeal or review cases.

(a) The decisions of the Commandant in cases of appeal or review of examiners' decisions shall be officially noticed by and shall be binding upon all examiners. The examiners shall follow the principles and policies enunciated by the Commandant in such decisions unless they are modified or rejected by competent authority.

§ 137.03-3 Offenses for which revocation of licenses or documents is mandatory.

(a) Whenever a charge of misconduct by virtue of the possession, use, sale or association with narcotic drugs, including marijuana, is found proved, the examiner shall enter an order revoking all licenses, certificates and documents held by such a person.

(b) In a hearing held under Title 46, U.S. Code, section 239, on a charge of misconduct involving narcotics, whereever the person charged is shown to have had possession of the narcotic drug, such possession shall be deemed sufficient evidence to authorize the revocation of his license, certificate, or document unless other evidence explains the possession to the satisfaction of the examiner.

§ 137.03-5 Offenses for which revocation of licenses or documents is sought.

(a) The Coast Guard will initiate administrative action seeking the revocation of licenses, certificates or documents held by persons who have been involved in acts of such serious nature that permitting such persons to sail under their licenses, certificates and documents would be clearly a threat to the safety of life or property.

(b) These offenses, which are deemed to affect safety of life at sea, the welfare of seamen or the protection of property aboard ship, are:

(1) Assault with dangerous weapon (injury).

(2) Malicious destruction of ship's property.

(3) Misconduct resulting in loss of life or serious injury.

(4) Molestation of passengers.

(5) Murder or attempted murder.

(6) Mutiny.

(7) Perversion.

(8) Possession, use, sale or association with drugs, including marijuana.

(9) Sabotage.

(10) Serious neglect of duty.

(11) Serious theft of ship's property or stores.

(12) Smuggling of aliens.

§ 137.03-7 Effect of court actions.

(a) Except for the serious offenses referred to in §§ 137.03-3, 137.03-5, and 137.03-10, the Coast Guard in other situations will take into consideration court convictions when determining whether or not to initiate administrative action seeking the suspension or revocation of licenses, certificates or documents.

§ 137.03-10 Court convictions in narcotic cases.

(a) After proof of a narcotics conviction by a court of record as required by Title 46, U.S. Code, section 239b, whether or not further court action is pending, the Coast Guard may take action based upon this conviction. After proof of alleged conviction or plea of "guilty," the examiner shall enter an order revoking the seaman's licenses, certificates, and documents. A conviction becomes final when no issue of law or fact determinative of the seaman's guilt remains to be decided by the trial court.

(b) An order of revocation will be rescinded by the Commandant if the seaman submits satisfactory evidence that the court conviction on which the revocation is based has been set aside for all purposes (see § 137.20-190(b)). An order of revocation will not be rescinded as the result of the operation of any law providing for the subsequent conditional setting aside or modification of the court conviction, in the nature of the granting of clemency or other relief, after the court conviction has become final.

(c) After the conviction has become final within the meaning of paragraph (a) of this section, the conditional setting aside or modification of the conviction will not act as a bar to the subsequent revocation of a seaman's document under Title 46, U.S. Code, section 239b.

§ 137.03-15 Court of record.

(a) In the administration of Title 46, U.S. Code, section 239b, and this part, a "court of record" means a court:

(1) Which conforms with the common law principles in that it has a clerk, a seal, keeps a record of its proceedings, and has the power to fine and imprison; and,

(2) Where its proceedings are, by law or usage in the State, District of Columbia, or Territory where rendered, recognized as conclusive evidence in other courts of that jurisdiction.

§ 137.03-20 Maritime labor disputes.

(a) Under no circumstances shall the statutory machinery of the Coast Guard be used for the purpose of favoring any party to a maritime or other labor controversy. However, if a situation affecting the safety of the vessel or persons on board is presented, and a complaint in writing is lodged, the matter shall be thoroughly investigated and when a violation of existing statutes or regulations is indicated appropriate action shall be taken.

§ 137.03-25 Physician-patient privilege.

(a) For the purpose of these proceedings, the physician-patient privilege is not considered to exist between a ship's physician and a seaman employed on the same ship.

Subpart 137.05—Investigations

§ 137.05-1 Investigations made by investigating officer.

(a) Investigations will be made by an investigating officer of:

(1) All acts in violation of any of the provisions of Title 46, U.S. Code, sections 170, 214, 215, 222, 224, 224a, 226, 228, 229, 230-234, 239, 240, 361, 362, 364, 372, 375, 381, 391, 391a, 392, 393, 399, 400, 402-414, 416, 435, 436, 451-453, 460, 461, 462, 464, 467, 470-482, and 489-498, whether or not committed in connection with any marine casualty or accident; and

(2) All acts in violation of any regulation in this chapter or in 33 CFR Chapter I, whether or not committed in connection with any marine casualty or accident; and

(3) All acts of incompetency, negligence or misconduct, whether or not committed in connection with any marine casualty or accident, when committed by persons holding licenses, certificates or documents.

§ 137.05-5 Powers of investigating officer.

(a) In the conduct of an investigation, the investigating officer shall have the power to administer oaths, subpena witnesses, require persons having knowledge of the subject matter of the investigation to answer questions and require the production of relevant books, papers, documents, licenses, certificates, or other records.

§ 137.05-10 Advising person of complaint.

(a) The investigating officer conducting an investigation under this part will, where the person whose conduct is being investigated is available, advise such person informally of the substance of the complaint against him and afford him an opportunity to make such comment as he may desire.

§ 137.05-15 Courses of action available.

(a) During or at the conclusion of an investigation, the investigating officer shall take appropriate action as follows:

(1) *Prefer charges.* The investigating officer may prefer charges if he finds reasonable grounds to believe that a person holding a license, certificate or document has committed some offense or act, or has been convicted for a narcotic offense, or has failed to perform some duty, or is incompetent.

(2) *Recommend closing the case.* The investigating officer may recommend closing the case and taking no action on alleged acts if he finds that there is no:

(i) Basis for the complaint; or,

(ii) Jurisdiction; or,

(iii) Reasonable expectation that corrective measures could be accomplished.

(3) *Refer cases to others for further action.* The investigating officer may refer the case to the Commandant or to an Officer in Charge, Marine Inspection, at any port for completion of administrative action if he finds adequate basis for action and the person under investigation and/or witnesses are not then available.

(4) *Accept voluntary deposit of license, certificate or document.* The investigating officer may accept a voluntary deposit of a license, certificate or document from a person under investigation when there is evidence of physical or mental incompetence from any cause other than the use of, or addiction to narcotics.

(5) *Accept voluntary surrender of license, certificate or document.* The investigating officer may accept the voluntary surrender of a license, certificate or document when the person under investigation desires to avoid a hearing.

(6) *Give a warning.* The investigating officer may give a warning in writing to any person holding a license, certificate or document and recommend closing the case. Upon refusal to accept the written warning at the time the warning is given, it shall be withdrawn and the investigating officer may prefer charges. An unrejected warning will become a part of the person's record.

(b) When required, the investigating officer will also submit a report of investigation.

§ 137.05–17 Charges and specifications.

(a) A "charge" is a designation of an offense in general terms. The offense must be one within the purview of Title 46, U.S. Code, section 239 or 239b. A "charge" must be supported by one or more "specifications." Under no circumstances does a "charge" constitute evidence of guilt nor may any inference of guilt be drawn from the fact that the holder of a license, certificate, or document has been the subject of a "charge."

(b) A "specification" sets forth the facts which form the basis of the "charge." The purpose of a "specification" is to enable the person charged to identify the offense so that he will be in a position to prepare his defense. Each specification shall state:

(1) Basis for jurisdiction;

(2) Date and place of offense; and,

(3) A statement of the facts constituting the offense.

§ 137.05–20 Types of charges.

(a) *General.* In lieu of or supplementary to the charges described in paragraphs (b) and (c) of this section, the charges may be:

(1) *Misconduct.* "Misconduct" is a human behavior which violates some formal, duly established rule, such as the common law, the general maritime law, a ship's regulation or order, or shipping articles. In the absence of such a rule, "misconduct" is human behavior which a reasonable person would consider to constitute a failure to conform to the standard of conduct which is required in the light of all the existing facts and circumstances.

(2) *Negligence or inattention to duty.* "Negligence" and "inattention to duty" are essentially the same and cover both the aspects of misfeasance and nonfeasance. They are therefore defined as the commission of an act which a reasonably prudent person of the same station, under the same circumstances, would not commit, or the failure to perform an act which a reasonably prudent person of the same station, under the same circumstances, would not fail to perform.

(3) *Incompetence.* "Incompetence" is the inability on the part of a person to perform required duties, whether due to professional deficiencies, physical disability, mental incapacity, or any combination of same.

(b) *Violation of law or regulation.* Where the proceeding is based exclusively on that part of Title 46, U.S. Code, section 239, which refers to a willful violation of any of the provisions of title 52 of the Revised Statutes or of any of the regulations issued thereunder, the "charge" shall be "violation of statute" or "violation of regulation." The "specification" shall state the specific statute or regulation by title and section number, and the particular manner in which it was allegedly violated.

(c) *Narcotic drug law violation or use or addiction to use of narcotics.* Where the proceeding is based exclusively on the provisions of Title 46, U.S. Code, section 239b, the "charge" will be "conviction for a narcotic drug law violation" or "use of narcotics" or "addiction to use of narcotics," depending upon the circumstances. The "specification" will allege jurisdiction by stating the elements as required by Title 46, U.S. Code, sections 239 and 239b, and the approximate time and place of the offense.

§ 137.05–23 Time limitations for service of charges and specifications.

(a) The time limitations for service of various charges and specifications are as follows:

(1) For a charge and specification based exclusively on Title 46, U.S. Code, section 239b, service shall be within the time as set forth in this law; namely, 10 years after date of conviction in a court of record subsequent to July 15, 1954, or at any time if a user of or addicted to the use of a narcotic drug after July 15, 1954.

(2) For a charge and specification describing one of the more serious types of offenses specified in § 137.03–5, service shall be within five years after the commission of the offense alleged therein.

(3) For a charge and specification describing an offense not otherwise provided for, the service shall be within three years after the commission of the offense alleged therein.

(b) When computing the period of time specified in this section there shall be excluded any period or periods of time when the person could not attend a hearing by reason of being in a foreign country or by reason of being in prison or asylum.

§ 137.05–25 Procedure preparatory to hearing.

(a) To institute hearing proceedings preparatory to hearing, the investigating officer shall prepare charges and specifications, as required, together with a notice of the time and place of the hearing.

(b) The notice of the time and place of the hearing and the original of the charges and specifications shall be served upon the person charged, either by personal service or by certified mail with return receipt requested, notice to be signed by the addressee only.

(c) When service is by mail, it shall be sufficiently in advance of the time set for the hearing so as to give the person charged a reasonable opportunity to prepare his defense.

(d) When service is made personally upon the person charged, the person making such service shall give the original of the notice of the hearing, the charges and the specifications to the person charged, shall read them to such person if he cannot read, and shall make a record of the time and date of service. When personal service is made, the written acceptance on the reverse side of the form containing the charges and specifications shall be sufficient to show service as of the date on the face of the form unless otherwise indicated by separate notation thereon by the person effecting such service.

(e) Further, at the time of such service, whether personal or by registered mail, the person charged will be also advised with respect to:

(1) The nature of suspension and revocation proceedings and the possible results thereof.

(2) His right to have counsel represent him at the hearing, and that counsel may be a lawyer or any other person he desires to represent him.

(3) His right to have witnesses and/or records subpenaed in his behalf.

(f) If the offense alleged involves mental incompetence, the person charged shall be advised (when the service of the charge and specification and notice of hearing is made) to procure counsel to represent him.

§ 137.05–30 Evidence of criminal liability.

(a) If, as a result of any investigation, evidence of criminal liability on the part of any holder of a license, certificate or document, or any other person is found, such evidence shall be referred to the Attorney General, or his local representative.

(b) The investigating officer shall determine whether to institute suspension and revocation proceedings under Title 46, U.S. Code, section 239 or 239b, for use or addiction to the use of narcotics, before criminal action may be initiated or completed against the holder of a license, certificate or document, or to defer instituting such proceedings pending the outcome of the criminal action in a Federal or State court. One controlling

factor will be whether or not the witnesses will be available if the hearing is delayed.

Subpart 137.10—Deposit or Surrender of License, Certificate or Document

§ 137.10–1 Voluntary deposit in event of mental or physical incompetence.

(a) A person may deposit his license, certificate or document with an investigating officer in any case where there is evidence of mental or physical incompetence for any reason other than when caused by use of, or addiction to, narcotics.

(b) A voluntary deposit is accepted on the basis of a written agreement which specifies the conditions accompanying the deposit. The original or a copy will be given to the person making the deposit. The Coast Guard agrees to return the license, certificate or document deposited by the person described therein when he obtains a certificate from the U.S. Public Health Service, or other authorized medical officer showing the person is considered to be fit for sea duty.

(c) Where the mental or physical incompetence of a holder of a license, certificate or document is caused by use of, or addiction to, narcotics, such person may only surrender such license, certificate or document in accordance with § 137.10–10.

§ 137.10–10 Voluntary surrender to avoid hearing.

(a) Any person may surrender his license, certificate or document to an investigating officer in preference to appearing at a hearing.

(b) Whenever a person voluntarily surrenders his license, certificate or document, he shall sign a written statement containing the following stipulations that:

(1) This surrender is made voluntarily in preference to appearing at a hearing;

(2) All title to the license, certificate or document surrendered is permanently relinquished; and,

(3) His rights with respect to a hearing, appeal, and review are waived.

(c) A voluntary surrender of a license, certificate or document to an investigating officer in preference to appearing at a hearing should not be accepted by an investigating officer unless the investigating officer is convinced that the seaman fully realizes the effect of such surrender.

Subpart 137.13—Issuance of New Licenses, Certificates or Documents After Revocation or Surrender

§ 137.13–1 Time limitations.

(a) Any person whose license, certificate or document has been revoked or surrendered for one or more of the offenses described in §§ 137.03–3, 137.03–5, and 137.03–10, or for mental or physical incompetence resulting from use of, or addiction to, narcotics may after three years apply by letter and the application form requesting the issuance of a new license, certificate or document.

(b) Any person whose license, certificate or document has been revoked or surrendered for one or more offenses which are not specifically described in §§ 137.03–3 and 137.03–5 may after one year apply by letter and the application form requesting the issuance of a new license, certificate or document.

§ 137.13–5 Application.

(a) The letter and application shall be addressed to the Commandant, U.S. Coast Guard, Washington, D.C., 20226, but should be filed in person with the nearest Officer in Charge, Marine Inspection, since this officer will submit a preliminary evaluation and recommendation.

(b) The letter shall be an informal request for the issuance of a new license, certificate or document and shall transmit the following:

(1) A letter from each employer during time applicant was without a license or document, stating dates of employment and attesting to the satisfactory work record. (Times or periods of unemployment shall be satisfactorily explained in the letter.)

(2) At least three character references from responsible persons and stating how long they have known him.

(c) The Officer in Charge, Marine Inspection, will forward the letter and application, together with a preliminary evaluation and recommendation, to the Commandant.

§ 137.13–10 Commandant's decision on application.

(a) Every letter and application received, as well as the preliminary evaluation and recommendation of an Officer in Charge, Marine Inspection, will be referred to a special board appointed by the Commandant. The board will examine all the material submitted with the application and such other information as may, in the judgment of the board, be considered necessary. The board shall submit its findings and recommendations to the Commandant.

(b) The Commandant shall determine whether or not the issuance of a new license, certificate or document shall be made.

Subpart 137.15—Subpenas and Service of Process

§ 137.15–1 Authority for subpenas.

(a) There is delegated to investigating officers and examiners authority to issue subpenas under Title 46, U.S. Code, section 239, to command attendance of witnesses or the production of books, papers, documents, or any other evidence necessary.

§ 137.15–5 Form of subpena.

(a) Every subpena shall bear at least the name "United States Coast Guard", the word "subpena", and local Coast Guard address from which issued. It may be a letter or Form CG–2639B.

(b) Every subpena shall command the person to whom it is directed to attend at a specified time and place to give testimony or to produce books, papers, documents, or any other evidence, which shall be described with such particularity as necessary to identify what is desired.

§ 137.15–10 Issuance of subpenas.

(a) During the investigation and prior to the hearing, the investigating officer shall issue subpenas for the attendance of witnesses or for the production of books, papers, documents, or any other relevant evidence that he may need or that may be needed by the person charged.

(b) During the hearing, the examiner shall issue subpenas for the attendance and the giving of testimony by witnesses or for the production of books, papers, documents, or any other relevant evidence, either upon his own motion or upon a request of either of the parties.

§ 137.15–15 Service of subpenas.

(a) Any person capable of reading and writing may serve a subpena upon the person named therein. Service of a subpena upon a person named therein shall be made by delivering such subpena to such person by personal service, or by certified mail with return receipt to be signed by the addressee only.

(b) The investigating officer shall serve or have served every subpena that he issues in his own behalf, or on behalf of the person charged when feasible.

(c) The person charged or his counsel is responsible for serving subpenas issued at his request by an examiner. However, if the examiner finds that the person charged or his counsel is physically unable to effect the service, despite diligent and bona fide attempts to do so, and if the examiner further finds that the existing impediment to the services of the subpena is peculiarly within the authority of the Coast Guard to overcome, the examiner will have the subpena delivered to such person as the District Commander may designate for the purpose of effecting service.

§ 137.15–20 Proof of service.

(a) The person serving a subpena shall make a written statement setting forth the date, time and manner of service and shall return such report with or on a copy of the subpena to the investigating officer or examiner who issued it. In case of failure to make service of a subpena, the person assigned to serve such subpena shall make a written statement setting forth the reasons, which statement should be on the subpena or attached to it.

(b) When service of a subpena is made by certified mail with return receipt to be signed by the addressee only, the person mailing the subpena shall make a written statement on a copy of the subpena or attached to it, setting forth the date, time and place of Post Office where mailed, and Post Office number assigned thereto. If delivered, the receipt requested shall be returned to the investigating officer or examiner who issued the subpena. In case the subpena is not delivered, any information reported by the Post Office regarding non-delivery shall be given to the in-

vestigating officer or examiner who issued the subpena.

§ 137.15–25 Quashing a subpena.

(a) The person to whom a subpena is directed may, prior to or during the hearing, apply in writing to the examiner conducting the hearing a request that the subpena be quashed or modified. The examiner will notify the party for whom the subpena was issued.

(b) The examiner shall rule on the matter promptly. He may quash the subpena if it is unreasonable or requires evidence not relevant to any matter in issue, or he may deny the request.

§ 137.15–30 Enforcement.

(a) Upon application and for good cause shown, or upon its own initiative, the Coast Guard will seek judicial enforcement of subpenas issued by investigating officers or examiners. This may be done by making application to the United States District Court to issue an order compelling the attendance of, and/or the giving of testimony by, witnesses.

Subpart 137.17—Witness Fees

§ 137.17–1 Witness's request for payment of fees.

(a) Duly subpenaed witnesses, other than government employees, may apply for payment for their services as witnesses by submitting a request for payment (Standard Form No. 1157) to the examiner presiding over the hearing or to the investigating officer (28 U.S. Code, section 1821). The examiner or investigating officer will forward the request to the Coast Guard authorized certifying officer together with a statement that:

(1) The witness seeking payment was duly subpenaed as a witness by the Coast Guard;

(2) The witness appeared pursuant to such subpena, the name of the person charged or under investigation, and the name of city and state where investigation or hearing was held; and,

(3) The witness is entitled to witness fees, and/or subsistence, and/or mileage allowance claimed.

(b) Upon receipt of the witness's claim (Standard Form 1157) with supporting statement, the Coast Guard authorized certifying officer may certify to the propriety of the claim according to the scale of fees, subsistence, and mileage in § 137.17–5, and submit it to the appropriate disbursing officer for payment.

(c) Government employees who are witnesses at a hearing or investigation may be paid travel expenses as provided by the Standardized Government Travel Regulations. Coast Guard personnel may be paid travel expenses as provided in the Coast Guard Travel Manual.

§ 137.17–5 Scale of fees, subsistence, and mileage.

(a) A subpenaed witness may be paid a fee of $4.00 for each day or fraction thereof of attendance and for time necessarily occupied in going to and returning from the place of hearing or investigation (28 U.S. Code, section 1821). A witness called to testify as an expert may be paid a higher fee provided such higher fee is approved by the Commandant prior to his appearance.

(b) A subsistence allowance of $8.00 for each day or fraction thereof may be paid if the subpenaed witness resides at a distance so far removed from the place at which the hearing or investigation was held so as to prohibit his returning to his place of residence each day, and if such witness was required to remain at the place where the hearing or investigation was held for more than one day. In a case where subsistence allowance is payable under this paragraph and the subpenaed witness is required to travel, a subsistence allowance of $8.00 per day may be paid for each day necessarily occupied in traveling from the place of residence to attend the hearing or investigation and return to such place: *Provided*, That no subsistence allowance for travel time shall be paid if the witness is already present at place of investigation or hearing at time of service of subpena.

(c) In computing the witness fee or the subsistence allowance, a fraction of a day will be considered as a whole day, the day will be considered as consisting of 24 hours, and a day will be regarded as beginning on the hour at which the witness had to leave his residence in order to arrive at the appointed time at the place where the investigation or hearing was held. After dismissal, the witness is assumed to leave the place of the investigation or hearing for his residence by the first available transportation, and the period of time will be terminated at the time of arrival at his residence.

(d) Travel money at the rate of 8 cents per mile, not to exceed 100 miles, for actual travel from place of residence or place where subpena was served to place at which the investigation or hearing was held may be paid to a subpenaed witness. Travel money at the rate of 8 cents per mile, not to exceed 100 miles, is also allowed for the actual travel involved in return of witness to his place of residence, or if the subpena was served at a place other than the witness's place of residence, to the place where said subpena was served. All payments of travel money shall be computed on the basis of mileage by the shortest route. When a witness is furnished transportation by the Government, no mileage allowance is authorized. If a witness is unable to furnish funds for transportation charges, Government transportation requests may be issued for his transportation, at the lowest first class rate available, to and from the place of hearing, in which case the mileage allowance is not authorized. When two or more witnesses are transported at the same time in the privately owned vehicle, operated by one of the witnesses, the mileage allowance for only one witness is authorized.

(e) The fees provided in paragraphs (a), (b), and (d) of this section shall not apply in Alaska. In Alaska subpenaed witnesses are entitled to the fees, subsistence, and mileage allowances to the same extent as may be prescribed for witnesses before the United States District Court in the judicial division in which the hearing is held. (See 28 CFR 21.3 for schedule of fees and allowances of witnesses in the District of Alaska.)

(f) In the case of employed merchant marine personnel their place of residence will be construed to be the vessel upon which they are employed, and in the case of unemployed merchant marine personnel their place of residence will be construed to be their actual place of residence when ashore at time of the investigation or hearing rather than the residence of their next of kin.

Subpart 137.20—Hearings

§ 137.20–1 General.

(a) A hearing in a suspension and revocation proceeding conducted under Title 46, U.S. Code, section 239 or 239b, is the adjudication of the case. It is presided over and is conducted under the exclusive administrative control of a civilian examiner in accordance with applicable requirements in Title 5, U.S. Code, sections 1001–1011, inclusive (Administrative Procedure Act), and the regulations in this part. The examiner shall regulate and conduct the hearing in such a manner so as to bring out all the relevant and material facts, and to insure a fair and impartial hearing.

(b) An examiner shall not consult with any one concerning any fact in issue in a suspension and revocation proceeding unless, after notice, all parties are permitted to participate. An examiner shall not informally obtain advice or opinions from the parties or their counsel or from any officer or employee of the Coast Guard as to the weight or interpretation to be given to evidence. The examiner may at any time consult with or receive instructions from the Commandant.

(c) The procedure usually followed in a hearing is:

(1) Examiner's opening statement.

(2) Appearances of persons at the hearing.

(3) Verification of currently valid license, certificate and/or document held by person charged.

(4) Examiner advises person charged of his rights.

(5) Exclusion of witnesses from the hearing room.

(6) Preliminary motions, objections and/or corrections to the charges and specifications.

(7) Arraignment and plea of person charged.

(8) Opening statement of investigating officer.

(9) Opening statement by or on behalf of person charged or statement in mitigation if there has been a "guilty" plea.

(10) Submission of evidence.

(11) Argument by the investigating officer and argument by or on behalf of the person charged.

(12) Submission of proposed findings and conclusions by the investigating officer and/or by or on behalf of the person charged.

(13) Findings and conclusions of the examiner.

(14) Prior record of the person charged.
(15) The complete decision of the examiner.
(16) Service of the order or complete decision.
(17) Obtain or return the license, certificate or document, as appropriate.
(18) Advise the person charged of his right of appeal.
(19) Examiner's declaration that the hearing is closed.

§ 137.20–5 Public access to hearings.

(a) Every hearing conducted by an examiner shall be open to the public except when the examiner finds that subject matter to be or being brought out in the evidence concerns classified matter relating to national security, or when other circumstances exist which court decisions have held to warrant a limitation or exception to the right of a public hearing.

(b) Representatives of the press shall not be excluded from a hearing unless the hearing concerns classified matter relating to national security.

§ 137.20–10 Continuance of a hearing.

(a) The examiner may, for good cause to be shown in the record, either on his own motion or the motion of the investigating officer or person charged, continue the hearing from day to day or adjourn such hearing to a later date or to a different place by announcement at the hearing or by other appropriate notice. In making such determination, consistent with the rights of the person charged to a fair and impartial hearing, the examiner shall give careful consideration to the future availability of witnesses and to the prompt dispatch of the vessel or vessels on which the person charged and/or witnesses may be employed.

§ 137.20–15 Disqualification of examiner.

(a) In any suspension and revocation proceeding conducted under this part, an examiner may withdraw voluntarily from a particular case when he deems himself unqualified. In such event the examiner shall immediately notify the Commandant of his desire to withdraw and his reasons.

(b) In any case the person charged or the investigating officer may, in good faith, request the examiner to withdraw on the grounds of personal bias or other disqualification. The person seeking the examiner's disqualification shall file with the examiner a timely affidavit or statement sworn to before a Coast Guard officer or official authorized to administer oaths setting forth in detail the facts alleged to constitute the grounds for disqualification. The examiner may file a response thereto and shall rule whether or not he considers himself disqualified.

(c) If the person seeking disqualification takes exception to the ruling of the examiner, he may appeal such ruling to the Commandant. The examiner shall immediately forward the affidavit or sworn statement with his decision. If the examiner believes himself not disqualified and he so rules, the examiner shall also have all matters relating to such claims of disqualification affirmatively appear in the record. The examiner shall then proceed with the hearing unless it can be shown that a delay in the hearing pending a determination of the appeal will not interfere with the future availability of the person charged and witnesses, or the prompt dispatch of the vessel or vessels on which the person charged and/or witnesses may be employed.

§ 137.20–25 Failure of person charged to appear at hearing.

(a) In any case in which the person charged, after being duly served with the original of the notice of the time and place of the hearing and the charges and specifications, fails to appear at the time and place specified for the hearing, a notation to that effect shall be made in the record and the hearing may then be conducted "in absentia."

(b) The examiner shall also cause to be placed in the record all the facts concerning the issuance and service of the notice of hearing and the charges and specifications.

§ 137.20–27 Person charged may be required to submit to medical examination.

(a) In a hearing in which the physical or mental condition of the person charged is in controversy, the examiner on his own motion may order the person charged to submit to a medical examination, or the investigating officer may submit a written petition requesting such person to be required to submit to a medical examination by a physician. The examiner shall decide from the evidence or information submitted to him by the investigating officer whether or not to order the person charged to submit to an examination before a physician of the U.S. Public Health Service, and also to an examination before another physician if the person charged so desires and pays for the required examination.

(b) If the person named in the examiner's order fails or refuses to submit to such duly ordered examination, such failure shall receive due weight in determining the facts alleged in the specifications.

§ 137.20–30 Time and place of hearing.

(a) The hearing shall be held at the time and place specified in the notice of the hearing served upon the person charged by or under the direction of the investigating officer.

§ 137.20–35 Opening the hearing.

(a) The examiner shall open the hearing at the time and place specified in the notice, administer all necessary oaths, and cause a complete record of the proceedings to be kept.

(b) The examiner shall open the hearing with appropriate identification of the proceeding and announce the statutory jurisdiction under which the hearing is being conducted. The examiner shall describe the nature of the proceedings and state that it is concerned solely with the rights of the person charged to continue holding specific license, certificate, and/or document, and any endorsement thereon, as the case may be, issued by the Coast Guard or by any predecessor authority.

§ 137.20–37 Appearances.

(a) The appearances of persons at the hearing shall be entered in the following order:
(1) The investigating officer;
(2) The person charged; and,
(3) The counsel for the person charged, if any.

§ 137.20–40 Verification of license, certificate or document.

(a) Since the proceeding involves a license, certificate or document issued by the Coast Guard, the examiner shall require the person charged to produce and present to him at the opening of the hearing and on each day the hearing is in session thereafter, all valid licenses, certificates, and/or documents issued to the person charged. In the event that the person charged alleges he has lost any such license, certificate or document, the examiner shall require the person charged to execute a lost document affidavit (Form CG–719E). The examiner shall warn the person charged that a willful misstatement of any material item in such affidavit is punishable as a violation of a federal criminal statute.

(b) When a hearing is continued or delayed, the examiner shall return the license, certificate, and/or document to the person charged upon demand: *Provided*, That such action shall not be taken if a prima facie case has been established that the person charged committed an offense which shows that he has such propensities and proclivities as to constitute a definite danger to the safety of life or property at sea.

§ 137.20–45 Rights of person charged.

(a) The examiner shall advise the person charged of his rights to:
(1) Be represented by professional counsel, or any other person he may desire;
(2) Have witnesses and relevant evidence subpenaed;
(3) Examine witnesses, cross-examine witnesses testifying against him, and introduce relevant evidence into the record; and,
(4) Testify in his own behalf or remain silent.

(b) All matters on which the examiner is required to advise the person charged shall affirmatively appear in the record.

§ 137.20–60 Witnesses excluded from hearing room.

(a) All witnesses shall be excluded from the hearing room prior to the taking of their testimony and the examiner may separate government witnesses if he deems it desirable.

§ 137.20–63 Preliminary motions or objections.

(a) Any preliminary motion or objection shall be heard and disposed of by the examiner.

§ 137.20–65 Correction or amendment of charges and/or specifications.

(a) The examiner shall examine the charges and specifications to determine their correctness as to form and legal sufficiency.

(b) The examiner may, on his own motion or the motion of the investigating officer or person charged, permit the amendment of charges and specifications to correct harmless errors by deletion or substitution of words or figures: *Provided*, That a legal specification is left remaining. Broad and liberal discretion shall be exercised by examiners in permitting such amendments.

(c) When errors of substance are found in charges and specifications, the examiner shall rule that the defective charge or specification is withdrawn. The investigating officer may then prepare and serve a new charge and specification on the person charged.

§ 137.20–75 Arraignment and plea.

(a) The examiner shall read each charge and specification to the person charged and shall obtain from him or counsel a definite plea to each charge and specification. If the person charged does not make a definite plea, the examiner shall enter a plea of "not guilty" and proceed with the hearing.

(b) If the person charged fails to appear at the hearing, the examiner will comply with the procedures in § 137.20–25. If no valid reason to the contrary appears, the examiner shall enter pleas of "not guilty" to all the charges and specifications, and shall then proceed with the hearing.

§ 137.20–77 Burden of proof.

(a) The investigating officer has the burden of proof and shall present his evidence first.

§ 137.20–80 Opening statement of investigating officer.

(a) If the person charged pleads "not guilty," the investigating officer shall make a brief statement outlining the basis for the preferment of the charges; particulars incident to the substance of the complaint; and a summary of matters expected to be proved.

(b) If the person charged pleads "guilty," the opening statement of the investigating officer shall contain a summary of the evidence upon which the charge and specification are based.

§ 137.20–85 Opening statement by or on behalf of the person charged.

(a) The person charged or his counsel shall be afforded an opportunity to state what he intends to establish. This may be waived or deferred at the option of the person charged.

(b) If the person charged pleads "guilty," he may present evidence or mitigating circumstances believed to be material. Should this presentation be inconsistent with a "guilty" plea, the examiner shall reject the plea, change the plea to "not guilty" and proceed with the hearing.

§ 137.20–87 Coercion of witnesses.

(a) Any attempt to coerce any witness or to induce him to testify falsely, is an offense which may be punishable by fine of $5,000 or imprisonment for 5 years, or both fine and imprisonment. (See 18 U.S.C. 1505, 46 U.S.C. 239.)

§ 137.20–90 Witnesses.

(a) All witnesses shall be sworn, duly examined, and may be cross examined. At any time a witness is on the stand he may be questioned by an examiner.

(b) The investigating officer or person charged who calls a witness shall begin his direct examination by identifying the witness. When possible, the witness will be required to identify the person charged.

(c) In any case where the person charged has entered a "guilty" plea, witnesses may be called to establish matters of aggravation or matters of mitigation.

§ 137.20–93 Witness's personal counsel.

(a) Any witness may have personal counsel to advise him as to his rights, but such counsel may not otherwise participate in the hearing.

§ 137.20–95 Evidence.

(a) In these administrative proceedings, strict adherence to the rules of evidence observed in courts is not required. All relevant and material evidence, oral or written, shall be received except that hearsay evidence shall be rejected if the declarant is readily available to appear as a witness. In deciding whether the declarant's testimony should be obtained, the importance of such evidence shall be balanced against the difficulty of producing the witness. Hearsay evidence shall be accorded such weight as the circumstances warrant, including consideration of whether it is opposed by other evidence. Irrelevant, immaterial and unduly repetitious evidence should be excluded.

(b) Findings must be supported by substantial evidence of a reliable and probative character. By this is meant evidence of such probative value as a reasonably prudent and responsible person is accustomed to rely on when making decisions in important matters. It is not limited to evidence which is considered to be competent evidence for the purpose of admissibility under the jury-trial rules.

(c) In conducting a hearing the examiner will extend reasonable latitude to the person charged who does not have professional counsel to represent him. Investigating officers and counsel should be required to conform to the rules of evidence to a greater degree than persons charged without counsel.

§ 137.20–100 Documentary evidence generally.

(a) Except as modified by the regulations in this part, documentary evidence shall be admissible in accordance with the applicable rules of evidence, as set forth in § 137.20–95.

§ 137.20–102 Official notice by Commandant and examiners.

(a) The Commandant and the examiners shall consider the following without requiring the person charged or the Coast Guard to submit them in evidence:

(1) *Federal law.* The Constitution; Congressional Acts, Resolutions, Records, Journals and Committee Reports; Decisions of Federal Courts; Executive Orders and Proclamations; and all rules, regulations, orders and notices published by the Treasury Department or United States Coast Guard in the FEDERAL REGISTER.

(2) *State law.* The Constitution and public laws of each State.

(3) *Governmental organizations.* The organization, territorial limitations, officers, departments, and general administration of the Government of the United States, its territories, possessions, and the Commonwealth of Puerto Rico; the several States; and foreign nations.

(4) *Coast Guard organization.* The Coast Guard's organization, administration, officers, personnel, and official publications pertaining to organization.

(5) *Commandant's decisions.* The Commandant's decisions in all appeal and review cases under this part. (See § 137.03–1.)

(b) The Commandant and examiners may, upon request, take official notice of those matters of which the courts usually take judicial notice, and matters which adjudicated cases recognize may be officially noticed by administrative agencies. However, the matters thus officially noticed by the examiner shall be specified on the record. Either party shall be afforded an opportunity, on the record, to rebut such matters.

§ 137.20–105 Certification of court records.

(a) A copy of a court record, such as the court conviction or judgment, shall be certified to be a true copy by the clerk or deputy clerk of the court and under the seal of the court, with or without the certification of the judge that the attestation by the clerk is in proper form.

§ 137.20–106 Certification of extracts from shipping articles, logbooks, etc.

(a) Extracts from records in the custody of the Coast Guard, shipping articles, and logbooks, shall be certified by an investigating officer or custodian of such records.

(b) Any commissioned officer of the Coast Guard is authorized to certify extracts from Coast Guard records, shipping articles, and logbooks as being true copies of the original by certifying that he has seen the original and compared the copy with it and found it to be a true copy. The officer so certifying shall subscribe his name, rank, and duty station.

§ 137.20–107 Admissibility and weight of entries from Official Logbooks.

(a) The Official Logbook of a vessel, or a duly certified copy of an entry made

therein, shall be admissible in evidence, under authority of Title 28, U.S. Code, section 1732.

(b) An entry in an Official Logbook of a vessel made in substantial compliance with the requirements of Title 46, U.S. Code, section 702, in addition to being admissible in evidence, shall constitute prima facie evidence of the facts therein recited. However, an entry not made in substantial compliance with the requirements of Title 46, U.S. Code, section 702, while admissible in evidence, does not constitute prima facie evidence of the facts therein recited.

§ 137.20–110 Use of judgments of conviction.

(a) The judgment of conviction by a Federal court is conclusive in proceedings under Title 46, U.S. Code, section 239, where acts forming the basis of the charges in a Federal court are the same. The person charged may not challenge the jurisdiction of a Federal or State court in proceedings under Title 46, U.S. Code, sections 239 and 239b.

(b) Where the acts involved in a judgment of conviction of a State court are the same as those involved in proceedings under Title 46, U.S. Code, section 239, the judgment of conviction is not conclusive of the issues decided. However, such judgment of conviction is admissible in evidence in the latter proceedings and constitutes substantial evidence adverse to the person charged.

(c) The judgment of conviction for a narcotic drug law violation by a Federal court or a State court of record is conclusive in proceedings under Title 46, U.S. Code, section 239b.

§ 137.20–115 Admissibility of reports of consul.

(a) The original or a duly authenticated copy of a report made by a consul or a vice consul of the United States shall be admissible in evidence.

§ 137.20–117 Admissibility of records of proceedings at Coast Guard investigations.

(a) The records of proceedings at Coast Guard investigations, including testimony and statements of witnesses and all exhibits received, are admissible in hearings conducted under this part, pursuant to stipulation by the investigating officer and the person charged.

(b) The stipulation shall be in writing, shall describe the specific portions of the record to be submitted as evidence, and shall be signed by the investigating officer and the person charged or his counsel. The stipulation and the portions of the records referred to therein shall upon presentation be made a part of the record of the hearing.

§ 137.20–118 Admissibility of seaman's Coast Guard records.

(a) The prior negative disciplinary record of the person charged is admissible as character evidence of his general good reputation.

(b) A commendatory record pertaining to the specific trait of character in question is admissible.

(c) No part of a prior disciplinary record may be used to show particular acts in order to refute directly evidence as to the good character of the person charged. However, it is admissible for the limited purposes of:

(1) Impeaching the credibility of the person charged on cross-examination after he has testified, on direct examination, that he has no prior disciplinary record.

(2) Impeaching the credibility of the person charged by showing offenses of such a nature as to indicate his general lack of veracity.

(3) Testing the qualifications of character witnesses who express opinions concerning the general good reputation of the person charged.

(4) Proving prior conduct tending to show guilty knowledge, design, intent, motive, or the like, which is relevant to the offense alleged.

§ 137.20–120 Admissions by person charged during a Coast Guard investigation.

(a) No person shall be permitted to testify with respect to admissions made by the person charged during or in the course of a Coast Guard investigation except for the purpose of impeachment.

§ 137.20–125 Other admissions by person charged.

(a) Any person other than a Coast Guard investigating officer may testify as to admissions voluntarily made by the person charged in the presence of the witness other than during or in the course of an investigation by the Coast Guard.

§ 137.20–130 Impeachment of witnesses.

(a) A witness, including the person charged if he voluntarily testifies in his own behalf, may be impeached by proof of prior inconsistent statements, whether oral or written, which were made by him. However, before evidence of such inconsistent statements is admissible in evidence, a proper foundation must be established.

(b) Evidence of prior inconsistent statements by a witness is admissible for the limited purpose of impeaching the credibility of the witness.

(c) A party calling a witness or otherwise making a witness his own may, after orally pleading surprise, be permitted to impeach him in the discretion of the examiner.

§ 137.20–135 Testimony of absent witnesses.

(a) The testimony of a witness other than the person charged taken under oath during a Coast Guard investigation may be received in evidence in lieu of the appearance of the witness when it is established to the satisfaction of the examiner that:

(1) Whereabouts of the witness is unknown after diligent search; or,

(2) Witness is non compos mentis; or,

(3) Witness is deceased; or,

(4) Witness is ill or incapacitated to such an extent that neither his testimony nor a deposition can be taken; or,

(5) Witness is more than 100 miles from the place of hearing and at a place so remote and inaccessible as to make it impracticable to take his deposition.

(b) In considering the admissibility and credibility of the testimony taken under oath during an investigation and offered in evidence under paragraph (a) of this section, the examiner shall consider the apparent trustworthiness of the testimony, and shall take into consideration whether or not the parties were represented or afforded the right to be present and to cross examine the witness.

§ 137.20–140 Testimony by deposition.

(a) Testimony may be taken by deposition upon application, and for good cause shown, by any party or upon the initiative of the examiner.

(b) The application to the examiner shall be in writing, setting forth the reasons why it should be taken, the name and address of the witness, the matters concerning which it is expected the witness will testify, the time and place proposed for the taking of the deposition and whether it shall be by oral examination or written interrogatories.

(c) The examiner will for good cause shown, serve upon the parties an order specifying the name of the witness, the time and place for taking the deposition, and a designation of a person before whom the witness is to testify. Such deposition may be taken before any person authorized to administer oaths.

(d) The party desiring a deposition by written interrogatories shall submit a list of interrogatories to be propounded to the absent witness; then the opposite party after he has been allowed a reasonable time for this purpose, may submit a list of cross-interrogatories. If either party objects to any question, the matter shall be presented to the examiner for a ruling. Upon agreement of the parties on a list of interrogatories and cross-interrogatories (if any) the examiner may propound additional questions.

(e) The subpena referred to in Subpart 137.15, of this part together with the list of interrogatories and cross-interrogatories (if any), shall be forwarded to the person designated to take such deposition. This person will cause the subpena to be served personally on the witness, and a copy shall be endorsed and returned to the examiner.

(f) When the deposition has been transcribed, it shall be presented to the witness for examination and correction and then shall be subscribed by him. The person taking the deposition shall certify the signature of the witness. If for any reason the deposition or interrogatory is not subscribed by the witness, then the person taking the deposition shall recite under oath thereon the reason it is not subscribed.

(g) When the deposition has been duly executed it shall be returned to the examiner. As soon as practicable after the receipt of the deposition the examiner shall present it to the parties for their examination. The examiner shall rule on the admissibility of the deposition or any part thereof and on any objections.

(h) In the event one party files interrogatories, the other party, in lieu of filing cross-interrogatories, may attend the taking of the deposition and cross-examine the witness.

§ 137.20–145 Argument.

(a) After all the evidence has been presented the parties may present oral and/or written argument in the following order:

(1) Opening argument by the investigating officer;

(2) Argument by the person charged or his counsel; and,

(3) Closing argument by the investigating officer.

§ 137.20–150 Submission of proposed findings and conclusions.

(a) The examiner shall afford the investigating officer and the person charged reasonable opportunity to submit, either orally or in writing, proposed findings and conclusions with supporting reasons. If either party desires to submit such matter, the examiner shall fix the time within which it shall be filed. Failure to comply within the time so fixed by the examiner shall be regarded as a waiver of the right.

§ 137.20–155 Examiner's decision.

(a) The examiner shall render a decision consisting of:

(1) "Findings of Fact," including necessary evidentiary and ultimate facts pertaining to each specification;

(2) "Conclusions" as to whether or not the charges and specifications are found proved;

(3) "Rulings" on proposed findings and conclusions;

(4) "Opinion," discussing the reasons, precedents, legal authorities, or other basis for the findings, conclusions and order on all material issues of fact, law, or discretion, with such specificity as to advise the parties of their record and legal basis; and,

(5) "Order," reciting disposition of the case. The order is only given after consideration of the prior record of the person charged as provided in § 137.20–160.

(b) A separate conclusion shall be made by the examiner on each charge and specification. A specification may alternately be found "not proved," "proved in part," "proved," or "proved by plea."

§ 137.20–160 Prior record.

(a) Except as provided for in § 137.20–118, the prior commendatory and/or disciplinary record of the person charged will not be disclosed to the examiner until after he has made the conclusions as to each charge and specification, and then only if at least one charge has been found "proved."

(b) In order to expedite the examiner's decision, if prior record is not available at the hearing, the person charged, if he consents, may be questioned under oath as to his prior record. Erroneous information given by the person charged shall be grounds for the examiner to reopen the case and amend his order.

§ 137.20–165 Table of average orders.

(a) The Table 137.20–165 is for the information and guidance of examiners. The orders listed for the various offenses are average only and should not in any manner affect the fair and impartial adjudication of each case on its individual facts and merits.

(b) The Table 137.20–165 is divided into seven groups. In the table, the first numeral indicates the period of suspension in months and when followed by a zero means an outright suspension. For example, 1–0 means a one-month suspension without probation. Where the first numeral is followed by a numeral other than zero, a probationary suspension is indicated. For example, 6–12 means a six-month suspension, with a twelve-month period of probation.

TABLE 137.20–165—SCALE OF AVERAGE ORDERS

Type of Offense	Number of times committed				
	First	Second	Third	Fourth	Fifth
Group A (1) (offenses committed within 3 years are to be considered as repeated):					
Absent over leave	[1] Adm.	1–0	3–0	6–0	[2] Rev.
Absent without leave	Adm.	1–0	3–0	6–0	Rev.
Failure to join (domestic)	Adm.	1–0	3–0	6–0	Rev.
Inattention to duty (unintentional)	Adm.	1–0	3–0	6–0	Rev.
Violation of a regulation (unintentional)	Adm.	1–0	3–0	6–0	Rev.
Group A (2) (offenses committed within 3 years are to be considered as repeated):					
Creating a disturbance aboard ship due to intoxication	Adm.	2–0	4–0	Rev.	----------
Failure to join (foreign)	Adm.	2–0	4–0	Rev.	----------
Failure to perform duty	Adm.	2–0	4–0	Rev.	----------
Group B (time between offenses not to have any bearing when considering whether man is repeater):					
Attempt to illegally take or smuggle property ashore	6–12	6–0	Rev.	----------	----------
Desertion (domestic)	6–12	6–0	Rev.	----------	----------
Failure to report marine casualty	6–12	6–0	Rev.	----------	----------
Failure to manifest	6–12	6–0	Rev.	----------	----------
Neglect of duty	6–12	6–0	Rev.	----------	----------
Possession of intoxicating liquor	6–12	6–0	Rev.	----------	----------
Possession of firearms	6–12	6–0	Rev.	----------	----------
Sleeping on watch	6–12	6–0	Rev.	----------	----------
Use of profane and threatening language to superior	6–12	6–0	Rev.	----------	----------
Violation of a regulation (intentional)	6–12	6–0	Rev.	----------	----------
Wilful disobedience of a lawful order	6–12	6–0	Rev.	----------	----------
Group C (time between offenses not to have any bearing when considering whether man is repeater):					
Assault	1–0	4–0	Rev.	----------	----------
Group D (time between offenses not to have any bearing when considering whether man is repeater):					
Inattention to duty (intentional)	3–0	12–0	Rev.	----------	----------
Illegal possession of cargo or ship's property	3–0	12–0	Rev.	----------	----------
Neglect of duty; damage to vessel, cargo or personnel (ordinary negligence)	3–0	12–0	Rev.	----------	----------
Pilfering cargo or ship's equipment	3–0	12–0	Rev.	----------	----------
Refusing to perform duty	3–0	12–0	Rev.	----------	----------
Sale of ship's property	3–0	12–0	Rev.	----------	----------
Theft	3–0	12–0	Rev.	----------	----------
Group E (time between offenses not to have any bearing when considering whether man is repeater):					
Assault and battery	6–0	Rev.	----------	----------	----------
Assault with dangerous weapon (no injury)	6–0	Rev.	----------	----------	----------
Destruction of ship's cargo or property	6–0	Rev.	----------	----------	----------
Desertion (foreign)	6–0	Rev.	----------	----------	----------
Continued disobedience of lawful order	6–0	Rev.	----------	----------	----------
Embezzling ship's cargo or property	6–0	Rev.	----------	----------	----------
Neglect of duty; damage to ship, cargo or persons (gross or wilful)	6–0	Rev.	----------	----------	----------
Interference with master, ship's officer, or Government official in performance of official duties	6–0	Rev.	----------	----------	----------
Smuggling of property	6–0	Rev.	----------	----------	----------
Sale of intoxicating liquor	6–0	Rev.	----------	----------	----------
Group F:					
Assault with dangerous weapon (injury)	Rev.	----------	----------	----------	----------
Malicious destruction of ship's property	Rev.	----------	----------	----------	----------
Misconduct resulting in loss of life or serious injury	Rev.	----------	----------	----------	----------
Molestation of passengers	Rev.	----------	----------	----------	----------
Murder or attempted murder	Rev.	----------	----------	----------	----------
Mutiny	Rev.	----------	----------	----------	----------
Perversion	Rev.	----------	----------	----------	----------
Possession, use, sale or association with drugs, including marijuana	Rev.	----------	----------	----------	----------
Sabotage	Rev.	----------	----------	----------	----------
Serious neglect of duty	Rev.	----------	----------	----------	----------
Serious theft of ship's property or stores	Rev.	----------	----------	----------	----------
Smuggling of aliens	Rev.	----------	----------	----------	----------

[1] Abbreviation for "Admonition."
[2] Abbreviation for "Revocation."

§ 137.20–170 Order.

(a) If no charge is found "proved," the order of the examiner shall state that the charge or charges are "dismissed."

(b) If a charge is found "proved," the examiner shall order an admonition, suspension with or without probation, or revocation.

(c) An order shall be directed against all licenses, certificates, and/or documents, except that in cases of negligence or professional incompetence, the order may be made applicable to specific licenses or documents in qualified ratings.

(d) When an examiner determines that the person charged is professionally incompetent in the grade of the license, certificate or document he holds, but is considered competent in a lower grade, the examiner may revoke the license, certificate or document and order the issuance of one of a lower grade.

(e) In a decision rendered in the United States, an order of revocation or outright suspension shall direct the person charged to surrender his license, certificate and/or document immediately. Any domestic order should state that it is effective on service and that the license, certificate and/or document affected is:

(1) Revoked; or,

(2) Suspended outright until a specified period after surrender; or,

(3) Suspended for a specified period subject to a specified period of probation; or,

(4) A combination of subparagraph (2) of this paragraph and a probationary suspension, as indicated in subparagraph (3) of this paragraph, extending from the beginning of the outright suspension until a specified period after the termination of the outright suspension.

(f) In a decision rendered outside of the United States, an order shall differ only in that a revocation or outright suspension is not to be effective until the date of arrival of the person charged in the United States.

§ 137.20–175 Delivery of order and complete decision.

(a) Whenever possible, the examiner shall prepare in writing his complete decision, including the order, and personally deliver it to the person charged or his authorized representative at the final session of the hearing. The decision, including the order, is effective on the date of such delivery.

(b) If it is not possible for the examiner to deliver his complete written decision at the final session of the hearing, he shall render his oral decision on the record, then prepare the order in writing and personally deliver it to the person charged or his authorized representative. The decision, including the order, is effective upon such delivery of the written order. When the written decision is available, the examiner will cause it to be delivered to the person charged or his authorized representative.

(c) If it is not possible for the examiner at the conclusion of the hearing to render an oral decision on the record and to follow the procedures provided for in paragraph (a) or (b) of this section, the written decision, including the order, shall be delivered to the person charged or his authorized representative, at the earliest possible date, either personally or by certified mail with return receipt required to be signed only by the person charged or his authorized representative. The signed acknowledgement or the affidavit of personal delivery, or the return receipt shall be made a part of the record and shall determine the effective date of the decision, including the order, unless good cause is shown why this date should not apply.

(d) As used in this section, the phrase "authorized representative" means any person who has been authorized, as shown by the hearing record, to receive service and take an appeal on behalf of the person charged.

§ 137.20–180 Notification of right to appeal.

(a) The person charged shall be advised by the examiner of his right to appeal in accordance with Subpart 137.30 of this part. The examiner shall also advise the person charged that if such appeal is not taken within the time limit specified in Subpart 137.30 of this part it will not be accepted.

§ 137.20–185 Completion of the hearing.

(a) Upon completion of the procedures in this subpart, the hearing is completed.

§ 137.20–190 Modification of examiner's order and decision.

(a) After an examiner renders his order and decision, it may be modified or changed pursuant to procedures set forth in paragraph (b) of this section, or in Subpart 137.25 of this part for reopening of hearings, or in Subpart 137.30 of this part for appeals, or in Subpart 137.35 of this part for review of examiner's decisions. In the absence of any such procedures, the decision of the examiner is final and binding.

(b) When the proceeding under the provisions of Title 46, U.S. Code, section 239b, is based on a narcotics conviction as referred to in § 137.03–10, rescission of the revocation of a license, certificate or document will not be considered, unless the applicant submits a specific court order to the effect that his conviction has been unconditionally set aside for all purposes. The Commandant reserves the personal right to make the determination in such case.

Subpart 137.25—Reopening of Hearings

§ 137.25–1 Petition to reopen hearing.

(a) At any time prior to a final decision on appeal or within one year from the date of service of the examiner's decision, a person found guilty of any offense may petition to reopen the hearing on the basis of newly discovered evidence.

(b) If at the time the petition is filed an appeal to the Commandant from the examiner's decision has not been filed, the petition to reopen the hearing shall be considered by an examiner. If an appeal to the Commandant has been filed, the petition to reopen the hearing shall be considered by the Commandant.

§ 137.25–5 Form of petition.

(a) The petition shall be in letter form, typewritten or written in a legible hand, and addressed to the examiner or the Commandant, as appropriate.

(b) The petition shall contain the following:

(1) A descriptive identification of the hearing desired to be reopened, including place of hearing, full name of person found guilty, number and description of license and/or document involved, the name of the examiner and date of the decision.

(2) An affirmative declaration that no appeal has been taken pursuant to Subpart 137.30 of this part, or if an appeal has been taken, the date and with whom such appeal was filed.

(3) A statement setting forth why the evidence would probably produce a different result favorable to the person found guilty.

(4) A statement as to whether or not the additional evidence was known to the petitioner at the time of the hearing, and if applicable, reasons why the petitioner, with due diligence, could not have discovered such new evidence prior to the date the hearing was completed.

(5) A statement setting forth briefly and specifically:

(i) The precise nature and purpose of such additional evidence; and,

(ii) The names and addresses of persons to be called as witnesses and the time and place when such witnesses will be available to testify personally or by deposition.

§ 137.25–10 Action on petition.

(a) After the receipt of the petition, an investigating officer shall be afforded a reasonable time within which to file an answer in writing on the merits of the petition. The decision on the petition will be based on a consideration of the petition, the record of the hearing, and the answer, if any.

(b) The petition shall only be granted when new evidence is described which has a direct and material bearing on the issues, and when valid explanation is given for the failure to produce this evidence at the hearing.

(c) The examiner or the Commandant shall render a decision in writing, either granting or denying the petition.

(d) If the examiner grants the petition, he shall reopen the hearing to permit the offer of new evidence described in the petition.

(e) If the petition is granted by the Commandant, he will remand the case to an examiner with directions to reopen the hearing.

(f) On the basis of the record of the original hearing and the new evidence received, the examiner shall either affirm the original decision or withdraw the original decision and render a new one.

(g) The petition, and answer, if any, the examiner's or Commandant's decision, and the additional evidence will be added to the original record.

(h) The filing of a petition to reopen the hearing shall not stay an existing order of the examiner.

(i) If a petition to reopen a hearing is filed within 30 days after the service of the examiner's decision, it will toll or defer the running of the 30-day statutory period of appeal as provided in Subpart 137.30 of this part until an examiner has acted on the petition.

§ 137.25–15 Appeal from action on petition.

(a) If the petition to reopen the hearing is denied by the examiner, the per-

son found guilty may appeal to the Commandant within 30 days from the date of service of the denial of the petition. The review by the Commandant on this appeal will be limited to the issue raised by the petition. Other grounds for appeal must be in accordance with Subpart 137.30 of this part.

(b) If the petition to reopen the hearing is granted and a previous finding of "proved" is affirmed by the examiner, the person found guilty may appeal the decision as provided for in Subpart 137.30 of this part.

Subpart 137.30—Appeals

§ 137.30–1 Time for filing, contents, etc.

(a) A person found guilty by an examiner may, within 30 days after the date of the order of the examiner is effective, take an appeal to the Commandant. This appeal shall be taken by filing a notice of appeal with the District Commander of the district in which the hearing was held.

(b) The notice of appeal shall:

(1) Be typewritten or written legibly;

(2) Be addressed to the Commandant; and,

(3) Set forth the name of the appellant, the number and description of license, and/or document involved, nature of the charge, the order, and the examiner who made the decision.

(c) The notice of appeal may contain a statement of grounds for appeal and/or exceptions. The appellant may file with the notice of appeal a brief or memorandum in elaboration of the matters set forth in the notice of appeal. The notice of appeal may contain a request for transcript of the hearing. No request for such transcript will be accepted unless it is submitted with the notice of appeal.

(d) The District Commander shall transmit this material and a complete transcript of the hearing to the Commandant.

(e) After the appellant or his counsel has received a transcript of the record, any exceptions submitted shall be identified by specific citations to pages in the transcript and shall contain legal and other authorities relied upon to support such exceptions.

(f) The only matters which will be considered by the Commandant on appeal are:

(1) Exceptions properly raised by the appellant as indicated in paragraph (e) of this section;

(2) Clear errors in the record; and,

(3) Jurisdictional questions.

(g) In the preparation of an appeal, neither the investigating officer nor the examiner will assist the appellant beyond the point of informing him of the proper form to be used and the applicable regulations.

§ 137.30–3 Time in which to complete appeal.

(a) Appellant may submit grounds for appeal and exceptions to the examiner's decision, whether or not any such matter was filed with the notice of appeal. This matter must be submitted within 60 days after receipt of the transcript of the hearing record, or, if no transcript was requested, within 60 days of the date of effective service of the decision. Nothing further will be received and considered as a part of the appeal record after the applicable time has elapsed unless it is extended by the Commandant.

(b) Prior to the expiration of the applicable 60-day period of extension thereof as set forth in paragraph (a) of this section, at least one ground for appeal or exception to the examiner's decision must be filed in support of the notice of appeal. Failure to do so will result in one of the following:

(1) Termination of the case by written notice to the appellant or his counsel, that the decision of the examiner constitutes the final agency action on the merits of the case; or,

(2) Consideration of the appeal on the merits of the case and publication of the Commandant's decision without prior notice to the appellant or his counsel. This will only be done when some clear error appears in the record, or when the case presents some novel policy consideration.

§ 137.30–5 Record for decision on appeal.

(a) The transcript of hearing, together with all papers and exhibits filed, shall constitute the record for decision on appeal.

§ 137.30–10 Action on appeal.

(a) The Commandant may affirm, reverse, alter, or modify the decision of the examiner, or he may remand the case for further hearing. The decision of the Commandant on appeal shall be final in the absence of a remand.

§ 137.30–15 Temporary documents.

(a) Any person who has appealed from a decision suspending or revoking his document may file a written request for a temporary document with the Examiner who rendered the decision or with any Officer in Charge, Marine Inspection, for forwarding to such Examiner. The request will be granted by the Examiner except (1) when the hearing transcript has been forwarded to the Commandant, or (2) when, in the opinion of the Examiner, the order of suspension or revocation rests upon a finding of guilty for a serious offense of such a character that the presence of the person charged on board a vessel, either immediately or for the indefinite future, would be incompatible with the requirements of safety of life or property at sea, or for a serious offense found by the Examiner to have been committed willfully.

(b) If the transcript has been forwarded to the Commandant, or if the request is denied by the Examiner, the request shall be forwarded by the Examiner to the Commandant for final action. A temporary document may be issued in the discretion of the Commandant, except where such action, in the opinion of the Commandant, would be incompatible with the requirements of safety of life or property at sea.

(c) A temporary document shall be subject to such terms and conditions as the Commandant or Examiner may prescribe. However, all such documents shall provide that they expire not more than six months after issuance or upon service of the Commandant's decision on appeal, whichever occurs first. If a temporary document expires before the Commandant's decision is rendered, it may be renewed, after authorization by the Commandant, by the issuance of a new temporary document by an Officer in Charge, Marine Inspection.

(d) Copies of the temporary documents issued shall become a part of the record on appeal.

§ 137.30–20 Appeal cases remanded for further proceedings.

(a) When the Commandant renders a decision remanding a case for further proceedings, the remand is directed to the examiner. The examiner shall notify the parties and set a date for continuance of the proceedings. In the absence of specific directions from the Commandant, the examiner shall either reopen the former hearing or conduct a new hearing.

(b) If the hearing is reopened, the evidence in the prior hearing shall be evaluated together with the new evidence submitted.

(c) In a new hearing, the evidence in the prior hearing may be used for purposes of impeachment. Evidence in the prior hearing may be stipulated as a part of the record of the new hearing.

(d) The examiner shall render either an entirely new decision or a decision incorporating by reference his original decision as necessary.

Subpart 137.35—Review of Examiners' Decisions in Guilty Cases

§ 137.35–1 Commandant's review.

(a) Any decision of an examiner, in which there has been a guilty finding, may be called up for review by the Commandant on his own motion or direction, within sixty (60) days, after the decision is announced or has been made effective, whichever date is later. On occasion, such action may be taken upon recommendation of the District Commander within whose jurisdiction the decision of the examiner was announced. As used in the regulations in this part the phrase, "on his own motion" means by the Commandant's direction or order, without other procedural formality.

(b) The processes in effect with respect to the preparation and presentation of the record on appeals by merchant seamen, shall apply to the consideration of cases brought up on review by the Commandant.

§ 137.35–5 Record for decision on review.

(a) The transcript of hearing, together with all papers and exhibits filed, shall constitute the record for consideration on review.

§ 137.35–10 Scope of review.

(a) The review will be restricted to questions of law, fact, and policy.

§ 137.35–15 Action on review.

(a) In no case will the review by the Commandant be followed by any order increasing the severity of the examiner's original order.

(b) The Commandant may adopt in whole or in part the findings, conclusions, and basis therefor stated by the examiner, or he may make entirely new findings on the record, or he may remand the case to the examiner for further proceedings.

(c) The decision of the Commandant, on review, shall be final in the absence of a remand.

Subpart 137.50—Disclosure of Information

§ 137.50–1 Public information.

(a) Upon inquiry information may be released as to whether an investigation of a specified complaint is in progress, or that charges have been preferred, or that an investigation has been closed.

(b) Upon inquiry information may be released as to scheduled times of hearings and the substance of charges to be considered.

(c) Upon inquiry information disclosed at public hearings before examiners may be released so long as the cases have current public interest. Such information regarding cases no longer having current public interest will not be released unless otherwise provided for in this subpart or Subpart 137.55 of this part.

§ 137.50–5 Public records.

(a) There shall be maintained as public records available for inspection at Coast Guard Headquarters, in each district office, and in each marine inspection office, a file of the Commandant's Decisions on Appeal or Review.

(b) There shall be maintained as public records available for inspection at Coast Guard Headquarters a file of the decisions of examiners.

(c) There shall be maintained as public records available for inspection in the Office of the District Commander a file of copies of decisions of examiners rendered within such district.

§ 137.50–10 Administrative records.

(a) All files, records, testimony, documents, reports, or other data pertaining to an investigation to determine whether or not a hearing should be instituted, are administrative records. They are not public records available for inspection.

Subpart 137.55—Release of Records

§ 137.55–1 Public records.

(a) Upon written application, copies of public records referred to in Subpart 137.50 of this part may be obtained by persons properly concerned because of litigation or other reasonable collateral interest in the proceedings.

§ 137.55–5 Hearing transcript to appellant.

(a) A copy of the complete hearing transcript will be given to an appellant when it is requested in accordance with § 137.30–1.

§ 137.55–10 Hearing transcript to other persons.

(a) Upon written application, a complete copy of, or excerpts from, a hearing record may be obtained by persons properly concerned because of litigation or other reasonable collateral interest in the proceedings: *Provided*, That the record has been transcribed and copies are available.

§ 137.55–15 Written applications.

(a) A written application required by this subpart shall be addressed to the person in charge of the office where such records are maintained. The application shall be made by the party desiring the record or his authorized representative and shall:

(1) Identify the applicant (submit proof if representing another person);

(2) Specify the material desired;

(3) State the reason for the request; and,

(4) State whether or not the material is intended for use in litigation involving the United States.

§ 137.55–20 Action on written applications.

(a) The person to whom a written application for the release of records is addressed shall comply with the request if it meets the requirements of this subpart. Otherwise, the request shall be denied or, in doubtful cases, referred to the Commandant for determination.

§ 137.55–25 Authorized representatives.

(a) When the release of records is provided for in this subpart, such records may be obtained by an agent or attorney whose authority to act on behalf of another person is established by:

(1) A signed statement by the party represented; or,

(2) A statement, on the hearing record, by the party represented; or,

(3) A copy of a contract of retainer signed by the party represented.

(b) When the release of records is provided for in this subpart, such records may be obtained by an executor, administrator, heir, guardian, trustee or other legal representative of a deceased or incompetent person: *Provided*, That proof of the relationship is submitted.

§ 137.55–30 Production upon compulsory process.

(a) When a request for records is denied for any reason, the applicant shall be advised that the records may be obtained by service of a subpena duces tecum or an order from a court of competent jurisdiction. However, if the information desired is classified for security reasons or by virtue of a specific law or executive order the applicant shall also be advised that such subpena or court order should be addressed to the Commandant.

§ 137.55–35 Persons directly concerned.

(a) Appellants in these proceedings are the only persons considered to be directly concerned and, therefore, entitled to free copies of these records as a matter of right upon proper request.

§ 137.55–40 Costs.

(a) The release of records authorized by this subpart shall be subject to the payment of costs prescribed in 33 CFR 1.25 with the exception of hearing transcripts furnished to appellants.

Subpart 137.60—Persons in Service of Coast Guard

§ 137.60–1 Testimony by Coast Guard personnel.

(a) Except as provided in paragraph (c) of this section, no person in the service of the Coast Guard shall, without prior approval of the Commandant, give any testimony with respect to any investigation or any other official proceedings in any suit or action in the courts. This applies equally to cases in State or Federal courts and to civil as well as criminal cases.

(b) In cases involving (1) civil litigation between private parties; or, (2) criminal matters before State courts; or, (3) civil litigation for or against the United States where Coast Guard personnel are called by parties opposing the United States; an affidavit by the litigant or his attorney setting forth the interest of the litigant and the information with respect to which the testimony of such Coast Guard officer or employee is desired must be submitted before permission to testify will be granted. Permission to testify will, in all cases, be limited to the information set forth in the affidavit, or to such portions thereof as may be deemed proper. In addition to the permission required by this paragraph, the Commandant may insist that the appearance of the Coast Guard officer or employee as a witness be conditioned on the issuance of a subpena or subpena duces tecum (as appropriate) from a court of competent jurisdiction.

(c) In cases where the appearance of Coast Guard personnel is desired by counsel representing the United States to support the affirmative claims or defenses of the United States in civil matters or on behalf of the United States in criminal matters, no affidavit as described in paragraph (b) of this section shall be required, but the Commandant's prior approval must be nevertheless obtained, except in those cases where the Coast Guard personnel desired as witnesses file the original complaint or have made original inquiry into the subject matter which resulted in the filing of an original complaint.

SUBCHAPTER L—OVERTIME SERVICES

PART 143—EXTRA COMPENSATION FOR OVERTIME SERVICES

Sec.

143.1 Extra compensation; Coast Guard civilian personnel.
143.2 Payment although no actual service performed.
143.3 Overtime earnings not basis for overtime under Federal Employees Pay Act of 1945.
143.4 Waiting time; actual report for duties.
143.5 Night, Sunday, and holiday, defined.
143.6 Rate for night service.
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Sec.
143.8 Broken periods.
143.9 Two hours between broken periods.
143.10 Waiting time.
143.11 Proration of charges.
143.12 Travel status overtime.
143.13 Congressional appropriations necessary.
143.14 Assessment and collection of fees.
143.15 Application form.
143.16 Billing for services.
143.17 Protests.

AUTHORITY: The provisions of this Part 143 issued under R.S. 4462, as amended; 46 U.S.C. 416. Interpret or apply sec. 6, 49 Stat. 1385, as amended; 46 U.S.C. 382b. Treasury Department Order 120, July 31, 1950, 15 F.R. 6521.

§ 143.1 Extra compensation; Coast Guard civilian personnel.

Civilians assigned to the duties formerly assigned to local inspectors and their assistants, United States shipping commissioners and their deputies and assistants prior to Reorganization Plan No. 3 of 1946 (3 CFR, 1946 Supp.), and customs officers and employees, while performing duties in connection with the inspection of vessels or their equipment, supplying or signing on or discharging crews of vessels, at night or on Sundays and holidays, shall receive extra compensation to be paid by the master, owner, or agent of the vessel to the local United States collector of customs or his representative. (See § 143.16.)

§ 143.2 Payment although no actual service performed.

The rates of extra compensation are payable in cases where the services of officers or employees have been duly requested and the officers or employees have reported for duty, even though no actual service may be performed.

§ 143.3 Overtime earnings not basis for overtime under Federal Employees Pay Act of 1945.

Overtime, Sunday, and holiday services which are covered by payments under this part shall not also form a basis for overtime or extra pay under the Federal Employees Pay Act of 1945.

§ 143.4 Waiting time; actual report for duties.

Extra compensation for "waiting time" will not be allowed unless and until an officer or employee actually reports for duty.

§ 143.5 Night, Sunday, and holiday defined.

(a) For the purpose of this part the word "night" shall mean the time between 5 p.m. of any day and 8 a.m. of the following day.

(b) The term "holiday" shall mean only national legal public holidays, viz., January 1, February 22, May 30, July 4, the 1st Monday in September, November 11, the 4th Thursday in November, December 25, and such other days as may be declared legal public holidays by an act of Congress or by an Executive order of the President of the United States.

(c) The term "Sunday" shall include the first day of each calendar week.

§ 143.6 Rate for night service.

The rate of extra compensation for authorized overtime services performed at night on any week day is hereby fixed at one-half the gross daily rate of regular pay of the employee who performs the services for each 2 hours of compensable time, any fraction of 2 hours amounting to at least one hour to be counted as 2 hours. In computing the amount earned, each 2 hours is the time period for the purpose of computation, at least one hour means the minimum service in each period for which extra pay may be granted. If service continues beyond a 2 hour period, it must extend for at least one hour into the following 2 hour period to be entitled to extra pay for the second period. When the overtime extends beyond 5 p.m., payment of extra compensation from 5 p.m., for services consisting of at least one hour is authorized, even though such services may not actually begin until 7 p.m., 9 p.m., or later: *Provided*, That the officer rendering the service remained on duty from 5 p.m., in which case the time between 5 p.m., and the time of beginning the actual service shall be computed as waiting time; and where the actual services begin as late as 9 p.m., there should be an affirmative statement that the officer was required to remain on duty between 5 p. m., and 9 p. m., if a charge for waiting time is made. The maximum amount of extra compensation which may be paid an employee for services during one night shall not exceed two and one-half times the gross daily rate of his regular pay.

§ 143.7 Rate for Sunday or holiday services.

The rate of extra compensation for Sunday or holiday services is hereby fixed at twice the gross daily rate of regular pay of the employee who performs the service, for any and all services totaling an aggregate of not more than nine hours, with one hour for food and rest, during the 24 hours from midnight to midnight of the Sunday or holiday including actual waiting time and time required for travel between posts of duty but not including other time not spent at the post of duty. This rate shall apply regardless of the length of time served within the aggregate of the aforesaid 9 hours, whether it is served continuously or in broken periods, and whether it is served for one or more applicants. Services in excess of an aggregate of the aforesaid 9 hours performed during the 24 hours of a Sunday or holiday shall be compensated on the same basis as overtime services performed at night on a week day, the time between the completion of the aggregate of the aforesaid 9 hours and midnight being considered as the hours of a night. The maximum amount which may be paid an employee for services performed during the 24 hours of a Sunday or holiday shall not exceed four and one-half times the gross daily rate of his regular pay.

§ 143.8 Broken periods.

In computing extra compensation where the services rendered are in broken periods and less than 2 hours intervene between such broken periods, the time served should be combined with the waiting time and computed as continuous service.

§ 143.9 Two hours between broken periods.

Where 2 hours or more intervene between broken periods, one-half day's extra pay will be allowed for each distinct 2-hour period or part of a 2-hour period, if waiting time and actual service rendered within each period consists of at least 1 hour.

§ 143.10 Waiting time.

The same construction should be given the act when charging for waiting time as governs the charge for services actually rendered. No charge should be made unless after having reported for duty the waiting time amounts to at least one hour.

§ 143.11 Proration of charges.

If services are performed for two or more applicants during one continuous tour of overtime duty, the charge for the extra compensation earned shall be prorated equitably according to the time attributable to the services performed for each applicant.

§ 143.12 Travel status overtime.

When employees are in travel status, overtime shall apply the same as at official station.

§ 143.13 Congressional appropriations necessary.

Payment of extra compensation for overtime services shall be subject to appropriations being made therefor by Congress.

§ 143.14 Assessment and collection of fees.

Assessment and collection of fees against steamship companies for overtime services shall be made even though the payment to employees for such services may not be made until funds are appropriated for that purpose.

§ 143.15 Application form.

An application on a form prescribed by the Commandant of the Coast Guard, shall be filed with the office being requested to furnish overtime services before such assignment can be made.

§ 143.16 Billing for services.

Overtime services shall be billed to the steamship companies on collection voucher provided for that purpose. Remittance shall be made by postal money order or certified check payable to the "Collector of Customs, Treasury Department" and forwarded to that officer at the port indicated on the voucher, who shall in turn deposit such remittance to a properly designated receipt account.

§ 143.17 Protests.

Protests against the exaction of extra compensation shall be forwarded to the Commandant of the Coast Guard.

SUBCHAPTER M—BULK GRAIN CARGOES

PART 144—LOADING AND STOWAGE OF GRAIN CARGOES

Subpart 144.01—Preface

Sec.
144.01-1 Purpose.

Subpart 144.10—General Requirements

144.10-1 Scope.
144.10-10 Application to vessels.
144.10-20 Definitions.
144.10-25 Certification by National Cargo Bureau, Inc.
144.10-30 Shifting boards.
144.10-40 Uprights.
144.10-50 Shores.
144.10-60 Stays.
144.10-70 Feeders, bins, and bulkheads.
144.10-80 Security of hatches.
144.10-90 Equivalents.
144.10-95 Responsibility of owner or master.

Subpart 144.20—Detailed Loading and Stowage Requirements

144.20-1 Trimming and filling.
144.20-2 Bagged grain.
144.20-10 Stowage of full holds and compartments.
144.20-20 Feeders required.
144.20-22 Stowage of partly filled holds and compartments.
144.20-24 Exceptions to the requirements for longitudinal bulkheads.
144.20-26 Trimming and bagging of end spaces.
144.20-28 Common loading.
144.20-30 Bulk grain in tween decks and superstructures.
144.20-32 Stowage of specially suitable ships.
144.20-34 Stability conditions.
144.20-36 Grain loading plans.

Subpart 144.30—Vessels Shifting Ports

144.30-1 Shifting vessels with part cargoes of loose grain in bulk.

AUTHORITY: The provisions of this Part 144 issued under R.S. 4405, as amended, 4462, as amended, sec. 632, 63 Stat. 545; 46 U.S.C. 375, 416, 14 U.S.C. 632. Interpret or apply R.S. 4417, as amended, 4426, as amended, sec. 1, 49 Stat. 1544, as amended, sec. 3, 68 Stat. 675; 46 U.S.C. 391, 404, 367, 50 U.S.C. 198; E.O. 11239, July 31, 1965, 30 F.R. 9671, 3 CFR, 1965 Supp. Treasury Department Orders 120, July 31, 1950, 15 F.R. 6521; 167-14, Nov. 26, 1954, 19 F.R. 8026; CGFR 56-28, July 24, 1956, 21 F.R. 5659; 167-38, Oct. 26, 1959, 24 F.R. 8857.

Subpart 144.01—Preface

§ 144.01-1 Purpose.

(a) The purpose of the regulations in this subchapter is to promote safety in the handling, stowage and transportation of grain on board vessels within the limits of the jurisdiction of the United States, including its territories and possessions excepting only the Panama Canal Zone, and to make more effective the provisions of the International Convention for Safety of Life at Sea, 1960, relative to the carriage of grain.

Subpart 144.10—General Requirements

§ 144.10-1 Scope.

(a) The regulations in this part contain the minimum requirements for the handling, stowage, and transportation of loose grain in bulk on board vessels.

§ 144.10-10 Application to vessels.

(a) Except as specifically provided otherwise in this section, the regulations in this part apply to every cargo vessel of 500 gross tons or over and every passenger vessel, which:

(1) Loads loose grain in bulk within the limits defined in § 144.01-1(a) for an ocean or coastwise voyage, including such a voyage originating at a United States Great Lakes grain loading port; or,

(2) Is of United States registry and carries loose grain in bulk on an ocean or coastwise voyage, including such a voyage originating at a Great Lakes grain loading port.

(b) The regulations in this part do not apply to vessels engaged on voyages solely between ports within the limits of the Great Lakes and the St. Lawrence River as far east as a straight line drawn from Cap de Rosiers to West Point, Anticosti Island, and on the north side of Anticosti Island following the 63d meridian.

§144.10-20 Definitions.

(a) For the purpose of the regulations in this part the definitions in this section shall apply.

(b) "Grain" shall include wheat, maize (corn), oats, rye, barley, rice, pulses, and seeds.

(c) "Light grain" means oats, light barley or cottonseed.

(d) "Light barley" means barley which weighs:

(1) 50 pounds or under per full bushel of 1.2445 cubic feet (U. S. A.); or,

(2) 51.575 pounds or under per full bushel of 1.2837 cubic feet (U. K.).

(e) "Heavy grain" means all grain other than oats, light barley, or cottonseed.

(f) "Bin" means a section of the cargo space in the 'tween decks or superstructure completely enclosed on all sides.

§ 144.10-25 Certification by National Cargo Bureau, Inc.

(a) Certificates of loading of the National Cargo Bureau, Inc., may be accepted as prima facie evidence of compliance with the requirements in this subchapter.

§ 144.10-30 Shifting boards.

(a) Shifting boards shall be of good sound timber of minimum thickness of 2 inches, and fitted grain-tight.

(b) The maximum unsupported span to be allowed for shifting boards of various thicknesses shall be as set forth in Table 144.10-30 (b).

TABLE 144.10-30 (b)

Thickness	Span	Housing of bulkhead
		Inches
2-inch planks	Unsupported span not to exceed 8 feet.	3
2½-inch planks	Unsupported span not to exceed 11 feet.	3
3-inch planks	Unsupported span not to exceed 13 feet.	3

(c) Shifting boards shall be securely housed at bulkheads, and where permanent angle bars are not available for this purpose, wood cants shall be fitted not less than 6 inches in width and 3 inches in thickness and suitably shored.

(d) Where 2½ inch or 3 inch shifting boards are used the boards may be butt-jointed in way of the uprights and at least 4 inches of plank shall be supported. Where 2 inch shifting boards are used the joints shall overlap by at least 9 inches in way of the uprights.

(e) Where no special arrangements are made for grain-tight filling between the beams, wood filling pieces of the same thickness as the shifting boards shall be fitted grain tight between the beams, and shall be secured in place by cleats or scabs at both ends and fitted both sides. The cleats or scabs shall be at least 2 inches by 4 inches and shall extend the full depth of the filling piece and to an equal distance thereunder, and shall be securely spiked or bolted to the shifting boards and filling pieces.

§ 144.10-40 Uprights.

(a) Uprights shall be of wood or steel.

(b) Wood uprights shall not be less than 10 inches in width and 2 inches in thickness.

(c) Uprights shall be cleated to the tanktop or ceiling where fitted, and when an upright is not securely housed at the top the uppermost supporting shores or stay shall be not more than 18 inches below the deck or top of the upright.

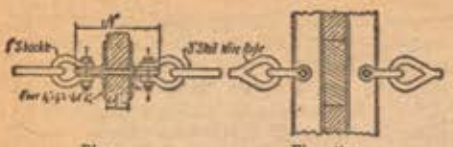
(d) (1) Where a tier of closely spaced pillars in a hold or compartment is utilized for supporting the shifting boards at the middle line, the sizes of the pillars shall be in accordance with the rules of approved classification societies for deck beam pillars.

(2) Where the pillars are not reeled or staggered, additional support shall be provided by means of hook-bolts and vertical tieplates or uprights secured to the pillars. Such tieplates shall consist of plates not less than 3 inches in width and ½ inch in thickness and shall be through-bolted at intervals of not more than 3 feet.

(e) The horizontal distances between the centers of uprights shall be specified in § 144.10-30 (b). Wood uprights used in association with wire stays, spaced as in § 144.10-60, shall be not less than 11 inches in width and 3 inches in thickness.

(f) The construction and dimensions of angle bar uprights used in association with wire stays shall conform to, or be equivalent to, the following:

(1) *Type I.* Each upright shall consist of 4 angle bars 4 by 4 by 0.40 inches and steel plate 11½ inches wide by .50 inch thick riveted to form one complete structure allowing 4-inch housings on both forward and after sides. Equivalent brackets riveted to head and heel shall be fitted, each to take five ⅞-inch bolts with corresponding lugs and/or angles on tank top, tunnel top, and hatch webs. See Figure 144.10-40 (f) (1) for illustration.



— Plan. — — Elevation. —

FIGURE 144.10–40 (f) (1)

(2) *Type II.* Metal uprights in accordance with Table 144.10–40 (f) (2). Vertical angle bars shall be connected at head and heel to the tank top, tunnel top, deck beams, and hatch webs by angle lugs having two ⅞-inch bolts in each angle bar upright and equivalent fastenings to tanktop, tunnel top, deck beams, and hatch webs. The vertical angle bars shall be bolted together through the shifting boards by ⅞-inch bolts not more than 4 feet apart. See figure 144.10–40 (f) (2) for illustration with overlap of shifting boards.

TABLE 144.10–40 (f) (2)

Horizontal distance between centers of uprights	Vertical spans supported by each stay	Sizes of angle bars
	Feet	*Inches*
8' (2" shifting boards)	8	3 x 3 x 0.38
8' (2" shifting boards)	11	3½ x 3½ x 0.38
8' (2" shifting boards)	14	4½ x 3½ x 0.44
11' (2¼" shifting boards)	8	3 x 3 x 0.38
11' (2¼" shifting boards)	11	4 x 3½ x 0.40
11' (2¼" shifting boards)	14	6 x 3½ x 0.40
13' (3" shifting boards)	8	3 x 3 x 0.38
13' (3" shifting boards)	11	4 x 3½ x 0.42
13' (3" shifting boards)	14	6 x 3½ x 0.40

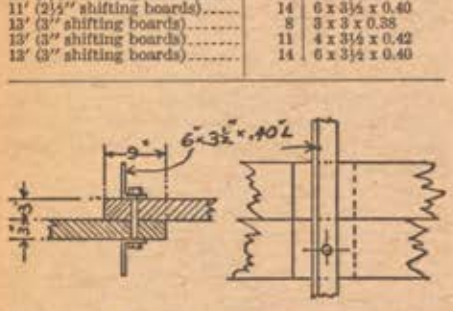


FIGURE 144.10–40 (f) (2).

(g) Wood uprights shall be supported by steel wire rope stays set up at the ship's side, or by wood shores securely heeled against the permanent structure of the ship, or by other approved means.

§ 144.10–50 Shores.

(a) All wood shores shall be of good sound timber in a single piece. Spliced shores shall not be used.

(b) The vertical spacing of wood shores shall be as follows:

(1) Except as provided in § 144.10–40 (c), the uppermost shore shall be not more than 7 feet below the top of the upright and succeeding shores shall be spaced 7 feet apart measured vertically from the uppermost shore downwards, except that a distance of 8 feet may be allowed between the lowest shore and the heel support.

(2) Shores may be heeled on the tanktop or ceiling provided the heels are secured by cleats or cants and efficiently braced against the permanent structure.

(3) Shores shall not be heeled directly against the ship's side plating.

(c) The sizes of wood shores shall be set forth in Table 144.10–50 (c).

TABLE 144.10–50 (c)

Length of shores	Minimum sizes	
	Rectangular section	Circular section diameter
	Inches	*Inches*
Not exceeding 16 feet	4 x 6	5¼
Over 16 feet and not exceeding 20 feet	6 x 6	7
Over 20 feet and not exceeding 24 feet	6 x 8	7¼
Over 24 feet and not exceeding 28 feet	[1] 6 x 8	8
Over 28 feet	[1] 6 x 8	8½

[1] Securely bridged at about midlength.

(d) Where the spacings of the shores or uprights are less than those prescribed by §§ 144.10–30 (b) and 144.10–50 (b), the sizes of the shores may be reduced in proportion, and where, in special circumstances, the spacings of the shores or uprights are increased, additional strength shall be provided as may be prescribed by the District Commander of the United States Coast Guard or his authorized representative.

(e) Shores should normally be fitted at an angle not exceeding 10 degrees from the horizontal; where this angle is exceeded the next larger size of shore to that required by its length shall be used. The angle between any shore and the surface to be supported shall not exceed 45 degrees from the horizontal.

§ 144.10–60 Stays.

(a) Where uprights are secured as approved at both head and heel, one stay on each side of each upright will be accepted in holds 20 feet and under in depth, to be placed at approximately ⅓ of the distance below the deck. Where the hold is more than 20 feet deep, 2 stays on each side of each upright shall be required, the upper stays to be placed at approximately ¼ of the distance below the deck and the lower stays at half the depth of the hold. Depths shall be measured to top of floor, inner bottom or tunnnel top.

(b) Where wire stays are used the following provisions shall apply:

(1) The stays shall be of at least 3-inch circumference flexible steel wire rope and shall be fitted horizontally;

(2) The rigging screws shall be at least 1¼-inch diameter and shall be fitted in accessible positions;

(3) The shackles shall be at least 1 inch;

(4) The eye bolts through the wood or angle bar uprights shall be at least 1¼ inches;

(5) At least ⅞-inch screw bolts and nuts shall be provided as may be necessary for securing the wood uprights or steel angle bars;

(6) Eye plates of at least 1 inch thickness shall be securely riveted to the side stringers or frames, or at least 1 inch shackles passed through the frames.

(c) Where in accordance with § 144.20–20 shifting boards do not extend the full depth of the hold, the shifting boards and their uprights shall be supported or stayed as provided for in the regulations in this part or to the satisfaction of the District Commander of the United States Coast Guard or his authorized representative.

§ 144.10–70 Feeders, bins, and bulkheads.

(a) Feeders, bins, and bulkheads shall be of sufficient strength to withstand the pressure of the head of grain contained therein and shall be made grain tight. When the height of the 'tween decks is greater than normal, special attention should be given to the stiffening and support of feeders and bins.

(b) Wood feeders and bin bulkheads may be constructed:

(1) Of planks worked vertically not less than 2½-inch thickness, but where the vertical unsupported span exceeds 8 feet the thickness of the planks shall be increased, or additional stiffening fitted; or,

(2) Of studding and lined with grain-tight boards 2 inches in thickness or two 1 inch layers of shiplap, laid horizontally with broken joints. Studding where possible shall be placed inside the hatch coamings and shall be not less than 4 inches by 6 inches on edge spaced not more than 2 feet centers.

(c) Wing feeders may be constructed in a similar manner around trimming hatches. In all cases the planks at the corners shall be well secured to substantial vertical cants.

(d) Where the depth of the hatch end beams or coamings exceeds 15 inches below the surface of the deck, feeding holes shall be provided to allow the grain to flow through the coamings into the hold or 'tween decks; where the depth of the coamings below the surface of the deck exceeds 15 inches and is not more than 18 inches feeding holes 2 inches in diameter shall be provided. Where the depth exceeds 18 inches feeding holes of 3½-inch diameter shall be provided. Feeding holes shall be spaced approximately 2 feet apart.

(e) Engine room, boiler room, stokehold bulkheads and donkey boiler recesses where subjected to heat shall be sheathed with wood and made grain tight. An air space of at least 6 inches shall be left between the bulkhead and the sheathing and a box trunk ventilator 6 inches by 8 inches shall be provided from the top of the air space to a ventilator or hatchway, or other equal and approved means of ventilation adopted. Sheathing shall be supported on vertical runners spaced not more than 2 feet centers and shall consist of 2 inch planks or two thicknesses of 1 inch boards laid to break joint. Other approved means of insulation may be accepted.

(f) Feeders or bin bulkheads may be constructed of bagged grain: *Provided,* That:

(1) The bags are tightly stowed and interlocked.

(2) Whenever practicable the bags are so stowed as to engage firmly with

the vessel's sides, bulkheads, and other convenient structures. Where this is not possible, the bagged bulkheads are to be not less than 11 feet (mean) in thickness and stepped.

(3) Transverse bagged bulkheads not in way of hatchways or forming feeders but supporting grain on one side only are to be not less than 11 feet (mean) in thickness and stepped.

(4) In place of bagged grain, as required by this section, cased, baled, or other suitable cargo may be used provided it is equally strongly supported and made grain-tight with strong separation cloths.

§ 144.10–80 Security of hatches.

(a) Vessels carrying loose grain in bulk shall have suitable means of securing hatchways and other weather deck openings. Hatch covers and their supports shall be in good condition and properly battened down using good and sufficient tarpaulins, cleats and wedges where necessary.

§ 144.10–90 Equivalents.

(a) Where the regulations in this part require a particular fitting, appliance or apparatus or type thereof, shall be fitted or carried in a ship, or that any particular provisions shall be made, the District Commander of the United States Coast Guard or his authorized representative may allow any other fitting, appliances or apparatus, or type thereof, to be fitted or carried, or any other provision to be made, if it is satisfactorily shown that such other fitting, appliance or apparatus, or type thereof, or provision is at least as effective as that required by the regulations in this part.

(b) In any case where it is shown to the satisfaction of the Commandant that the use of specified loading and stowage requirements in this part are unreasonable or impracticable, the Commandant may permit the use of equivalent loading and stowage requirements in lieu of those described in this part to such extent and upon such conditions as will insure to his satisfaction a degree of safety consistent with the minimum standards set forth in Subparts 144.10 to 144.30, inclusive.

§ 144.10–95 Responsibility of owner or master.

(a) The loading of bulk grain in accordance with the regulations in this part is a responsibility of the master, who shall designate a competent responsible person to be in constant attendance during loading operations. Nothing in the regulations in this part shall be deemed to relieve the owner or master of a ship from taking all necessary and reasonable precautions to prevent grain from shifting.

Subpart 144.20—Detailed Loading and Stowage Requirements

§ 144.20–1 Trimming and filling.

(a) The safe loading of grain, in accordance with the regulations in this part, is vitally dependent upon compartments which are treated as entirely filled, being actually well trimmed so as to fill all the spaces between the beams and in the wings and ends. It is equally important that the feeders be loaded and trimmed so as to contain at least the minimum percentage of grain required by the regulations in this part.

(b) Spaces which are to be partly filled and bagged off, or equivalent, must be levelled for proper bagging.

§ 144.20–2 Bagged grain.

(a) Bagged grain stowed in a hold, compartment or bin with loose grain in bulk shall be in sound bags, well filled and securely closed.

§ 144.20–10 Stowage of full holds and compartments.

(a) Subject to the provisions of § 144.20–22, any hold or compartment which is entirely filled with bulk grain shall be divided either by a longitudinal bulkhead or by a shifting board in line with, or not more than 5 percent of the molded breadth of the vessel from the center line; or by longitudinal bulkheads or shifting boards off the centerline of the vessel, port and starboard, provided the distance between them shall not exceed 60 percent of the molded breadth of the vessel, and that in this latter case trimming hatches of suitable size shall be provided in the wings at longitudinal intervals of not more than 25 feet with end trimming hatches placed not more than 12 feet from transverse bulkheads. In every case the longitudinal bulkheads or shifting boards shall be properly constructed and fitted grain-tight with proper fillings between the beams. In holds such longitudinal bulkheads or shifting boards shall extend downwards from the underside of the deck to a distance of at least one-third of the depth of the hold or 8 feet, whichever is the greater. In compartments in tween decks and superstructures they shall extend from deck to deck. Except as provided otherwise in this section, longitudinal bulkheads or shifting boards shall extend to the top of the feeders of the hold or compartment in which they are situated.

(b) In the case of vessels loaded with bulk grain other than linseed, in which a metacentric height (after correction for the free surface effects of liquids in tanks and as otherwise noted in this part) is maintained throughout the voyage of not less than 1¾ percent of the vessel's beam but not less than 12 inches in the case of one or two deck vessels, and not less than 2 percent of the vessel's beam but not less than 14 inches in the case of other vessels, longitudinal bulkheads or shifting boards need not be fitted in the following locations and subject to the following conditions:

(1) Below and within 7 feet of a feeder, but only in way of a hatchway, if that feeder contains, or all the feeders collectively feeding a compartment contain, not less than 5 percent of the quantity of grain carried in that compartment.

(2) In feeders which meet the requirements of subparagraph (1) of this paragraph and which have such dimensions that the free grain surface will remain within the feeders throughout the voyage, after allowing for a settling of grain amounting to 2 percent of the volume of the compartment fed and a shift of the free grain surface to an angle of 12 degrees to the horizontal. In calculating the net minimum metacentric height, the heeling moment due to such a grain shift shall be allowed for by taking a deduction equal to this moment divided by the product of the displacement and the sine of 5 degrees.

(3) In way of the hatchway where the bulk grain beneath the hatchway is trimmed in the form of a saucer hard up to the deckhead beyond the hatchway and is topped off with bagged grain or other suitable bagged cargo extending to a height in the center of the saucer of not less than 6 feet above the top of the bulk grain (measured below the deck line). In this case, the bagged grain or other suitable bagged cargo shall fill the hatchway and the saucer below and shall be stowed tightly against the deckhead, the longitudinal bulkheads, the hatchway beams and the hatchway side and end coamings. For the purposes of this subparagraph suitable packaged general cargo having a stowage factor of not less than 25 cubic feet or not more than 70 cubic feet per ton, and of such unit dimension that it can be stowed tightly to completely fill the saucer, may be used in place of bagged cargo provided a tarpaulin or separation cloth is used between the cargo and the grain.

§ 144.20–20 Feeders required.

(a) Except as otherwise provided in § 144.20–10(b)(3) and as subsequently otherwise provided in this section, any hold or compartment which is entirely filled with bulk grain shall be fed by suitably placed and properly constructed feeders so as to secure a free flow of grain from the feeder to all parts of that hold or compartment. Each feeder shall contain not less than 2½ percent nor more than 8 percent of the quantity of grain carried in that part of the hold or compartment that it feeds, except as provided in § 144.20–10(b)(1). Feeders which do not extend to the weather deck but which instead open up into a tween deck shall either be of such dimensions and filling level that a shift of grain free surface to an angle of 12 degrees to the horizontal cannot spill out of the feeder, or the grain free surface shall be secured against such shifting and spillage.

(b) When bulk grain is carried in deep tanks primarily constructed for the carriage of liquids, or in other spaces of comparable size, location, arrangement, and construction, of breadth not exceeding half the vessel's beam, or that are divided by one or more permanent steel longitudinal divisions fitted grain-tight, feeders to these spaces may be omitted if the tanks and tank hatchways are completely filled and the hatch covers secured.

§ 144.20–22 Stowage of partly filled holds and compartments.

(a) Subject to the provisions of § 144.20–24, if any hold or compartment is

partly filled with bulk grain, it shall comply with both of the following conditions:

(1) It shall be divided by a longitudinal bulkhead or shifting boards, in line with, or not more than 5 percent of the molded breadth of the vessel from the center line or by longitudinal bulkheads or shifting boards off the center line of the vessel port and starboard, provided that the distance between them shall not exceed 60 percent of the molded breadth of the vessel. In every case the longitudinal bulkheads or shifting boards shall be properly constructed and shall extend from the bottom of the deck, as the case may be, to a height of not less than 2 feet above the surface of the bulk grain. In the case of vessels loaded with bulk grain other than linseed, in which a metacentric height (after correction for the free surface effects of liquids in tank) is maintained throughout the voyage of not less than 1¾ percent of the vessel's beam but not less than 12 inches in the case of one or two deck vessels, and not less than 2 percent of the vessel's beam but not less than 14 inches in the case of other vessels, longitudinal bulkheads or shifting boards may be omitted in way of the hatchway.

(2) The bulk grain shall be levelled and topped off with bagged grain or other suitable cargo tightly stowed and extending to a height of not less than 4 feet above the top of the bulk grain within spaces or portions of spaces divided by such longitudinal bulkheads or shifting boards, and not less than 5 feet within portions of spaces not so divided. The bagged grain or other suitable cargo shall be supported on suitable platforms laid over the whole surface of the bulk grain. Such platforms shall consist of bearers spaced not more than 4 feet apart and 1 inch boards laid thereon spaced not more than 4 inches apart, or of strong separation cloths with adequate overlapping.

(b) Unless stability data indicates that the metacentric height maintained throughout the voyage (after correction for the free surface effects of liquids in tanks) is at least 1¾ percent of the vessel's beam but not less than 12 inches in the case of one or two deck vessels, and not less than 2 percent of the vessel's beam but not less than 14 inches in the case of other vessels, not more than two holds or compartments shall be partly filled with bulk grain; except that other holds or compartments may be partly filled with bulk grain if they are filled up to the deckhead with bagged or other suitable cargo. For the purpose of this paragraph the following conditions apply:

(1) Superimposed tween decks shall be regarded as separate compartments and separate from any lower hold below them.

(2) Feeders and partly filled spaces, referred to in § 144.20-30(a)(2) shall not be regarded as compartments.

(3) Holds or compartments provided with one or more grain-tight longitudinal divisions shall be regarded as one hold or compartment.

§ 144.20-24 Exceptions to the requirements for longitudinal bulkheads.

(a) The fitting of longitudinal bulkheads or shifting boards in accordance with the provisions of § 144.20-10 and 144.20-22 is not required under the following conditions:

(1) In a lower hold (which term also includes the lower part of the hold of a single deck vessel) if the bulk grain therein does not exceed one-third of the capacity of the hold, or where such lower hold is divided by a shaft tunnel, one-half the capacity of that lower hold; or,

(2) In any space in a tween deck or superstructure provided that the wings are tightly stowed with bagged grain or other suitable cargo to a breadth on each side of not less than 20 percent of the breadth of the vessel in way thereof; or,

(3) In those parts of spaces where the maximum breadth of the deckhead within the said spaces does not exceed one-half of the molded breadth of the vessel.

§ 144.20-26 Trimming and bagging of end spaces.

(a) When the distance, measured in a fore and aft line, from any part of a hold or compartment to the nearest feeder exceeds 25 feet, the bulk grain in the end spaces beyond 25 feet from the nearest feeder shall be levelled off at a depth of at least 6 feet below the deck, and the end spaces filled with bagged grain built up on a suitable platform constructed as required in § 144.20-22(a)(2).

§ 144.20-28 Common loading.

(a) For the purpose of §§ 144.20-10 and 144.20-20 lower holds and tween deck spaces over them may be loaded as one compartment under the following conditions:

(1) The hatches to spaces so treated as common spaces shall be of such proportions and shall have sufficient volume within their coamings and above deck so as to serve as feeders, based upon the total volume of the common spaces served.

(2) Longitudinal bulkheads or shifting boards shall be fitted deck to deck, and in all cases for the full length of the space, in the tween deck of a vessel having two decks; in all other cases the longitudinal bulkheads or shifting boards shall be fitted for the upper third of the total depth of the common spaces.

(3) In order to secure an adequate flow of grain all spaces shall comply with the requirements of § 144.20-26. Additionally, openings shall be provided in the wings of the deck immediately below the uppermost deck forward and aft of the ends of the hatchways so as to provide in combination with the hatchways a maximum fore and aft feeding distance of 8 feet. Such openings shall be located approximately on the diagonal line between the hatch corners and the corners of the tween deck spaces.

(4) The metacentric height maintained throughout the voyage (after correction for the free surface effects of liquids in tanks) shall not be less than 1¾ percent of the vessel's beam but not less than 12 inches in the case of one or two deck vessels and not less than 2 percent of the vessel's beam but not less than 14 inches in the case of other vessels.

§ 144.20-30 Bulk grain in tween decks and superstructures.

(a) Bulk grain shall not be carried above deck, in the tween deck of a two-deck vessel, or in the upper tween deck of a vessel having more than two decks except under the following conditions:

(1) The bulk grain or other cargo shall be stowed so as to ensure maximum stability. The metacentric height maintained throughout the voyage (after correction for the free surface effects of liquids in tanks) shall not be less than 1¾ percent of the vessel's beam but not less than 12 inches in the case of one or two deck vessels, and not less than 2 percent of the vessel's beam but not less than 14 inches in the case of other vessels. Where specific data on metacentric height is not available, grain loaded above deck, in the tween deck of a two deck vessel, or in the uppermost tween deck of a vessel having more than two decks, shall not exceed 28 percent by weight of the total cargo below the space concerned; except that this limitation shall not apply when the grain carried above deck or in the uppermost tween deck is oats, barley, or cotton seed. The conditions in this subparagraph are in all cases subject to the additional condition that the master is satisfied that the ship will have adequate stability throughout the voyage.

(2) The deck area of any portion of the spaces referred to in this section which contains bulk grain and which is only partly filled shall not exceed 1,000 square feet.

(3) All spaces referred to in this section in which bulk grain is stowed shall be subdivided by transverse bulkheads at intervals of not more than 100 feet. When this distance is exceeded the excess space shall be entirely filled with bagged grain or other suitable cargo.

§ 144.20-32 Stowage of specially suitable ships.

(a) Ships which are generally of self-trimming type, specially designed and constructed for the carriage of bulk cargoes and having two or more vertical or sloping grain-tight longitudinal divisions suitably disposed to limit the effect of any transverse shift of grain, may carry bulk grain without regard to the requirements of §§ 144.20-10 through 144.20-30 subject however to compliance with the following requirements:

(1) As many holds and compartments as possible shall be full and trimmed full.

(2) For any specified arrangement of stowage the metacentric height at any stage of the voyage (after correction for the free surface effects of liquids in tanks) shall be sufficient so that the list resulting from the heeling moment due to the following assumed shift of grain shall not exceed 5 degrees or the angle at which one-half the freeboard is immersed, if less.

(3) In all holds and compartments, grain surfaces are assumed to settle 2 percent by volume and at a slope of 30 degrees under all surfaces which have an inclination of less than 30 degrees to the horizontal. All resulting grain free surfaces except those sloping opposite to the direction of list (i.e., sloping towards the high side after list) are assumed to shift to an angle of 12 degrees with the original horizontal.

(4) However, any grain surfaces which are overstowed in accordance with § 144.20–22 shall be assumed to shift after settling, to an angle of 8 degrees with the original horizontal.

(5) Where the metacentric height necessary to compliance with the provisions of this section is considered to be excessive, the design of vessel will be required to be suitably modified or stowage in accordance with §§ 144.20–10 through 144.20–30 will be required.

(6) Where acceptance under the provisions of this section is desired, calculations relative to the anticipated loading and to the foregoing stability requirements shall be submitted to the Commandant, U.S. Coast Guard, for approval prior to commencement of construction. These will be subject to confirmation by a stability test as provided in § 93.05–1 of Subchapter I (Cargo and Miscellaneous Vessels) of this chapter.

(b) Where considered necessary, supplementary conditions shall be required either with respect to the vessel's design and construction, or with respect to particular loading precautions to prevent shifting of grain.

§ 144.20–34 Stability conditions.

(a) It is a condition of acceptance of loading based upon the stability limits specified in this subpart that the vessel shall be supplied with plans and stability data, approved by the Commandant, including the following information:

(1) A capacity plan, including grain capacities and centers.

(2) The minimum acceptable GM when carrying grain.

(3) Stability data applicable to typical loading conditions for grain and other homogeneous cargoes when loaded at stowage factors of 45, 55, 65, 75 cubic feet per ton. Such data shall be given, in each case, both for typical departure and arrival conditions. Where an arrival condition includes salt water ballast, and an intermediate tankage condition results in a lesser GM, such intermediate condition shall also be given. In calculating the available GM, free surface allowance shall be made for all slack liquids, but in no case shall the free surface correction used be less than that corresponding to maximum free surface for the pair of tanks, port and starboard, of each type, having the largest free surface, plus the fuel oil settlers, plus the virtual free surface at 5 degrees heel for all nominally full fuel oil tanks (taken 98 percent full).

(4) To provide for conditions wherein shifting boards may be omitted, as provided by § 144.20–10(b)(2), grain free surface applicable to feeders not fitted with shifting boards shall be given. In order to provide flexibility in the subsequent selection of feeder arrangements, this free surface shall be presented as a function of the aggregate length of feeders, grain density, and vessel displacement rather than as just applying to any specific grain stowage arrangement.

(b) The stability information supplied specially suitable ships shall, in general, comply with this section subject to such modification as is necessary, having regard for their special arrangements.

(c) Double bottom tanks having a width measured at half length in excess of 60 percent of the vessel's molded breadth shall in no case be permitted. Such tanks shall therefore be divided by a watertight longitudinal division.

§ 144.20–36 Grain loading plans.

(a) Vessels carrying grain shall be loaded in accordance with grain loading plans bearing the approval of the National Cargo Bureau, Inc., or of another agency otherwise officially designated. A grain loading plan shall take into account the applicable requirements of this subchapter and shall indicate the main characteristics of the fittings used to prevent the shifting of cargo. It shall indicate the distribution and the circumstances of loading. Additionally, in all cases where approval is dependent upon the stability limits specified in this subpart, it shall, in conjunction with the information called for by § 144.20–34, indicate the applicable minimum GM and associated tankage conditions.

(b) A grain loading plan, in addition to the language in which it is given, shall be annotated in at least one other of the following languages: English, French, Spanish, or Russian.

(c) A copy of the grain loading plan shall be maintained at all times on the vessel. The master, if so required, shall produce it for the inspection of the appropriate authority of the port in which loading takes place.

(d) A grain loading plan and associated stability information approved for a vessel belonging to a country which is a party to the effective International Safety of Life at Sea Convention, issued either under the authority of the government of that country or under the authority of another government which is a party to that Convention upon the request of the first government, will be accepted by the United States. Other contracting governments have agreed to accept such information as evidence that the vessel, when loaded in accordance with this grain loading plan, meets the applicable grain loading requirements of the effective Convention.

(e) Vessels not having a grain loading plan approved in accordance with the paragraph (d) of this section may expect to be required to comply in detail with the rules of the country in which the loading port is situated.

Subpart 144.30—Vessels Shifting Ports

§ 144.30–1 Shifting vessels with part cargoes of loose grain in bulk.

(a) The regulations in this subpart shall apply to vessels loaded with part cargoes of loose grain in bulk shifting between ports for the purpose of loading additional cargo and modify certain requirements under Subpart 144.20. Masters of all vessels shifting ports under these modified requirements shall check with the Weather Bureau to ascertain the forecast of the weather to be encountered on the voyage and shall not proceed under these conditions when unusually adverse weather conditions are indicated.

(b) Vessels subject to the regulations in this part, moving between ports totally within the inland waters of the United States, may load any amount of loose grain in bulk without securing the grain provided shifting boards extend above the grain in each hold at least 2 feet. Vessels that have no longitudinal bulkheads or shifting boards in the lower holds shall comply with § 144.20–24(a)(1).

(c) Vessels shifting between United States ports along the east coast as far south as Cape Henry, between Gulf ports, between Puget Sound ports and West Coast Canadian ports, between Puget Sound ports and Columbia River ports, between San Francisco, Los Angeles Harbor and San Diego, or between Great Lakes ports and St. Lawrence River ports as far east as a straight line drawn from Cap de Rosiers to West Point, Anticosti Island, and on the north side of Anticosti Island following the 63d meridian may load the following amounts without securing the grain provided the grain is covered with dunnage boards placed fore and aft and athwartship:

(1) Any hold with less than 50 percent of its bulk grain capacity provided shifting boards extend above the grain in each hold at least 2 feet.

(2) One hold with more than 50 percent of its bulk grain capacity and one other hold with less than 50 percent of its bulk grain capacity provided shifting boards extend above the grain in each hold at least 2 feet.

(3) Where no longitudinal bulkheads or shifting boards are required to be erected, only two slack holds not exceeding the capacities specified in § 144.20–24(a)(1).

[F.R. Doc. 65–13936; Filed, Dec. 29, 1965; 8:45 a.m.]

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PART III

Small Business Administration

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System of Account Classifications for Small Business Investment Companies



Rules and Regulations

Title 13—BUSINESS CREDIT AND ASSISTANCE

Chapter I—Small Business Administration

[Rev. 2]

PART 111—SYSTEM OF ACCOUNT CLASSIFICATIONS FOR SMALL BUSINESS INVESTMENT COMPANIES

Pursuant to authority contained in section 308 of the Small Business Investment Act of 1958, Public Law 85–699, 72 Stat. 694, as amended, there is revised, as set forth below, Part 111 of Subchapter B, Chapter I of Title 13 of the Code of Federal Regulations, as published in 30 F.R. 4016–4040.

Information and effective date. On October 22, 1965, notice of proposed rule making was published in the FEDERAL REGISTER (30 F.R. 13486–13501) concerning the revision of the System of Account Classifications for Small Business Investment Companies (Part 111).

After due and careful consideration of the comments received, the Administration has determined to adopt Revision 2 of Part 111, set forth below, as being in furtherance of the best interests of the SBIC program.

The present revision, which shall become effective April 1, 1966, incorporates the text of the proposals published on October 22, 1965, except for the following changes:

1. Four principal accounts have been added and one eliminated, thus causing the final reduction in the number of principal accounts to be from 172 in Revision 1 to 118 in Revision 2.

2. The series of account numbers for deposits in banks has been changed from 100–102 to 100–108.

3. The accounts for time deposits in banks, evidenced by time certificates of deposit, have been moved from the category of cash on hand and in banks to the category of investments in U.S. Government securities, insured savings accounts, and time certificates of deposit.

4. The wording of the texts of accounts Nos. 151, Allowance for Uncollectible Notes and Accounts Receivable, and 171, Allowance for Uncollectible Loans (section 305), has been amended to conform with the other allowance for losses accounts by indicating that the accounts will reflect the best available estimate of probable losses on the related assets.

5. A credit item has been added to each of the asset accounts for loans and debt securities to be contra to debit item (a) of the respective accounts for loans and debt securities sold with recourse.

6. The accounts for capital stock subscriptions receivable have been included in the capital stock category of accounts.

7. Account No. 354, Estimated Income Taxes Accrued, has been provided with subaccounts to permit separate accounting for accruals of Federal, State, city, and other income taxes. Related accounts Nos. 720, Income Taxes—Net Income, and 722, Income Taxes—Net Realized Gain on Investments, have also been provided with subaccounts to permit separate accounting for Federal, State, city, and other income tax expenses.

8. Separate accounts provided for unearned discount, fees, and other charges on loans, and on debt securities, have been moved from the category of other liabilities and deferred credits to the categories for loans and for debt securities, respectively.

9. Debit item (c) of account No. 425, Retained Earnings, has been changed to indicate that stock dividends may be issued at a per share value representing the higher of fair value or average paid-in capital per share, rather than at not less than average paid-in capital per share.

10. Account No. 534, Investigation and Service Fees Charged Other Lenders, has been amended to include compensation for financial services rendered in connection with participations sold.

11. Debit item (a) of account No. 579, Gain on Other Assets, and credit item (a) of account No. 709, Loss on Other Assets, have been changed to indicate that these accounts are closed into the realized gain and loss summary at the end of the fiscal year, rather than into the profit and loss summary.

12. The title and text of account No. 651 have been changed to exclude financial service costs from this operating account. The new title is "Appraisal and Investigation Costs."

13. Separate accounts for insurance and for advertising and promotional costs, proposed to be eliminated, have been restored.

14. The separate account for miscellaneous services and supplies has been eliminated, with the information previously recorded therein now to be reflected in account No. 679, Miscellaneous Operating Expenses. The text of the latter account has been amended further to provide for expenses incurred under contracts for management of the company, and for dues, subscriptions, donations, etc.

15. In the October 22, 1965, proposals the eight expense accounts providing for losses were combined into one account. In this finalized revision, the following two accounts are established: No. 680, Estimated Losses on Receivables, and No. 682, Estimated Losses on Loans, Investments, and Other Assets.

16. A new nominal asset account has been added to the Memorandum Records to reflect undisbursed commitments from SBA.

Dated: December 23, 1965.

ROSS D. DAVIS,
Executive Administrator.

General Instructions

1. This system of account classifications for small business investment companies (effective April 1, 1966) is adaptable to manual or machine accounting procedures employing the double-entry method, and is otherwise designed to meet the specific needs of companies licensed in accordance with the provisions of the Small Business Investment Act of 1958, as amended.

2. Account classifications in use by companies licensed prior to issuance of this revised system shall be converted to the classifications set forth herein as of April 1, 1966. A small business investment company which considers that it needs one or more additional accounts may submit a detailed description of the proposed account(s) to SBA for consideration, and, upon receipt of written approval thereof, may incorporate such additional accounts into its accounting system.

3. Subdivisions of any account in this system of account classifications may be kept in the general ledger without the prior approval of SBA, provided that such subaccounts do not impair the integrity of the accounts set forth in the prescribed system. All such subaccounts shall refer by number and title to the accounts of which they are subdivisions, and a description of such subaccounts shall be furnished to SBA promptly upon their establishment. Use of a decimal system is required for extending the account numbers to identify such subaccounts.

4. This account classifications system provides for two-digit number designations for major categories under which accounts are listed, and three-digit number designations for individual general ledger accounts. The first two digits of an individual account number refer to the major category under which the account is classified and the third digit identifies the specific account. Digits from zero through nine are used to identify specific accounts. For example, the first deposit bank account established will be designated "100" and the second "101." It will be noted that some categories encompass individual accounts in sufficient number to require assignment of more than one two-digit number to identify the category. For example, "Cash on Hand and in Banks" has been assigned category numbers "10," "11," and "12."

5. Books of account shall be maintained on an accrual basis and, at the end of each month, all transactions and accruals applicable to the month, as nearly as may be ascertained, shall be entered in the books.

6. It is very important that complete and accurate records of all nominal assets and contingent liabilities be maintained. This is especially true with respect to outstanding commitments (1) to finance small business concerns

through loans to them or the acquisition of their equity securities, and (2) to make funds available to other lenders through deferred participations. A section providing for the maintenance of appropriate memorandum records is included herein, covering nominal assets, contingent liabilities, and options on the capital stock of the small business investment company.

7. Each small business investment company shall keep its books of account, and all other books, records, and memoranda which support in any way the entries in its books of account, in such manner as to be able readily to furnish full information on any item included in any account. The books and records referred to herein include not only accounting records in a limited technical sense, but all other records, such as minute books, capital stock records, reports, correspondence, and memoranda which may be useful in developing the history of, or facts regarding, any transaction.

8. Nothing contained in this system of account classifications can or is intended to authorize or approve any operation or action by a Licensee, or any other, not authorized or approved by the Small Business Investment Act of 1958, as amended.

ASSET AND VALUATION ACCOUNTS

10–12—Cash on Hand and in Banks

100–108 Deposits in _____ bank.
110–112 Deposits in imprest account in _____ bank.
118 Cash items in process of collection.
120 Petty cash fund.

13—Investments in U.S. Government Securities, Insured Savings Accounts, and Time Certificates of Deposit

130 U.S. Government obligations, direct and fully guaranteed.
131 Insured savings accounts.
135–137 Time deposits in _____ bank.

14–15—Notes and Accounts Receivable

140 Notes receivable.
150 Accounts receivable.
151 Allowance for uncollectible notes and accounts receivable.

16—Accrued Interest Receivable

160 Accrued interest receivable.
161 Allowance for uncollectible interest receivable.

17—Loans to Small Business Concerns

170 Loans (section 305).
171 Allowance for uncollectible loans (section 305).
173 Unearned discount, fees, and other charges on loans (section 305).
179 Funds in escrow pending closing of financing.

18—Debt Securities of Small Business Concerns

180 Debt securities, convertible, and with stock purchase warrants or options (section 304).
184 Debt securities divested of stock rights (section 304).
185 Allowance for losses on debt securities (section 304).
187 Unearned discount, fees, and other charges on debt securities (section 304).

19—Capital Stock and Stock Rights of Small Business Concerns

190 Capital stock of SBCs, convertible, and with stock purchase warrants or options.
192 Capital stock of SBCs—other.
193 Allowance for losses on capital stock of SBCs.
196 Warrants, options, and other stock rights acquired from SBCs.
197 Allowance for losses on warrants, options, and other stock rights acquired from SBCs.

20—Assets Acquired in Liquidation of Loans and Debt Securities

200 Assets acquired in liquidation of loans and debt securities.
201 Allowance for losses on assets acquired in liquidation of loans and debt securities.
203 Accumulated depreciation on assets acquired in liquidation of loans and debt securities.

22—Prepaid Expenses and Deferred Charges

220 Prepaid expenses and deferred charges.

23—Furniture and Equipment

230 Furniture and equipment.
231 Accumulated depreciation on furniture and equipment.

24—Corporate Premises Owned

240 Corporate premises owned.
241 Accumulated depreciation on corporate premises owned.
242 Leasehold improvements.

25—Other Assets

255 Amounts due from directors, officers, and employees.
256 Organization costs.
257 Other assets.

LIABILITY ACCOUNTS

30—Notes and Other Obligations Payable to SBA for Funds Borrowed

300 Notes payable to SBA.
302 Debentures payable, subordinated, issued to SBA.

31—Notes and Other Obligations Payable to Other than SBA for Funds Borrowed

310 Loans sold with recourse.
312 Debt securities, convertible, and with stock purchase warrants or options sold with recourse.
314 Debt securities divested of stock rights sold with recourse.
315 Notes payable to other than SBA—guaranteed by SBA.
316 Notes payable to other than SBA—not guaranteed by SBA.
317 Mortgages payable for funds borrowed.
318 Mortgages payable on assets acquired in liquidation of loans and debt securities.

32—Notes Payable—Other

320 Notes payable—other.

34—Accounts Payable

340 Accounts payable.

35—Accrued Expenses Payable

350 Accrued interest payable.
351 Accrued taxes on payroll.
354 Estimated income taxes accrued.
358 Other accrued expenses.

36—Dividends Payable

360–364 Dividends payable on _____ (Type and class) _____ capital stock.

37—Deposit Liabilities

370 Employee taxes withheld.
374 Unapplied receipts.
378 Miscellaneous trust receipts.

38—Other Liabilities and Deferred Credits

381 Other liabilities.
383 Other deferred credits.

CAPITAL STOCK AND SURPLUS ACCOUNTS

40–41—Capital Stock

400–404 _____ (Type and class) capital stock authorized.
405–409 _____ (Type and class) unissued capital stock.
410–411 _____ (Type and class) capital stock subscribed.
413–414 Capital stock subscriptions receivable _____ (Type and class)
415–419 Treasury stock _____ (Type and class)

42—Surplus

420 Paid-in surplus.
425 Retained earnings.
427 Appropriated retained earnings.
429 Profit and loss summary.
430 Realized gain and loss summary.

INCOME ACCOUNTS

50—Commitment Income

500 Commitment income.

51–52—Interest Income

504 Interest on invested idle funds.
512 Interest on loans.
516 Interest on debt securities.
520 Interest income—other.

53—Fee Income

532 Management consulting service fees.
534 Investigation and service fees charged other lenders.
536 Application and appraisal fees.

54—Dividends and Other Earnings

540 Dividends on capital stock of SBCs.
541 Sharings in income of SBCs.

57—Gain on Securities and Other Assets

570 Gain on U.S. Government securities.
572 Gain on debt securities (section 304).
576 Gain on capital stock of SBCs.
577 Gain on warrants, options, and other stock rights acquired from SBCs.
578 Gain on assets acquired in liquidation of loans and debt securities.
579 Gain on other assets.

58—Miscellaneous Income

582 Income from assets acquired in liquidation of loans and debt securities.
584 Other income.

EXPENSE ACCOUNTS

60—Commitment Expense

600 Commitment expense.

61–62—Interest Expense

610 Interest on obligations payable to SBA.
622 Interest on obligations payable to other than SBA.

64—Stock Record and Other Financial Expenses

642 Stock record and other financial expenses.

65–67—Operating Expenses

650–679 Operating expenses.
650 Advertising and promotional costs.
651 Appraisal and investigation costs.
652 Auditing and examination costs.
653 Communications.
654 Cost of space occupied.
655 Depreciation of corporate premises owned, furniture, and equipment.
657 Directors' and stockholders' meetings costs.
658 Insurance.
660 Investment adviser costs.
661 Legal services.
663 Salaries.
664 Taxes, excluding income taxes.
665 Travel.
670 Employee benefits expense.
672 Organization expense.
679 Miscellaneous operating expenses.

68—Estimated Losses on Receivables, Investments, and Other Assets

680 Estimated losses on receivables.
682 Estimated losses on loans, investments, and other assets.

70—Loss on Securities and Other Assets

700 Loss on U.S. Government securities.
702 Loss on debt securities (section 304).
706 Loss on capital stock of SBCs.
707 Loss on warrants, options, and other stock rights acquired from SBCs.
708 Loss on assets acquired in liquidation of loans and debt securities.
709 Loss on other assets.

71—Miscellaneous Expenses

710 Expense on assets acquired in liquidation of loans and debt securities.
715 Other expenses.

72—Income Taxes

720 Income taxes—net income.
722 Income taxes—net realized gain on investments.

MEMORANDUM RECORDS

Nominal Assets

NA–10 Stock purchase warrants or options on stock of SBC's.
NA–12 Undisbursed commitment from SBA.

Contingent Liabilities

CL–16 Commitments outstanding.
CL–17 Other contingent liabilities.

Options on Company's Stock

OCS–1 Options on company's stock.

ASSET AND VALUATION ACCOUNTS

100–108 Deposits in _____ bank.

These accounts will represent funds on demand deposit in banks which are members of the Federal Deposit Insurance Corporation.

Debit: (a) With amount of funds deposited.

Credit: (a) With amount of funds withdrawn, and charges made by bank for such items as dishonored checks, transfer of funds by wire, collection, exchange, etc.

110–112 Deposits in imprest account in _____ bank.

These accounts will represent funds on demand deposit in imprest bank accounts to be drawn upon for the payment of operating expenses and to be reimbursed periodically through deposit therein of a check requiring dual signatures and drawn on the company's general funds bank account.

Debit: (a) With amount of funds deposited.

Credit: (a) With amount of funds withdrawn.

118 Cash items in process of collection.

This account will represent the amount of cash items placed with banks for collection.

Debit: (a) With amount of such items placed with banks for collection.

Credit:

(a) With amount of items collected.

(b) With amount of uncollected items returned or withdrawn.

120 Petty cash fund.

This account will represent the imprest petty cash fund maintained for the purpose of making small disbursements.

Debit:

(a) With amount placed in the fund when established.

(b) With amount of increase in the fund.

Credit: (a) With amount of decrease in the fund.

NOTE: The petty cash fund may be reimbursed and expenditures recorded as often as circumstances require, but must be reimbursed at the close of the company's fiscal year. Checks to replenish the fund will be drawn on a general fund bank account and include "petty cash" as a payee. Debits totaling the amount of this replenishment should be made concurrently to the appropriate accounts.

130 U.S. Government obligations, direct and fully guaranteed.

This account will represent the cost of temporary investments made from general cash funds in direct obligations of the U.S. Government and obligations guaranteed as to principal and interest by the U.S. Government. When U.S. Savings Bonds redeemable at par value on maturity are purchased at less than face value, the increase in redemption value may be periodically charged to this account with concurrent credit to account No. 504—Interest on invested idle funds.

Debit:

(a) With cost of such securities acquired.

(b) With increase in redemption value of U.S. Savings Bonds.

Credit:

(a) With redemption value of U.S. Savings Bonds redeemed.

(b) With cost of such securities sold or disposed of otherwise.

NOTE: Increase in value over cost of U.S. Treasury bills, which are issued at a discount and are noninterest bearing, will not be reflected in this account but will be debited at the end of each month to account No. 160—Accrued interest receivable, with concurrent credit to account No. 504—Interest on invested idle funds.

(See accounts Nos. 570 and 700)

131 Insured savings accounts.

This account will include the balances in subaccounts Nos. 131.1, 131.2, etc.

131.1 Insured savings in _____.

This account will represent funds invested in an insured savings account in an institution the accounts of which are insured by the Federal Savings and Loan Insurance Corporation.

Debit:

(a) With amount of funds invested.

(b) With amount of dividends earned on such invested funds.

Credit: (a) With amount of funds withdrawn.

135–137 Time deposits in _____ bank.

These accounts will represent funds on time deposit in banks which are members of the Federal Deposit Insurance Corporation.

Debit: (a) With amount of funds deposited.

Credit: (a) With amount of funds withdrawn.

140 Notes receivable.

This account will represent the unpaid balance of miscellaneous notes receivable, including notes representing amounts due from debtors on sale of assets acquired in liquidation of loans and debt securities.

Debit: (a) With amount of such miscellaneous notes received.

Credit:

(a) With amount collected on principal of such miscellaneous notes.

(b) With unpaid principal balance written off or disposed of otherwise.

NOTE: Recording as income of amounts entered in this account should be discontinued with respect to any small business concern which is in bankruptcy, or on the verge thereof, or otherwise considered to be insolvent. The amounts in question should be credited as deferred income in account No. 383—Other deferred credits, pending determination of the appropriate accounting. In less serious situations, when the debtor small business concern has not earned the amount of the receivable, or the fair value of its debt or equity instruments held by the company, as determined by the Board of Directors, is less than cost, or recovery thereon is doubtful, an addition to the allowance for uncollectible notes and accounts receivable should be made in an amount equivalent to the receivable entered in this account, or, as an alternative, the receivable recorded as an asset should be concurrently credited as deferred income to account No. 383 as above indicated.

(See account No. 151)

150 Accounts receivable.

This account will represent the amount due on open account for advisory, consulting, appraisal, and miscellaneous services rendered; declared dividends receivable on capital stock of small business concerns; amounts receivable representing sharings in the income of small business concerns; amounts due from debtors on sale of assets acquired in liquidation of loans and debt securities; amounts representing "participating" companies' portions of accrued principal and interest receivable from financed small business concerns; and miscellaneous current receivables.

The account also will include the amount of accrued compensation receivable for services rendered to "participating" companies and the amount of accrued commitment fees receivable for making funds available on a deferred

basis to small business concerns and to "initiating" companies in connection with the latter's financing of small business concerns.

Debit: (a) With amount due the company.

Credit:

(a) With amount collected.

(b) With amount written off or disposed of otherwise.

NOTE: Recording as income of amounts entered in this account should be discontinued with respect to any small business concern which is in bankruptcy, or on the verge thereof, or otherwise considered to be insolvent. The amounts in question should be credited as deferred income in account No. 383—Other deferred credits, pending determination of the appropriate accounting. In less serious situations, when the debtor small business concern has not earned the amount of the receivable, or the fair value of its debt or equity instruments held by the company, as determined by the Board of Directors, is less than cost, or recovery thereon is doubtful, an addition to the allowance for uncollectible notes and accounts receivable should be made in an amount equivalent to the receivable entered in this account, or as an alternative, the receivable recorded as an asset should be concurrently credited as deferred income to account No. 383 as above indicated.

(See account No. 151)

151 Allowance for uncollectible notes and accounts receivable.

This account will represent the valuation reserve provided for estimated losses on notes and accounts receivable and should be maintained in an amount not less than a conservative estimate of probable losses. This valuation reserve will be adjusted as occasion demands, so that this account will reflect the best available estimate of probable losses on notes and accounts receivable.

Debit:

(a) With amount of decreases in such reserve.

(b) With amount of notes and accounts receivable written off.

Credit:

(a) With amount of such reserve established.

(b) With amount of increases in such reserve.

(c) With amount of recoveries on notes and accounts receivable written off.

NOTE: When a note receivable or an account receivable is recorded with respect to any debtor small business concern which has not earned the amount thereof, or the fair value of whose debt or equity instruments held by the company, as determined by the Board of Directors, is less than cost, or recovery thereon is doubtful, an addition to the allowance for uncollectible notes and accounts receivable reflected in this account should be made in an amount equivalent to the recorded receivable, or, as an alternative, the amount of the receivable recorded as an asset should be concurrently credited as deferred income in account No. 383—Other deferred credits, pending determination of the appropriate accounting.

(See accounts Nos. 140, 150, and 680)

160 Accrued interest receivable.

This account will represent the amount of interest accrued on loans to and debt securities of small business concerns, United States Government obligations direct and fully guaranteed, notes receivable, sales contracts, and other interest-bearing amounts due from debtors, including funds placed in escrow pending the closing of financing.

Debit:

(a) With amount of accrued interest purchased, at date interest-bearing obligations are acquired.

(b) At the end of each month, with amount of interest accrued on all items covered by this account on that date.

(c) With amount of interest accrued during the month on such items disposed of during the month.

Credit:

(a) With amount of interest payments received.

(b) With amount of accrued interest transferred to assets acquired in liquidation of loans and debt securities.

(c) Upon disposition of interest-bearing obligations, with amount of accrued interest thereon included in this account.

(d) With amount of accrued interest written off or disposed of otherwise.

NOTE 1: At the option of the company, interest payments received in cash from debtors prior to the interest maturity date may be credited to account No. 374—Unapplied receipts, until the maturity date.

NOTE 2: Accrual of interest receivable should be discontinued with respect to any loan or debt security financing a small business concern which is in bankruptcy, or on the verge thereof, or otherwise considered to be insolvent. Any interest payments received from such a debtor should not be treated as interest income, but should be either credited as payments on principal of the debt or credited as deferred income in account No. 383—Other deferred credits, pending determination of the appropriate accounting. In less serious situations, when interest receivable is accrued under circumstances in which the financed small business concern has not earned the amount thereof, or the fair value of the loan or debt security as determined in good faith by the Board of Directors is less than cost, or recovery thereon is doubtful, an addition to the allowance for uncollectible interest receivable should be made in an amount equivalent to the accrual of interest receivable, or, as an alternative, the interest income should be deferred in account No. 383 as above indicated.

(See account No. 161)

161 Allowance for uncollectible interest receivable.

This account will represent the valuation reserve provided for estimated losses of accrued interest receivable, and should be maintained in an amount not less than a conservative estimate of probable losses. This valuation reserve will be adjusted as occasion demands, so that this account will reflect the best available estimate of probable losses of accrued interest receivable.

Debit:

(a) With amount of decreases in such reserve.

(b) With amount of accrued interest receivable written off.

Credit:

(a) With amount of such reserve established.

(b) With amount of increases in such reserve.

(c) With amount of recoveries of accrued interest receivable written off.

NOTE: When interest receivable is accrued under circumstances in which the financed small business concern has not earned the amount thereof, or the fair value of the loan or debt security as determined in good faith by the Board of Directors is less than cost, or recovery thereon is doubtful, an addition to the allowance for uncollectible interest receivable reflected in this account should be made in an amount equivalent to the accrual of interest receivable, or, as an alternative, the interest income should be deferred in account No. 383—Other deferred credits, pending determination of the appropriate accounting.

(See accounts Nos. 160 and 680)

170 Loans (section 305).

This account will represent the unpaid principal balance of loans made to small business concerns pursuant to section 305 of the Small Business Investment Act of 1958, as amended.

Debit:

(a) With face amount of direct loans.

(b) With portion retained by company of loans in which participations are sold to others.

(c) With amount of participations in loans of others.

(d) With unpaid principal of loans represented by renewal notes accepted or notes taken in substitution for those held.

(e) With reversal of prior credits when checks received representing repayments are dishonored, etc.

Credit:

(a) With amount collected on face amount of direct loans.

(b) With company's share of amount collected on principal of loans in which participations are sold to others.

(c) With amount by which participations in loans of others are reduced by repayments transmitted by the "initiating" company.

(d) With amount collected on principal of loans sold with recourse as reported to the company by the purchaser (contra debit will be made to account No. 310).

(e) With unpaid principal of loans represented by notes renewed or for which other notes have been substituted.

(f) With amount transferred to assets acquired in liquidation of loans and debt securities.

(g) With unpaid principal of loans written off or disposed of otherwise.

NOTE 1: A participation is defined as an undivided interest shared with one or more other lenders or investors in a note, debenture, certificate of stock, or other instrument evidencing a loan to, or equity financing of, a small business concern.

NOTE 2: It is assumed that in all loan participation arrangements the "initiating" company will service the loans.

NOTE 3: It is recommended that individual loan ledger cards or sheets be maintained for all loans. Such ledger cards or sheets should contain the detailed information needed for account No. 173—Unearned discount, fees, and other charges on loans (section 305), and for activities pertaining to participations purchased or sold.

(See accounts Nos. 171 and 310)

171 Allowance for uncollectible loans (section 305).

This account will represent the valuation reserve provided for estimated losses on loans (section 305) and should be maintained in an amount not less than a conservative estimate of probable losses. This valuation reserve will be adjusted as occasion demands, so that this account reflects the best available estimate of probable losses on loans to small business concerns.

Debit:

(a) With amount of decreases in such reserve.

(b) With amount of such loans written off.

Credit:

(a) With amount of such reserve established.

(b) With amount of increases in such reserve.

(c) With amount of recoveries on such loans written off.

(See accounts Nos. 170 and 682)

173 Unearned discount, fees, and other charges on loans (section 305).

This account will represent the amount of unearned discount, fees, and other charges included in the face amount of loans made to small business concerns pursuant to section 305 of the Small Business Investment Act of 1958, as amended, and which is withheld from disbursements to such small business concerns.

Debit:

(a) With amount of unearned discount, fees, and other charges included in the face amount of loans, but withheld from disbursements to debtor small business concerns, which becomes earned through collection or passage of time.

(b) With amount earned of that portion of unearned discount, fees, and other charges included in the face amount of loans, but withheld from disbursements to debtor small business concerns, which is retained by the company in connection with loans participated in by other lenders (the amount to be recorded becomes earned through collection or passage of time).

(c) With amount earned of that portion of unearned discount, fees, and other charges included in the face amount of loans, but withheld from disbursements to debtor small business concerns, which is assigned to the company in connection with its participations in loans of other lenders (the amount to be recorded becomes earned through collection or passage of time).

(d) With amount of unearned discount, fees, and other charges included in the face amount of loans, but withheld from disbursements to debtor small business concerns, which is rebated to borrowers upon early repayment of loans, or is closed into the asset account upon liquidation of loans at less than full amount.

Credit:

(a) With amount of unearned discount, fees, and other charges included in the face amount of loans but withheld from disbursements to debtor small business concerns.

(b) With portion retained by the company of total amount of unearned discount, fees, and other charges included in the face amount of loans, but withheld from disbursements to debtor small business concerns, in connection with loans participated in by other lenders.

(c) With portion assigned to the company of total amount of unearned discount, fees, and other charges included in the face amount of loans, but withheld from disbursements to debtor small business concerns, in connection with its participations in loans of other lenders.

NOTE 1: A participation is defined as an undivided interest shared with one or more other lenders or investors in a note, debenture, certificate of stock, or other instrument evidencing a loan to, or equity financing of, a small business concern.

NOTE 2: Unearned discount in this account will be transferred, as appropriate, to account No. 512—Interest on loans, as it becomes earned, and unearned fees and other charges will be transferred to account No. 536—Application and appraisal fees, under similar circumstances.

NOTE 3: Any fees and other charges considered earned immediately upon closing of loans will be recorded in the income account at once without first being entered in this account.

NOTE 4: Appropriate subsidiary records should be maintained for all unearned amounts included in this account to permit identification of such amounts with the particular loans to which they relate.

179 Funds in escrow pending closing of financing.

This account will represent the amount of funds placed in escrow pending the closing of financing for small business concerns.

Debit: (a) With amount of funds placed in escrow.

Credit: (a) With amount of funds withdrawn from escrow.

180 Debt securities, convertible, and with stock purchase warrants or options (section 304).

This account will represent the unpaid principal balance of small business concerns' debt securities, convertible, and with attached stock purchase warrants or options, acquired by the company pursuant to section 304 of the Small Business Investment Act of 1958, as amended. If the stock purchase warrants, options, or other stock rights have a separate purchase cost, or if a separate cost has otherwise been determined for them, the warrants, options, or other stock rights will be reflected at such cost in account No. 196.

Debit:

(a) With face amount of debt securities, convertible, and with stock purchase warrants or options, acquired.

(b) With portion retained by company of debt securities, convertible, and with stock purchase warrants or options, in which participations are sold to others.

(c) With amount of participations in purchases by others of debt securities, convertible, and with stock purchase warrants or options.

(d) With reversal of prior credits when checks received representing repayments are dishonored, etc.

Credit:

(a) With amount collected on face amount of debt securities, convertible, and with stock purchase warrants or options.

(b) With company's share of amount collected on principal of debt securities, convertible, and with stock purchase warrants or options, in which participations are sold to others.

(c) With amount by which participations in purchases by others of debt securities convertible, and with stock purchase warrants or options, are reduced by repayments transmitted by the "initiating" company.

(d) With unpaid principal balance of debt securities, convertible, and with stock purchase warrants or options, sold with recourse paid on maturity as reported to the company by the purchaser (contra debit will be made to account No. 312).

(e) With unpaid principal of debt securities, convertible, and with stock purchase warrants or options, or portions thereof, converted into capital stock.

(f) With unpaid principal of debt securities, convertible, and with stock purchase warrants or options, which have been divested of stock rights through (1) the expiration of the conversion privilege, (2) the exercise or the expiration of rights conveyed by nondetachable or detachable stock purchase warrants or options, or (3) the detachment of detachable stock purchase warrants or options.

(g) With unpaid principal of debt securities, convertible, and with stock purchase warrants or options, transferred to assets acquired in liquidation of loans and debt securities.

(h) With unpaid principal of debt securities, convertible, and with stock purchase warrants or options, written off or disposed of otherwise.

NOTE 1: A participation is defined as an undivided interest shared with one or more other lenders or investors in a note, debenture, certificate of stock, or other instrument evidencing a loan to, or equity financing of, a small business concern.

NOTE 2: It is assumed that in all arrangements for participation in the purchase of debt securities, convertible, and with stock purchase warrants or options, the "initiating" company will service the financing.

NOTE 3: It is recommended that individual ledger cards or sheets be maintained for all debt securities, convertible, and with stock purchase warrants or options. Such ledger cards or sheets should contain the detailed information needed for account No. 187—Unearned discount, fees, and other charges on debt securities (section 304), and for activities pertaining to participations purchased or sold.

(See accounts Nos. 184, 185, 312, and memorandum record No. NA-10)

184 Debt securities divested of stock rights (section 304).

This account will represent the unpaid principal balance of small business concerns' debt securities which have been divested of stock rights through (1) the expiration of the conversion privilege of convertible debt securities, (2) the ex-

ercise or the expiration of rights conveyed by nondetachable or detachable stock purchase warrants or options of debt securities, or (3) the detachment of detachable stock purchase warrants or options, obtained in connection with the acquisition of debt securities pursuant to section 304 of the Small Business Investment Act of 1958, as amended.

Debit:

(a) With unpaid principal of debt securities divested of stock rights through (1) the expiration of the conversion privilege, (2) the exercise or the expiration of rights conveyed by nondetachable or detachable stock purchase warrants or options, or (3) the detachment of detachable stock purchase warrants or options.

(b) With company's retained portion of debt securities participated in by others which have been subsequently divested of stock rights.

(c) With amount of participations in purchases by others of debt securities which have been subsequently divested of stock rights.

(d) With reversal of prior credits when checks received representing repayments are dishonored, etc.

Credit:

(a) With amount collected on face amount of debt securities divested of stock rights.

(b) With company's share of amount collected on principal of debt securities participated in by others which have been subsequently divested of stock rights.

(c) With full amount by which participations in purchases by others of debt securities which have been subsequently divested of stock rights are reduced by repayments transmitted by the "initiating" company.

(d) With unpaid principal balance of debt securities divested of stock rights sold with recourse paid on maturity as reported to the company by the purchaser (contra debit will be made to account No. 314).

(e) With unpaid principal of debt securities divested of stock rights transferred to assets acquired in liquidation of loans and debt securities.

(f) With unpaid principal of debt securities divested of stock rights written off or disposed of otherwise.

NOTE: It is recommended that individual ledger cards or sheets be maintained for all debt securities which have been divested of stock rights. Such ledger cards or sheets should contain the detailed information needed for account No. 187—Unearned discount, fees, and other charges on debt securities (section 304), and for activities pertaining to participations purchased or sold.

(See accounts Nos. 180, 185, and 314)

185 Allowance for losses on debt securities (section 304).

This account will represent the valuation reserve provided for estimated losses on debt securities, convertible, and with stock purchase warrants or options, and debt securities divested of stock rights (all such securities section 304) and should be maintained in an amount not less than a conservative estimate of probable losses. This valuation reserve will be adjusted as occasion demands, so that this account will reflect the best available estimate of probable losses on debt securities of small business concerns.

Debit:

(a) With amount of decreases in such reserve.

(b) With amount of reserve established in this account for debt securities which are written off, sold, or disposed of otherwise (contra credit for any portion representing an excess over losses actually incurred will be made to account No. 682).

(c) With amount of write-down of such debt securities, not to exceed the amount of reserve established therefor in this account.

Credit:

(a) With amount of such reserve established.

(b) With amount of increases in such reserve.

NOTE: When debt securities of small business concerns are sold by the company or disposed of otherwise, cash or other appropriate asset account will be debited for the amount received, this account will be debited for the amount of the reserve which has been established therein for such debt securities, and the appropriate investment account will be credited for the related cost value carried therein. If there is no loss, or it is less than the amount reserved for loss on the debt securities disposed of, the excess portion of the amount reserved will be credited to account No. 682. If a gain over cost is realized, such gain will be credited to account No. 572. If a loss in relation to cost is sustained which is in excess of the amount reserved therefor, that portion above the amount of the reserve provided will be debited to account No. 702.

(See accounts Nos. 180 and 184)

187 Unearned discount, fees, and other charges on debt securities (section 304).

This account will represent the amount of unearned discount, fees, and other charges included in the face amount of small business concerns' debt securities acquired pursuant to section 304 of the Small Business Investment Act of 1958, as amended, and which is withheld from disbursements to such small business concerns.

Debit:

(a) With amount of unearned discount, fees, and other charges included in the face amount of debt securities, but withheld from disbursements to debtor small business concerns, which becomes earned through collection or passage of time.

(b) With amount earned of that portion of unearned discount, fees, and other charges included in the face amount of debt securities, but withheld from disbursements to debtor small business concerns, which is retained by the company in connection with purchases of debt securities participated in by other investors (the amount to be recorded becomes earned through collection or passage of time).

(c) With amount earned of that portion of unearned discount, fees, and other charges included in the face amount of debt securities, but withheld from disbursements to debtor small business concerns, which is assigned to the company in connection with its participations in purchases of debt securities by other investors (the amount to be recorded becomes earned through collection or passage of time).

(d) With amount of unearned discount, fees, and other charges included in the face amount of debt securities, but withheld from disbursements to debtor small business concerns, which is rebated to borrowers upon early repayment of debt securities, or is closed into the asset account upon liquidation of debt securities at less than full amount.

Credit:

(a) With amount of unearned discount (including that equivalent to the determined cost of warrants, options, and other stock rights, as explained in Note 2 of account No. 196), fees, and other charges included in the face amount of debt securities but withheld from disbursements to debtor small business concerns.

(b) With portion retained by the company of total amount of unearned discount, fees, and other charges included in the face amount of debt securities, but withheld from disbursements to debtor small business concerns, in connection with purchases of debt securities participated in by other investors.

(c) With portion assigned to the company of total amount of unearned discount, fees, and other charges included in the face amount of debt securities, but withheld from disbursements to debtor small business concerns, in connection with its participations in purchases of debt securities by other investors.

NOTE 1: A participation is defined as an undivided interest shared with one or more other lenders or investors in a note, debenture, certificate of stock, or other instrument evidencing a loan to, or equity financing of, a small business concern.

NOTE 2: Unearned discount in this account will be transferred, as appropriate, to account No. 516—Interest on debt securities, as it becomes earned, and unearned fees and other charges will be transferred to account No. 536—Application and appraisal fees, under similar circumstances.

NOTE 3: Any fees and other charges considered earned immediately upon closing of financing through purchase of debt securities will be recorded in the income account at once without first being entered in this account.

NOTE 4: Appropriate subsidiary records should be maintained for all unearned amounts included in this account to permit identification of such amounts with the particular debt securities to which they relate.

190 Capital stock of SBC's, convertible, and with stock purchase warrants or options.

This account will represent the value at cost of small business concerns' capital stock, convertible, and with attached stock purchase warrants or options, acquired by the company pursuant to section 304 of the Small Business Investment Act of 1958, as amended. If the stock purchase warrants, options, or

other stock rights have a separate purchase cost, or if a separate cost has otherwise been determined for them, the warrants, options, or other stock rights will be reflected at such cost in account No. 196.

Debit:

(a) With cost of such capital stock of SBC's, convertible, and with stock purchase warrants or options, acquired.

(b) With portion retained by company of the capital stock of SBC's, convertible, and with stock purchase warrants or options, in which participations are sold to others.

(c) With amount of participations in acquisitions by others of capital stock of SBC's, convertible, and with stock purchase warrants or options.

Credit:

(a) With cost of such capital stock of SBC's, convertible, and with stock purchase warrants or options, which has been divested of stock purchase rights through (1) the expiration of the conversion privilege, (2) the exercise or the expiration of rights conveyed by nondetachable or detachable stock purchase warrants or options, or (3) the detachment of detachable stock purchase warrants or options.

(b) With cost of such capital stock of SBC's, convertible, and with stock purchase warrants or options, converted to another class of capital stock.

(c) With cost of such capital stock of SBC's, convertible, and with stock purchase warrants or options, written off or disposed of otherwise.

NOTE 1: A participation is defined as an undivided interest shared with one or more other lenders or investors in a note, debenture, certificate of stock, or other instrument evidencing a loan to, or equity financing of, a small business concern.

NOTE 2: It is assumed that in all arrangements for participation in the acquisition of capital stock of SBC's, convertible, and with stock purchase warrants or options, the "initiating" company will service the financing.

NOTE 3: It is recommended that individual ledger cards or sheets be maintained for all capital stock of SBC's, convertible, and with stock purchase warrants or options.

(See accounts Nos. 192, 193, and memorandum record No. NA–10)

192 Capital stock of SBC's—other.

This account will represent the value at cost of small business concerns' capital stock acquired by the company without conversion privileges or stock purchase warrants or options, or existing on the books as the result of (1) the expiration of the conversion privilege of convertible capital stock of SBC's, (2) the exercise or the expiration of rights conveyed by nondetachable or detachable stock purchase warrants or options, or (3) the detachment of detachable stock purchase warrants or options, obtained in connection with the acquisition of capital stock of small business concerns pursuant to section 304 of the Small Business Investment Act of 1958, as amended.

Debit:

(a) With cost of such capital stock of SBC's—other acquired through (1) purchase, (2) conversion of convertible debt securities or convertible capital stock of SBC's, or (3) exercise of rights conveyed by stock purchase warrants or options issued by small business concerns in connection with their debt securities or capital stock acquired by the company.

(b) With cost of such capital stock of SBC's—other resulting from (1) the expiration of the conversion privilege of convertible capital stock of SBC's, (2) the expiration of rights conveyed by nondetachable or detachable stock purchase warrants or options, or (3) the detachment of detachable stock purchase warrants or options, obtained in connection with the acquisition of capital stock of small business concerns.

(c) With portion retained by company of the capital stock of SBC's—other in which participations are sold to others.

(d) With amount of participations in capital stock of SBC's—other acquired by or subsequently existing on the books of others without conversion privileges or stock purchase warrants or options.

Credit: (a) With cost of such capital stock of SBC's—other written off or disposed of otherwise.

NOTE 1: It is recommended that individual ledger cards or sheets be maintained for all capital stock of SBC's—other acquired or subsequently existing without conversion privileges or stock purchase warrants or options.

NOTE 2: In acquisitions of capital stock through exercise of rights conveyed by stock purchase warrants or options issued by small business concerns in connection with their debt securities or capital stock previously acquired by the company, the amount of the expenditure made by the company in the current acquisition of the capital stock will be considered the cost of the stock in those instances when the stock purchase rights surrendered have only a nominal value; otherwise, the cost of the stock will comprise the current expenditure plus the cost of the warrants or options surrendered.

NOTE 3: In conversions of convertible debt securities of small business concerns into capital stock, or in conversions of convertible capital stock of SBC's into another class of capital stock, the value at cost of the particular convertible security should be considered the cost of the capital stock received in the conversion.

(See accounts Nos. 190, 193, and 196)

193 Allowance for losses on capital stock of SBC's.

This account will represent the valuation reserve provided for estimated losses on capital stock of SBC's, convertible, and with stock purchase warrants or options, and capital stock of SBC's—other, and should be maintained in an amount not less than a conservative estimate of probable losses. This valuation reserve will be adjusted as occasion demands, so that this account will reflect the best available estimate of probable losses on capital stock of SBC's.

Debit:

(a) With amount of decreases in such reserve.

(b) With amount of reserve established in this account for capital stock which is written off, sold, or disposed of otherwise (contra credit for any portion representing an excess over losses actually incurred will be made to account No. 682).

(c) With amount of write-down of such capital stock, not to exceed the amount of reserve established therefor in this account.

Credit:

(a) With amount of such reserve established.

(b) With amount of increases in such reserve.

NOTE: When capital stock of SBC's is sold by the company or disposed of otherwise, cash or other appropriate asset account will be debited for the amount received, this account will be debited for the amount of the reserve established therein for such capital stock, and the appropriate investment account will be credited for the related cost value carried therein. If there is no loss, or it is less than the amount reserved for loss on capital stock disposed of, the excess portion of the amount reserved will be credited to account No. 682. If a gain over cost is realized, such gain will be credited to account No. 576. If a loss in relation to cost is sustained which is in excess of the amount reserved therefor, that portion above the amount of the reserve provided will be debited to account No. 706.

(See accounts Nos. 190 and 192)

196 Warrants, options, and other stock rights acquired from SBC's.

This account will represent the value at purchase price or at cost as otherwise determined of warrants, options, and other stock rights acquired by the company from small business concerns pursuant to section 304 of the Small Business Investment Act of 1958, as amended. The account will include conversion rights for which a separate cost has been determined.

Detachable stock purchase warrants or options on stock of SBC's for which no consideration is given distinct from that surrendered for the debt securities or capital stock which they accompany, or for which no separate cost has been determined, will be reflected in memorandum record No. NA–10, if retained after the financing instruments which they accompanied have been disposed of. (Reference should be made to Treasury regulations concerning the treatment of options acquired by lenders or investors in connection with investments.)

Debit:

(a) With cost of such warrants, options, or other stock rights acquired.

(b) With portion retained by company of the warrants, options, or other stock rights in which participations are sold to others.

(c) With amount of participations in acquisitions by others of warrants, options, or other stock rights.

Credit:

(a) With cost of such warrants, options, or other stock rights surrendered in exercising the stock rights.

(b) With cost of such warrants, options, or other stock rights written off or disposed of otherwise.

(c) With cost of such warrants, options, or other stock rights for which the exercise period has expired.

NOTE 1: It is recommended that individual ledger cards or sheets be maintained for all

warrants, options, or other stock rights acquired from SBC's.

NOTE 2: The cost of warrants, options, and other stock rights acquired from SBC's for a separate consideration will be charged to this account, with a credit to cash. If warrants, options, or other stock rights are acquired from SBC's without a separate consideration and a cost thereof is otherwise determined, such cost will be established in this account. (The determined cost of warrants, options, and other stock rights acquired with debt securities without a separate consideration therefor shall be arrived at giving full consideration to the grade of the debt security.) The payment for the debt security or capital stock certificate which accompanied the stock rights will be allocated between the obligation or stock and the stock rights. Cash will be credited for the determined cost of the stock rights. Cash also will be credited for the amount of the debt security or stock received less the amount withheld from disbursement in relation to the debt security or stock received, which is equivalent to the determined cost of the stock rights plus (in the case of a debt security) any other withholding from net funds advanced. In the purchase of a debt security the deduction equal to the determined cost of the stock rights, plus any other withholding from net funds advanced, will be treated as unearned discount on the debt security and credited to account No. 187—Unearned discount, fees, and other charges on debt securities (section 304). In the case of a purchase of capital stock, the deduction equal to the determined cost of the stock rights will serve to reduce the cost of the stock to be recorded in account No. 190—Capital stock of SBC's, convertible, and with stock purchase warrants or options.

(See accounts Nos. 197, 577, and 707)

197 Allowance for losses on warrants, options, and other stock rights acquired from SBC's.

This account will represent the valuation reserve provided for estimated losses on warrants, options, and other stock rights acquired from SBC's, and should be maintained in an amount not less than a conservative estimate of probable losses. This valuation reserve will be adjusted as occasion demands, so that this account will reflect the best available estimate of probable losses on warrants, options, and other stock rights acquired from SBC's.

Debit:

(a) With amount of decreases in such reserve.

(b) With amount of reserve established in this account for warrants, options, and other stock rights acquired from SBC's which are written off, sold, or disposed of otherwise (contra credit for any portion representing an excess over losses actually incurred will be made to account No. 682).

(c) With amount of write-down of such warrants, options, and other stock rights acquired from SBC's, not to exceed the amount of reserve established therefor in this account.

Credit:

(a) With amount of such reserve established.

(b) With amount of increases in such reserve.

NOTE: When warrants, options, and other stock rights acquired from SBC's are sold by the company or disposed of otherwise, cash or other appropriate asset account will be debited for the amount received, this account will be debited for the amount of the reserve established therein for such warrants, options, and other stock rights acquired from SBC's, and the appropriate investment account will be credited for the related cost value carried therein. If there is no loss, or if it is less than the amount reserved for loss on the stock rights disposed of, the excess portion of the amount reserved will be credited to account No. 682. If a gain over cost is realized, such gain will be credited to account No. 577. If a loss in relation to cost is sustained which is in excess of the amount reserved therefor, that portion above the amount of the reserve provided will be debited to account No. 707.

(See account No. 196)

200 Assets acquired in liquidation of loans and debt securities.

This account will represent the company's investment in assets acquired by foreclosure, or otherwise, in liquidation of loans (section 305) and debt securities (section 304). Judgments, sheriffs' certificates (including property acquired subject to redemption), etc., will be reflected in this account.

The investment in property at the date of acquisition by the company should be determined by the Board of Directors on the most suitable of the following bases, but not to exceed the total amount of the related loan or debt security involved: (1) Bid-in price of the property; (2) agreed consideration for the property; (3) fair appraised value of the property. Any remaining indebtedness will be written off unless the company expects further liquidation of the debt from other sources. Insofar as practicable, investment values will be determined for each individual asset, or unit, at the time such assets are recorded in this account, and when an asset is sold only an amount equal to the investment in such asset will be credited to this account.

The company's investment in real property acquired in liquidation of loans and debt securities should be recorded at gross value as determined by the Board of Directors. The amount of any existing mortgage on such property acquired by the company will be reflected in account No. 318.

The balance of the latter account will not be treated as a liability on the balance sheet but will be deducted from the asset account.

The company's investment in judgments should be recorded at the face amount of the judgment. When the company acquires the underlying security to the related loan or debt security outright or subject to redemption, the investment in the property should be determined in accordance with the bases set forth in the second paragraph.

Debit:

(a) With amount of the company's investment in the property at the time of acquisition.

(b) With amount of the company's investment in the property at the date of judgment, sheriff's certificate, etc.

(c) With amount of participation in assets acquired by others in liquidation of loans and debt securities.

Credit:

(a) With proceeds of partial sale of property.

(b) With amount of the company's investment at date of sale, or other disposition of property.

(c) With amount written off.

NOTE 1: Collateral notes receivable acquired in the liquidation of loans and debt securities will be reflected in this account; but notes receivable that are subsequently accepted in connection with the disposition of assets acquired in the liquidation of loans and debt securities will be included in account No. 140—Notes receivable.

NOTE 2: It is recommended that subsidiary records be maintained in sufficient detail to disclose for report and tax purposes all transactions affecting assets acquired in liquidation of loans and debt securities.

(See accounts Nos. 170, 180, 184, 201, and 203)

201 Allowance for losses on assets acquired in liquidation of loans and debt securities.

This account will represent the valuation reserve provided for estimated losses on assets acquired in liquidation of loans (section 305) and debt securities (section 304), and should be maintained in an amount not less than a conservative estimate of probable losses. This valuation reserve will be adjusted as occasion demands, so that this account will reflect the best available estimate of probable losses on assets acquired in liquidation of loans and debt securities.

Debit:

(a) With amount of decreases in such reserve.

(b) With amount of reserve established in this account for assets acquired in liquidation of loans and debt securities which are written off, sold, or disposed of otherwise (contra credit for any portion representing an excess over losses actually incurred will be made to account No. 682).

(c) With amount of write-down of such assets acquired in liquidation of loans and debt securities, not to exceed the amount of reserve established therefor in this account.

Credit:

(a) With amount of such reserve established.

(b) With amount of increases in such reserve.

NOTE: When assets acquired in liquidation of loans and debt securities are sold by the company or disposed of otherwise, cash or other appropriate asset account will be debited for the amount received, this account will be debited for the amount of the reserve established therein for such assets acquired in liquidation of loans and debt securities, and account No. 200 will be credited for the related cost value carried therein. If there is no loss, or it is less than the amount reserved for loss on the acquired assets disposed of, the excess portion of the amount reserved will be credited to account No. 682. If a gain over recorded investment in the assets acquired in liquidation is realized, such gain will be credited to account No. 578. If a loss in relation to recorded investment value is sustained which is in excess of the amount reserved therefor, that portion

above the amount of the reserve provided will be debited to account No. 708.

(See account No. 200)

203 Accumulated depreciation on assets acquired in liquidation of loans and debt securities.

This account will represent the valuation reserve provided for depreciation of depreciable property acquired by foreclosure, or otherwise, in liquidation of loans (section 305) and debt securities (section 304). This account should be maintained in an amount not less than a conservative estimate of the expired service life of such property while owned by the company.

Debit: (a) With amount of depreciation accumulated, when such an asset is sold or disposed of otherwise.

Credit: (a) At the end of each month, with the monthly amount necessary to depreciate the cost of such assets over the estimated service life.

(See accounts Nos. 200 and 710)

220 Prepaid expenses and deferred charges.

This account will represent the unexpired or unconsumed portion of expenses expressly applicable to future periods for which no specific accounts have been provided. Such expenses should be amortized over the appropriate period.

Debit: (a) With amount of prepaid or deferred expenses.

Credit: (a) At the end of each month, with the proportional amount of such expenses applicable to the current month.

NOTE: Subsidiary records should be maintained to identify the items reflected in this account and to facilitate their monthly amortization.

230 Furniture and equipment.

This account will represent the cost of furniture, fixtures and equipment, including automobiles, owned by the company. The cost of freight, drayage, cartage, express, etc., in connection with the purchase of such items of furniture and equipment, will be included in this account.

Debit: (a) With cost of such assets purchased.

Credit: (a) With cost of such assets at the time of sale or other disposition.

NOTE: An inventory record should be maintained for all such assets and each item should be tagged or numbered to facilitate ready identification.

(See account No. 231)

231 Accumulated depreciation on furniture and equipment.

This account will represent the valuation reserve provided for depreciation of furniture, fixtures, and equipment, including automobiles, owned by the company. This account should be maintained in an amount not less than a conservative estimate of the expired service life of such assets while owned by the company.

Debit: (a) With amount of depreciation accumulated, when such an asset is sold or disposed of otherwise.

Credit: (a) At the end of each month, with the monthly amount necessary to depreciate the cost of such assets over the estimated service life.

(See accounts Nos. 230 and 655)

240 Corporate premises owned.

This account will represent the actual cost of acquisition of the land and building used as the company's office quarters. The account also will include the actual cost of any improvements, such as street, sidewalk and other benefits, applicable to the land, and any improvements applicable to the building.

Debit:

(a) With actual cost of acquisition of the land and building.

(b) With actual cost of any improvement to the land and/or building.

Credit: (a) With the acquisition cost of the land and/or building, plus the cost of improvements made thereto, when the land and/or building is sold or disposed of otherwise.

(See account No. 241)

241 Accumulated depreciation on corporate premises owned.

This account will represent the valuation reserve provided for depreciation of the building and other depreciable improvements of corporate premises owned and used as the company's office quarters. This account should be maintained in an amount not less than a conservative estimate of the expired service life of such building and improvements while owned by the company.

Debit: (a) With amount of depreciation accumulated, when such an asset is sold or disposed of otherwise.

Credit: (a) At the end of each month, with the monthly amount necessary to depreciate the cost of such assets over the estimated service life.

(See accounts Nos. 240 and 655)

242 Leasehold improvements.

This account will represent the actual cost of improvements to leased property used as the company's office quarters. The amount of this account will be amortized through account No. 654—Cost of space occupied, over the life of the lease or the life of the improvements, whichever is the shorter.

Debit: (a) With actual cost of improvements to leasehold.

Credit: (a) At the end of each month, with the monthly amount necessary to amortize the cost of leasehold improvements.

255 Amounts due from directors, officers, and employees.

This account will represent the unpaid balance of amounts advanced to directors, officers, and employees.

Debit: (a) With amount of such advances made.

Credit:

(a) With amount collected on such advances.

(b) With amount transferred to appropriate expense classification upon proper authorization.

(c) With amount written off or disposed of otherwise.

(See account No. 709)

256 Organization costs.

This account will represent the amount of legal fees, promotional expense, stock certificate costs, incorporation fees, taxes, and other related costs incurred in organizing the company.

Debit: (a) With amount of such costs incurred.

Credit: (a) At the end of each month, with the monthly amount necessary to amortize the organization costs in accordance with Treasury regulations.

(See account No. 672)

257 Other assets.

This account will represent the amount of assets of the company not specifically provided for in other accounts, including recoverable amounts advanced for the protection and preservation of the company's investments (such as the payment of taxes on mortgaged property), but not including short-term loans or debt securities issued to protect the company's interests in previously issued long-term loans or equity securities.

Debit: (a) With amount of the company's investment in such assets.

Credit: (a) With amount of such assets sold or disposed of otherwise.

(See account No. 709)

LIABILITY ACCOUNTS

300 Notes payable to SBA.

This account will represent the unpaid principal balance of notes payable (1) for funds borrowed and received directly from the Small Business Administration and (2) for funds borrowed from others through guaranteed loans which subsequently have been purchased by the Small Business Administration.

Debit: (a) With amount of principal payments made on such notes.

Credit:

(a) With amount of funds borrowed.

(b) With unpaid principal balance of guaranteed loans purchased by SBA (contra debit will be made to account No. 315).

302 Debentures payable, subordinated, issued to SBA.

This account will represent the unpaid principal balance of funds received by the company under its subordinated debentures payable issued to the Small Business Administration for funds borrowed pursuant to section 302(a) of the Small Business Investment Act of 1958, as amended.

Debit: (a) With amount of principal payments made on such debentures.

Credit: (a) With amount of funds received under such debentures.

NOTE: The subordinated debentures purchased by the Small Business Administration under section 302(a) of the Small Business Investment Act of 1958, as amended, shall be deemed a part of the capital and surplus of the company for purposes of sections 302 (a), 303(b), and 306 of the Act.

310 Loans sold with recourse.

This account will represent the unpaid principal balance of loans outstanding to small business concerns which have been sold to individuals, banks, insurance companies, or other financial institutions with recourse upon the company in the event of default.

Debit:

(a) With amount collected on principal of such loans as reported to the company by the purchaser (contra credit will be made to account No. 170).

(b) With unpaid principal balance of such loans repurchased.

Credit: (a) With unpaid principal balance of such loans sold.

NOTE: This account is contra to account No. 170—Loans (section 305). For balance sheet purposes account No. 310 will be deducted from account No. 170.

312 Debt securities, convertible, and with stock purchase warrants or options sold with recourse.

This account will represent the unpaid principal balance of unmatured debt securities, convertible, and with stock purchase warrants or options, issued by small business concerns to the company, which are sold to individuals, banks, insurance companies, or other financial institutions with recourse upon the company in the event of default.

Debit:

(a) With unpaid principal balance of such debt securities, convertible, and with stock purchase warrants or options paid on maturity as reported to the company by the purchaser (contra credit will be made to account No. 180).

(b) With unpaid principal balance of such debt securities, convertible, and with stock purchase warrants or options repurchased.

Credit: (a) With unpaid principal balance of debt securities, convertible, and with stock purchase warrants or options sold with recourse.

NOTE: This account is contra to account No. 180—Debt securities, convertible, and with stock purchase warrants or options (section 304). For balance sheet purposes account No. 312 will be deducted from account No. 180.

314 Debt securities divested of stock rights sold with recourse.

This account will represent the unpaid principal balance of small business concerns' unmatured debt securities divested of stock rights which are sold to individuals, banks, insurance companies, or other financial institutions with recourse upon the company in the event of default.

Debit:

(a) With unpaid principal balance of such debt securities divested of stock rights paid on maturity as reported to the company by the purchaser (contra credit will be made to account No. 184).

(b) With unpaid principal balance of such debt securities divested of stock rights repurchased.

Credit: (a) With unpaid principal balance of such debt securities divested of stock rights sold with recourse.

NOTE: This account is contra to account No. 184—Debt securities divested of stock rights (section 304). For balance sheet purposes account No. 314 will be deducted from account No. 184.

315 Notes payable to other than SBA—guaranteed by SBA.

This account will represent the unpaid principal balance of notes payable for funds borrowed from other than the Small Business Administration and guaranteed by the Small Business Administration.

Debit:

(a) With amount of principal payments made on such notes.

(b) With unpaid principal balance of guaranteed loans purchased by SBA (contra credit will be made to account No. 300).

Credit: (a) With amount of funds borrowed.

316 Notes payable to other than SBA—not guaranteed by SBA.

This account will represent the unpaid principal balance of notes payable for funds borrowed from other than the Small Business Administration and not guaranteed by the Small Business Administration.

Debit: (a) With amount of principal payments made on such notes.

Credit: (a) With amount of funds borrowed.

317 Mortgages payable for funds borrowed.

This account will represent the unpaid principal balance of mortgages payable for funds borrowed on corporate premises or other real estate owned by the company. Purchase money mortgages, conditional sales contracts, or similar documentary evidence of indebtedness given by the company in the acquisition of real property will be included in this account.

Debit: (a) With amount of principal payments made on such indebtedness.

Credit: (a) With amount of funds borrowed.

318 Mortgages payable on assets acquired in liquidation of loans and debt securities.

This account will represent the unpaid principal balance of existing mortgages payable on assets acquired by the company in liquidation of loans and debt securities. The balance of this account will not be treated as a liability on the balance sheet but as an offset to the asset account.

Debit: (a) With amount of principal payments made on such indebtedness.

Credit: (a) With amount of such indebtedness.

(See account No. 200)

320 Notes payable—other.

This account will represent the unpaid principal balance of notes payable in evidence of amounts owed by the company other than for funds borrowed. Notes payable, conditional sales contracts, and liens for the acquisition of furniture, fixtures, equipment, and automobiles will be included in this account.

Debit: (a) With amount of principal payments made on such notes.

Credit: (a) With amount of unpaid principal of such notes executed.

340 Accounts payable.

This account will represent amounts payable on open account, including amounts representing "participating" companies' portions of accrued principal and interest receivable from financed small business concerns. The account also will include accrued compensation payable for services rendered to the company on its participations in financing transactions, and accrued commitment fees payable for having funds made available on a deferred basis by "participating" companies in connection with the financing of, or commitments to finance, small business.

Debit: (a) With amount of such indebtedness paid, or disposed of otherwise.

Credit: (a) With amount of such indebtedness incurred.

NOTE 1: A participation is defined as an undivided interest shared with one or more other lenders or investors in a note, debenture, certificate of stock, or other instrument evidencing a loan to, or equity financing of, a small business concern.

NOTE 2: A deferred participation is defined as a commitment under a participation agreement whereby the "participating" company will make funds available on a deferred basis to the "initiating" company in connection with the latter's financing of, or commitment to finance, a small business concern, or in connection with an "initiating" small business investment company's acquisition of loans or equity securities from other such companies.

(See accounts Nos. 150, 600, and 715)

350 Accrued interest payable.

This account will represent the amount of liability for interest accrued on the company's notes, mortgages and debentures payable, and on loans (section 305) and debt securities (section 304) of small business concerns sold with recourse upon the company in the event of default. The account also will include accrued interest payable on other interest-bearing obligations of the company.

Debit: (a) With amount of such interest paid or disposed of otherwise.

Credit:

(a) At the end of each month, with amount of interest accrued on all interest-bearing obligations covered by this account on that date.

(b) With amount of interest accrued during the month on such obligations paid in full or disposed of otherwise during the month.

351 Accrued taxes on payroll.

This account will represent the balance of accrued taxes on payroll, such as the company's portion of social security taxes, which have not been remitted to the appropriate collectors of such taxes.

Debit: (a) With amount of such taxes paid.

Credit: (a) With amount of such taxes accrued during the month.

(See account No. 664)

354 Estimated income taxes accrued.

This account will include the balances in subaccounts Nos. 354.1, 354.2, 354.3, etc.

354.1 Estimated Federal income taxes accrued.

This account will represent the balance of estimated Federal income taxes accrued which have not been remitted to the Internal Revenue Service.

Debit: (a) With amount of such taxes paid.

Credit: (a) With amount of such taxes accrued during the month.

(See subaccounts Nos. 720.1 and 722.1)

354.2 Estimated State income taxes accrued.

This account will represent the balance of estimated State income taxes accrued which have not been remitted to the appropriate collector of such taxes.

Debit: (a) With amount of such taxes paid.

Credit: (a) With amount of such taxes accrued during the month.

(See subaccounts Nos. 720.2 and 722.2)

358 Other accrued expenses.

This account will represent the amount of the company's liability as of the end of the month for accrued expenses, such as salaries, not provided for in other accounts.

Debit: (a) With amount of such expenses paid or disposed of otherwise.

Credit: (a) With amount of such expenses accrued during the month.

NOTE: Increases or decreases in the liability for accrued expenses, through accruals or adjustments, will be offset by increases or decreases, respectively, in the appropriate expense accounts.

360–364 Dividends payable on _____ (Type and class) capital stock.

These accounts will represent the company's liability for dividends declared by the company's Board of Directors on the respective types and classes of capital stock issued and outstanding. A separate account should be used to reflect the dividends payable for each type and class of capital stock outstanding.

Debit: (a) With amount of such dividends paid.

Credit: (a) With amount of such dividends declared payable by the company's Board of Directors.

370 Employee taxes withheld.

This account will represent the amount of income and social security taxes withheld from employees' salaries which have not been remitted to the appropriate collectors of such taxes.

Debit: (a) With amount of such taxes remitted.

Credit: (a) With amount of such taxes withheld.

374 Unapplied receipts.

This account will represent the amount of funds received by the company which have not been applied to loans (section 305), debt securities (section 304), interest receivable, etc. This account will be used only in instances when the funds received cannot be applied promptly.

Debit: (a) With amount of such funds applied or disposed of otherwise.

Credit: (a) With amount of funds received which cannot be applied promptly.

378 Miscellaneous trust receipts.

This account will represent the liability of the company for funds withheld or received in trust, for which no specific account is provided, including earnest money deposits, and funds withheld from employees' salaries for the purchase of U.S. Savings Bonds, payment of group life insurance premiums, payment of pension fund contributions, etc.

Debit: (a) With amount of such funds disbursed or disposed of otherwise.

Credit: (a) With amount of such funds withheld or received.

381 Other liabilities.

This account will represent the amount of liabilities of the company not specifically provided for in other accounts.

Debit: (a) With amount of such liabilities paid or disposed of otherwise.

Credit: (a) With amount of such liabilities incurred.

383 Other deferred credits.

This account will represent the amount of deferred credits of the company not specifically provided for in other accounts.

Debit: (a) With amount of such deferred credits transferred to income or gain, or disposed of otherwise.

Credit: (a) With amount of such deferred credits established.

NOTE 1: Accrual of interest receivable should be discontinued with respect to any loan or debt security financing a small business concern which is in bankruptcy, or on the verge thereof, or otherwise considered to be insolvent. Any interest payments received from such a debtor should not be treated as interest income, but should be either credited as payments on principal of the debt or credited as deferred income in this account, pending determination of the appropriate accounting. In less serious situations, when interest receivable is accrued under circumstances in which the financed small business concern has not earned the amount thereof, or the fair value of the loan or debt security as determined in good faith by the Board of Directors is less than cost, or recovery thereon is doubtful, an addition to the allowance for uncollectible interest receivable should be made in an amount equivalent to the accrual of interest receivable, or, as an alternative, the interest income should be deferred in this account as above indicated.

NOTE 2: This account may be used, at the option of the company, to defer gain arising from sales of assets on an installment-payment basis. Deferred gain in this account will be transferred to appropriate gain accounts as it is realized.

CAPITAL STOCK AND SURPLUS ACCOUNTS

400–404 _____ (Type and class) capital stock authorized.

These accounts will represent the total par or stated value of the capital stock authorized, as provided for in the company's charter. A separate account should be provided for each type and class of capital stock authorized.

Debit: (a) With amount of reductions of such capital stock authorized.

Credit:

(a) With original amount of such capital stock authorized.

(b) With additional amounts of such capital stock authorized.

(See accounts Nos. 405–409 and "Note" of accounts Nos. 415–419)

405–409 _____ (Type and class) unissued capital stock.

These accounts will represent the total par or stated value of unissued capital stock of the company. A separate account should be provided for each type and class of unissued capital stock.

Debit:

(a) With original amount of such unissued capital stock, as provided for in the company's charter.

(b) With additional amounts of such unissued capital stock authorized.

(c) With par or stated value of capital stock retired.

Credit:

(a) With amount of such capital stock issued (contra debit will be made to accounts Nos. 410–412).

(b) With amount of reductions of capital stock authorized.

(See accounts Nos. 400–404 and "Note" of accounts Nos. 415–419)

410–411 _____ (Type and class) capital stock subscribed.

These accounts will represent the total amount at the subscription price of the company's capital stock subscribed. A separate account should be provided for each type and class of capital stock subscribed. These accounts will reflect the company's responsibility to issue shares of its stock to subscribers who have made final payment of their capital stock subscriptions.

Debit:

(a) With amount at the subscription price of such subscribed capital stock issued (contra credits will be made to accounts Nos. 405–409 and, as appropriate, No. 420).

(b) With amount at the subscription price of such subscribed capital stock canceled or disposed of otherwise.

Credit: (a) With amount at the subscription price of such capital stock subscribed.

(See accounts Nos. 413–414 and "Note" of accounts Nos. 415–419)

413–414 Capital stock subscriptions receivable— _____ (Type and class)

These accounts will represent the total unpaid balances of capital stock subscriptions receivable from subscribers of the company's authorized capital stock. A separate subscriptions receivable account should be provided for each type and class of capital stock subscribed.

Debit: (a) With amount of such capital stock subscriptions received.

Credit:

(a) With amount collected on such capital stock subscriptions.

(b) With amount of such capital stock subscriptions canceled or disposed of otherwise.

(See accounts Nos. 410–411 and "Note" of accounts Nos. 415–419)

415–419 Treasury stock _____.
(Type and class)

These accounts will represent the total amount of the company's issued capital stock which has been reacquired through purchase or donation and has not been retired. A separate account should be provided for each type and class of such capital stock held by the company.

Debit:

(a) With cost of such capital stock acquired through purchase.

(b) With amount of fair market value or par value of such capital stock acquired through donation (contra credit will be made to account No. 420).

Credit:

(a) With cost of such capital stock acquired through purchase, when sold or disposed of otherwise.

(b) With amount of fair market value or par value of such capital stock acquired through donation, when sold or disposed of otherwise.

NOTE: Appropriate subsidiary records should be maintained as deemed necessary.

420 Paid-in surplus.

This account will represent the amount of surplus arising from (1) sales initially of the company's capital stock at a price in excess of par value (including amounts transferred from capital stock subscribed at a price above par, when shares are issued); (2) donations to the company of its issued capital stock carried as treasury stock at fair market value or par value; (3) retirements of capital stock purchased at less than the par value thereof; (4) sales of treasury stock in excess of its carrying value on the books of the company; (5) donations or gifts to the company of assets carried at not in excess of fair market value; and (6) other capital equity transactions with stockholders.

Debit:

(a) With amount of loss on treasury stock sold which was acquired through purchase, but not to exceed the total of credits residing in this account relating to previous gains on treasury stock sold or retirement of capital stock at amounts less than the amounts previously paid in with respect thereto (any amount of loss in excess of the total of such credits will be charged to retained earnings, account No. 425).

(b) With amount received by the company below fair market value, or par value, whichever applicable, for treasury stock sold which was acquired through donation.

(c) With amount paid by the company in excess of par value, but not to exceed the premium received initially, for shares of capital stock retired (any amount paid in excess of par plus initial premium received will be charged to retained earnings, account No. 425).

Credit:

(a) With amount paid in (including stock dividends from retained earnings), or transferred from capital stock subscribed, representing the excess (after deduction of underwriters' fees and commissions) over par value of the company's capital stock, when shares are issued.

(b) With amount of fair market value or par value of the company's capital stock acquired through donation.

(c) With amount of discount below par value of the company's capital stock acquired through purchase, when such stock is retired.

(d) With amount received by the company in excess of cost, or in excess of fair market value or par value, whichever applicable, for treasury stock sold.

(e) With amount not to exceed fair market value of donations or gifts of assets to the company.

425 Retained earnings.

This account will represent the accumulated balance of the company's undistributed net income since incorporation.

Debit:

(a) At the end of the fiscal year, with any debit balance reflected in the profit and loss summary account, No. 429, and/or the realized gain and loss summary account, No. 430.

(b) With amount of dividends, other than stock dividends, declared payable out of retained earnings by the company's Board of Directors.

(c) With amount of stock dividends, at a per share value representing the higher of fair value or the average paid-in capital per share existing at the time that the dividend is declared (par or stated value of capital stock issued plus paid-in surplus divided by the number of shares of capital stock issued), which are declared by the company's Board of Directors and paid out of retained earnings.

(d) With appropriate amount of loss on treasury stock sold which was acquired through purchase, representing the excess of such loss over the total of credits residing in paid-in surplus, account No. 420, relating to previous gains on treasury stock sold or retirement of capital stock at amounts less than the amounts previously paid in with respect thereto.

(e) With appropriate amount paid by the company in excess of par plus initial premium received on the type and class of shares of capital stock retired.

(f) With amounts transferred to appropriated retained earnings upon approval by the Board of Directors.

Credit:

(a) At the end of the fiscal year, with the credit balances of the profit and loss summary account, No. 429, and the realized gain and loss summary account, No. 430.

(b) With amounts returned from appropriated retained earnings.

(See account No. 427)

427 Appropriated retained earnings.

This account will represent the amount of retained earnings restricted from dividend distribution and thus earmarked for some future purpose.

Debit: (a) With amounts returned to the retained earnings account after purpose has been served.

Credit: (a) With amounts transferred from retained earnings upon approval by the Board of Directors.

(See account No. 425)

429 Profit and loss summary.

This account will be used as a clearing account through which all income and expense accounts on the books of the company will be closed.

Debit:

(a) At the end of the fiscal year, with the debit balances of all expense and income accounts.

(b) At the end of the fiscal year, with the credit balance of the account (transfer to retained earnings).

Credit:

(a) At the end of the fiscal year, with the credit balances of all income and expense accounts.

(b) At the end of the fiscal year, with the debit balance of the account (transfer to retained earnings).

(See account No. 425)

430 Realized gain and loss summary.

This account will be used as a clearing account through which all accounts for realized gains and losses on investments on the books of the company will be closed.

Debit:

(a) At the end of the fiscal year, with the balances of all accounts for losses on investments.

(b) At the end of the fiscal year, with the credit balance of the account (transfer to retained earnings).

Credit:

(a) At the end of the fiscal year, with the balances of all accounts for gains on investments.

(b) At the end of the fiscal year, with the debit balance of the account (transfer to retained earnings).

(See account No. 425)

INCOME ACCOUNTS

500 Commitment income.

This account will represent the amount of income earned during the month on commitments to small business concerns for loans (section 305) and equity securities (section 304). This account, on the books of the "participating" company, will include the amount of commitment income during the month on deferred participations.

Debit: (a) At the end of the fiscal year, with the balance of account (transfer to profit and loss summary).

Credit: (a) With amount of income earned during the month on commitments and deferred participations.

NOTE 1: A deferred participation is defined as a commitment under a participation agreement whereby the "participating" company will make funds available on a deferred

basis to the "initiating" company in connection with the latter's financing of, or commitment to finance, a small business concern, or in connection with an "initiating" small business investment company's acquisition of loans or equity securities from other such companies.

NOTE 2: Recording as income in this account of accrued commitment fees receivable should be discontinued with respect to any small business concern which is in bankruptcy, or on the verge thereof, or otherwise considered to be insolvent. The amounts in question should be credited as deferred income in account No. 383—Other deferred credits, pending determination of the appropriate accounting. In less serious situations, when the small business concern has not earned the amount of accrued commitment fees, or the fair value of its debt or equity instruments held by the company, as determined by the Board of Directors, is less than cost, or recovery thereon is doubtful, an addition to the allowance for uncollectible notes and accounts receivable should be made in an amount equivalent to the accrued commitment fees taken into income in this account, or, as an alternative, the commitment income should be deferred in account No. 383 as above indicated.

(See account No. 151)

504 Interest on invested idle funds.

This account will represent the amount of interest earned during the month on (1) time deposits in banks which are members of the Federal Deposit Insurance Corporation, (2) U.S. Government obligations, direct and fully guaranteed, owned by the company, and (3) funds of the company in insured savings accounts in institutions the accounts of which are insured by the Federal Savings and Loan Insurance Corporation.

Debit: (a) At the end of the fiscal year, with the balance of account (transfer to profit and loss summary).

Credit:

(a) At the end of each month, with amount of interest earned during the month on invested idle funds existing on that date.

(b) With amount of interest earned during the month on invested idle funds withdrawn during the month.

512 Interest on loans.

This account will represent the amount of interest earned during the month on loans (section 305) to small business concerns.

Debit: (a) At the end of the fiscal year, with the balance of account (transfer to profit and loss summary).

Credit:

(a) At the end of each month, with amount of interest earned during the month on loans outstanding to small business concerns on that date.

(b) With amount of interest earned during the month on loans to small business concerns paid in full during the month.

NOTE: Accrual of interest receivable should be discontinued with respect to any loan to a small business concern which is in bankruptcy, or on the verge thereof, or otherwise considered to be insolvent. Any interest payments received from such a debtor should not be credited to this account as interest income, but should be either credited as payments on principal of the debt or credited as deferred income in account No. 383—Other deferred credits, pending determination of the appropriate accounting. In less serious situations, when interest receivable is accrued under circumstances in which the financed small business concern has not earned the amount thereof, or the fair value of the loan as determined in good faith by the Board of Directors is less than cost, or recovery thereon is doubtful, an addition to the allowance for uncollectible interest receivable should be made in an amount equivalent to the accrued interest receivable taken into income in this account, or, as an alternative, the interest income should be deferred in account No. 383 as above indicated.

(See accounts Nos. 160, 161, 170, and 173)

516 Interest on debt securities.

This account will represent the amount of interest earned during the month on debt securities of small business concerns owned by the company pursuant to section 304 of the Small Business Investment Act of 1958, as amended.

Debit: (a) At the end of the fiscal year, with the balance of account (transfer to profit and loss summary).

Credit:

(a) At the end of each month, with amount of interest earned during the period on such debt securities owned on that date.

(b) With amount of interest earned during the month on such debt securities paid in full or converted to capital stock during the month.

NOTE: Accrual of interest receivable should be discontinued with respect to any debt security of a small business concern which is in bankruptcy, or on the verge thereof, or otherwise considered to be insolvent. Any interest payments received from such a debtor should not be credited to this account as interest income, but should be either credited as payments on principal of the debt or credited as deferred income in account No. 383—Other deferred credits, pending determination of the appropriate accounting. In less serious situations, when interest receivable is accrued under circumstances in which the financed small business concern has not earned the amount thereof, or the fair value of the debt security as determined in good faith by the Board of Directors is less than cost, or recovery thereon is doubtful, an addition to the allowance for uncollectible interest receivable should be made in an amount equivalent to the accrued interest receivable taken into income in this account, or, as an alternative, the interest income should be deferred in account No. 383 as above indicated.

(See accounts Nos. 160, 161, 180, 184, and 187)

520 Interest income—other.

This account will represent the amount of interest earned during the month on miscellaneous notes receivable, funds in escrow pending closing of financing, and interest-bearing receivables not otherwise classified.

Debit: (a) At the end of the fiscal year, with the balance of account (transfer to profit and loss summary).

Credit:

(a) At the end of each month, with amount of interest earned during the period on such receivables on that date.

(b) With amount of interest earned during the month on such receivables paid in full during the month.

(See accounts Nos. 140, 160, and 179)

532 Management consulting service fees.

This account will represent the amount of fees charged during the month for management consulting services rendered to small business concerns and other small business investment companies pursuant to section 308(b) of the Small Business Investment Act of 1958, as amended.

Debit: (a) At the end of the fiscal year, with the balance of account (transfer to profit and loss summary).

Credit: (a) With amount of such fees charged.

NOTE: Recording as income in this account of accrued management consulting service fees receivable should be discontinued with respect to any small business concern which is in bankruptcy, or on the verge thereof, or otherwise considered to be insolvent. The amounts in question should be credited as deferred income in account No. 383—Other deferred credits, pending determination of the appropriate accounting. In less serious situations, when the small business concern has not earned the amount of accrued management consulting service fees, or the fair value of its debt or equity instruments held by the company, as determined by the Board of Directors, is less than cost, or recovery thereon is doubtful, an addition to the allowance for uncollectible notes and accounts receivable should be made in an amount equivalent to the accrued management consulting service fees taken into income in this account, or, as an alternative, the management consulting service income should be deferred in account No. 383 as above indicated.

(See accounts Nos. 140, 150, and 151)

534 Investigation and service fees charged other lenders.

This account will represent the amount of fees charged during the month for investigation and services rendered to banks or other lenders or investors, pursuant to section 308(a) of the Small Business Investment Act of 1958, as amended. The account will include compensation for financial services rendered in connection with participations sold.

Debit: (a) At the end of the fiscal year, with the balance of account (transfer to profit and loss summary).

Credit: (a) With amount of such fees charged.

(See accounts Nos. 140 and 150)

536 Application and appraisal fees.

This account will represent the amount of fees charged during the month for application, appraisal, investigation, and related services rendered to small business concerns.

Debit: (a) At the end of the fiscal year, with the balance of account (transfer to profit and loss summary).

Credit: (a) With amount of such fees charged.

(See accounts Nos. 173 and 187 and "Note" of accounts Nos. 140, 150, and 532)

540 **Dividends on capital stock of SBC's.**

This account will represent the amount of income from dividends on capital stock of small business concerns.

Debit: (a) At the end of the fiscal year, with the balance of account (transfer to profit and loss summary).

Credit: (a) With amount of income from such dividends.

(See "Note" of accounts Nos. 140, 150, and 532)

541 **Sharings in income of SBC's.**

This account will represent the amount of sharings or participations in the income of small business concerns from which the company has acquired debt securities (section 304).

Debit: (a) At the end of the fiscal year, with the balance of account (transfer to profit and loss summary).

Credit: (a) With amount of such sharings.

(See "Note" of accounts Nos. 140, 150, and 532)

570 **Gain on U.S. Government securities.**

This account will represent the amount of gain on the sale or other disposition of U.S. Government obligations, direct and fully guaranteed, carried in account No. 130.

Debit: (a) At the end of the fiscal year, with the balance of account (transfer to realized gain and loss summary).

Credit: (a) With amount of gain on such securities sold or disposed of otherwise.

NOTE: Increase in value over cost of United States Treasury bills, which are issued at a discount and are noninterest bearing, will not be reflected in this account but will be credited at the end of each month to account No. 504—Interest on invested idle funds, with concurrent debit to account No. 160—Accrued interest receivable.

572 **Gain on debt securities (section 304).**

This account will represent the amount of gain on the sale or other disposition of debt securities (section 304) of small business concerns carried in accounts Nos. 180 and 184, and will include recoveries on debt security losses previously charged to the loss account.

Debit: (a) At the end of the fiscal year, with the balance of account (transfer to realized gain and loss summary).

Credit:

(a) With amount of gain on such debt securities sold or disposed of otherwise.

(b) With amount collected on portions of debt securities previously charged to the loss account.

(See accounts Nos. 383 and 702)

576 **Gain on capital stock of SBC's.**

This account will represent the amount of gain on the sale or other disposition of capital stock of small business concerns carried in accounts Nos. 190 and 192, and will include recoveries on capital stock losses previously charged to the loss account.

Debit: (a) At the end of the fiscal year, with the balance of account (transfer to realized gain and loss summary).

Credit:

(a) With amount of gain on such capital stock sold or disposed of otherwise.

(b) With amount realized on capital stock of SBC's previously charged to the loss account.

(See accounts Nos. 383 and 706)

577 **Gain on warrants, options, and other stock rights acquired from SBC's.**

This account will represent the amount of gain on the sale or other disposition of warrants, options, and other stock rights acquired from SBC's, and will include recoveries on stock rights losses previously charged to the loss account.

Debit: (a) At the end of the fiscal year, with the balance of account (transfer to realized gain and loss summary).

Credit:

(a) With amount of gain on such warrants, options, and other stock rights acquired from SBC's sold or disposed of otherwise.

(b) With amount realized on warrants, options, and other stock rights previously charged to the loss account.

(See accounts Nos. 196, 383, 707, and memorandum record No. NA-10)

578 **Gain on assets acquired in liquidation of loans and debt securities.**

This account will represent the amount of gain on the sale or other disposition of assets acquired in liquidation of loans (section 305) and debt securities (section 304) of small business concerns carried in account No. 200, and will include recoveries on losses on assets acquired in liquidation previously charged to the loss account.

Debit: (a) At the end of the fiscal year, with the balance of account (transfer to realized gain and loss summary).

Credit:

(a) With amount of gain on such assets acquired in liquidation of loans and debt securities sold or disposed of otherwise.

(b) With amount realized on assets acquired in liquidation of loans and debt securities previously charged to the loss account.

(See accounts Nos. 383 and 708)

579 **Gain on other assets.**

This account will represent the amount of gain on the sale or other disposition of assets not specifically provided for in other accounts, and will include recoveries on losses on other assets previously charged to the loss account.

Debit: (a) At the end of the fiscal year, with the balance of account (transfer to realized gain and loss summary).

Credit:

(a) With amount of gain on such assets sold or disposed of otherwise.

(b) With amount realized on other assets previously charged to the loss account.

(See accounts Nos. 383 and 709)

582 **Income from assets acquired in liquidation of loans and debt securities.**

This account will represent the amount of income earned during the month on assets acquired in liquidation of loans (section 305) and debt securities (section 304), including the operation of properties, carried in account No. 200.

Debit: (a) At the end of the fiscal year, with the balance of account (transfer to profit and loss summary).

Credit: (a) With amount of such income earned during the month.

NOTE: In instances when a liquidating agent is employed to supervise the disposition of the assets, appropriate subsidiary accounts should be maintained by the agent. Cash collected from the sale of assets by the liquidating agent should be remitted immediately to the company. The company should maintain a local depository bank account, in which all receipts of the agent are deposited when direct remittances to the company are not feasible. Deposit balances in this account should be subject to withdrawal by check only by the company and should be reflected on the company's records in the same manner as other bank accounts.

Any advances to a liquidating agent for expenses incident to the operation or the disposition of assets acquired in the liquidation of loans and debt securities should be charged to account No. 220—Prepaid expenses and deferred charges.

584 **Other income.**

This account will represent the income earned during the month not specifically provided for in other accounts.

Debit: (a) At the end of the fiscal year, with the balance of account (transfer to profit and loss summary).

Credit: (a) With amount of such income earned during the month.

EXPENSE ACCOUNTS

600 **Commitment expense.**

This account will represent the amount of commitment expense during the month on commitments from the Small Business Administration and on commitments from lending institutions other than the Small Business Administration.

On the books of the "initiating" company, this account also will include the amount of commitment expense during the month on deferred participations.

Debit: (a) With amount of expense incurred during the month on commitments and deferred participations.

Credit: (a) At the end of the fiscal year, with the balance of account (transfer to profit and loss summary).

NOTE: A deferred participation is defined as a commitment under a participation agreement whereby the "participating" company will make funds available on a deferred basis to the "initiating" company in connection with the latter's financing of, or commitment to finance, a small business concern, or in connection with an "initiating" small business investment company's acquisition of loans or equity securities from other such companies.

(See account No. 340)

610 **Interest on obligations payable to SBA.**

This account will represent the amount of interest expense accrued during the month on obligations payable to the Small Business Administration for funds borrowed.

Debit: (a) With amount of such interest accrued during the month.

Credit: (a) At the end of the fiscal year, with the balance of account (transfer to profit and loss summary).

(See accounts Nos. 300, 302, and 350)

622 Interest on obligations payable to other than SBA.

This account will represent the amount of interest expense accrued during the month on obligations payable to other than the Small Business Administration for funds borrowed.

Debit: (a) With amount of such interest accrued during the month.

Credit: (a) At the end of the fiscal year, with the balance of account (transfer to profit and loss summary).

(See accounts Nos. 310, 312, 314, 315, 316, 317, 320, and 350)

642 Stock record and other financial expenses.

This account will represent the amount of charges to the company by the transfer agent and the registrar for services rendered in connection with the issuance and transfer of the company's capital stock, and will include other financial expenses not provided for elsewhere.

Debit: (a) With amount of such expenses incurred during the month.

Credit: (a) At the end of the fiscal year, with the balance of account (transfer to profit and loss summary).

650–679 Operating expenses.

The accounts under this caption will represent the amounts of operating expenses incurred.

Debit appropriate account: (a) With amount of operating expenses incurred during the month.

Credit appropriate account: (a) At the end of the fiscal year, with the balance of account (transfer to profit and loss summary).

650 Advertising and promotional costs.

This account will represent the cost of advertising and promoting the company's services, including the cost of entertaining prospective borrowers and clients.

651 Appraisal and investigation costs.

This account will represent the amount of charges made by outside firms and individuals for appraisal, investigation, and related services rendered to the company.

652 Auditing and examination costs.

This account will represent the amount of charges for auditing, examination, and bookkeeping services rendered by accountants not on the company's payroll, and charges for services rendered by SBA examiners.

653 Communications.

This account will represent telephone, telegraph, and postage expense.

654 Cost of space occupied.

This account will represent the cost of space occupied such as rent, alterations, amortization of leasehold improvements, light, heat, power, janitor service, maintenance and repair expense on buildings, furniture, and equipment (other than automobiles), etc.

655 Depreciation of corporate premises owned, furniture, and equipment.

This account will represent the amount of provision applicable to the fiscal year for depreciation of the building and other depreciable improvements of corporate premises owned and used as the company's office quarters. The account also will include the amount of provision applicable to the fiscal year for depreciation of furniture and equipment (other than automobiles) owned by the company.

657 Directors' and stockholders' meetings costs.

This account will represent directors' fees and travel expense for attendance at directors' and stockholders' meetings. The account also will include the cost of holding stockholders' meetings, such as rental of the meeting hall and related expenses.

658 Insurance.

This account will represent fire, theft, employee group life insurance, and other insurance expense, including fidelity bond premiums and insurance on automobiles. The portion, if any, of employee group life insurance premiums withheld from salaries or received from employees will be reflected in account No. 378. Insurance premiums to be amortized will be charged to account No. 220.

660 Investment adviser costs.

This account will represent the amount of charges made by outside firms and individuals for furnishing consultation and advice to the company with respect to the desirability of investing in, purchasing, or selling loans, debt securities, and capital stock of small business concerns and other property.

661 Legal services.

This account will represent the cost of legal services rendered to the company.

663 Salaries.

This account will include the balances in subaccounts Nos. 663.1 and 663.2.

663.1 Salaries of officers.

This account will represent the salary cost of all officers of the company, including directors' salaries, if any, but not directors' fees for attendance at meetings.

663.2 Salaries of employees.

This account will represent the salary cost of all employees other than officers, including salaries of any temporary or part-time employees engaged for specific assignments.

664 Taxes, excluding income taxes.

This account will represent the cost of all taxes, including those on corporate premises owned, motor vehicle, and personal property, social security taxes (company's portion), and other taxes charged to the company, exclusive of income taxes.

665 Travel.

This account will represent all travel expense, including transportation charges, automobile maintenance, operating expense, and depreciation expense, meals, lodging, telephone, telegraph, and other company costs incurred by officers and employees while in a travel status.

670 Employee benefits expense.

This account will represent the cost assumed by the company in contributing to funds providing for employee retirement benefits and other types of employee benefits, except group life insurance. The portion, if any, of the cost of employee benefits withheld from salaries or received from employees will be reflected in account No. 378.

672 Organization expense.

This account will represent the amount of legal fees, promotional expense, stock certificate costs, incorporation fees, taxes, and other related costs incurred in organizing the company, which are charged to expense (this account) as incurred or are transferred to this account periodically through the amortization of organization costs established as an asset in account No. 256.

679 Miscellaneous operating expenses.

This account will represent the amount of operating expenses not specifically provided for in other accounts. There will be included expenses incurred under contracts for management of the company; amounts paid in connection with dues, subscriptions, donations, and similar items; charges made to the company for custodial or safekeeping services in connection with its portfolio securities; and bank service charges, exchange on checks, protest fees, etc., and the cost of office supplies such as stationery, accounting forms, binders, pencils, etc.

680 Estimated losses on receivables.

This account will represent the amount of estimated losses applicable to the fiscal year on notes and accounts receivable, and interest receivable.

Debit: (a) With amount of such estimated losses incurred during the month.

Credit: (a) At the end of the fiscal year, with the balance of account (transfer to profit and loss summary).

682 Estimated losses on loans, investments, and other assets.

This account will represent the amount of estimated losses applicable to the fiscal year on loans (section 305); debt securities (section 304); capital stock of small business concerns; warrants, options, and other stock rights acquired from SBCs; and assets acquired in liquidation of loans and debt securities.

Debit: (a) With amount of such estimated losses incurred during the month.

Credit: (a) At the end of the fiscal year, with the balance of account (transfer to profit and loss summary).

700 Loss on U.S. Government securities.

This account will represent the amount of loss on the sale or other disposition of United States Government obligations, direct and fully guaranteed, carried in account No. 130.

Debit: (a) With amount of loss on such securities sold or disposed of otherwise.

Credit: (a) At the end of the fiscal year, with the balance of account (transfer to realized gain and loss summary).

702 Loss on debt securities (section 304).

This account will represent the amount of loss in excess of that provided for in account No. 185 on the write-down or sale or other disposition of debt securities (section 304) of small business concerns carried in accounts Nos. 180 and 184.

Debit: (a) With amount of loss in excess of that provided for in account No. 185 on such debt securities written down or sold or disposed of otherwise.

Credit: (a) At the end of the fiscal year, with the balance of account (transfer to realized gain and loss summary).

(See account No. 572)

706 Loss on capital stock of SBC's.

This account will represent the amount of loss in excess of that provided for in account No. 193 on the write-down or sale or other disposition of capital stock of small business concerns carried in accounts Nos. 190 and 192.

Debit: (a) With amount of loss in excess of that provided for in account No. 193 on such capital stock written down or sold or disposed of otherwise.

Credit: (a) At the end of the fiscal year, with the balance of account (transfer to realized gain and loss summary).

(See account No. 576)

707 Loss on warrants, options, and other stock rights acquired from SBC's.

This account will represent the amount of loss in excess of that provided for in account No. 197 on the write-down or sale or other disposition of warrants, options, and other stock rights acquired from SBC's.

Debit: (a) With amount of loss in excess of that provided for in account No. 197 on such warrants, options, and other stock rights written down or sold or disposed of otherwise.

Credit: (a) At the end of the fiscal year, with the balance of account (transfer to realized gain and loss summary).

(See accounts Nos. 196, 577, and memorandum record No. NA–10)

708 Loss on assets acquired in liquidation of loans and debt securities.

This account will represent the amount of loss in excess of that provided for in account No. 201 on the write-down or sale or other disposition of assets acquired in liquidation of loans (section 305) and debt securities (section 304) of small business concerns carried in account No. 200.

Debit: (a) With amount of loss in excess of that provided for in account No. 201 on such assets written down or sold or disposed of otherwise.

Credit: (a) At the end of the fiscal year, with the balance of account (transfer to realized gain and loss summary).

(See account No. 578)

709 Loss on other assets.

This account will represent the amount of loss on the sale or other disposition of assets not specifically provided for in other accounts.

Debit: (a) With amount of loss on such assets sold or disposed of otherwise.

Credit: (a) At the end of the fiscal year, with the balance of account (transfer to realized gain and loss summary).

(See account No. 579)

710 Expense on assets acquired in liquidation of loans and debt securities.

This account will represent the amount of expense incurred during the month on assets acquired in liquidation of loans (section 305) and debt securities (section 304), including the operation and depreciation of properties, carried in account No. 200. The account also will include the amount of interest expense accrued during the month on mortgages payable on assets acquired in liquidation of loans and debt securities.

Debit: (a) With amount of such expense incurred during the month.

Credit: (a) At the end of the fiscal year, with the balance of account (transfer to profit and loss summary).

NOTE: In instances when a liquidating agent is employed to supervise the disposition of the assets, appropriate subsidiary accounts should be maintained by the agent. Cash collected from the sale of assets by the liquidating agent should be remitted immediately to the company. The company should maintain a local depository bank account, in which all receipts of the agent are deposited when direct remittances to the company are not feasible. Deposit balances in this account should be subject to withdrawal by check only by the company and should be reflected on the company's records in the same manner as other bank accounts. Any advances to a liquidating agent for expenses incident to the operation of or in the disposition of assets acquired in the liquidation of loans and debt securities should be charged to account No. 220—Prepaid expenses and deferred charges.

715 Other expenses.

This account will represent the amount of nonoperating expenses not specifically provided for in other accounts, including, on the books of the "participating" company, the amount of compensation expense during the month for financial services received from "initiating" companies in connection with participations purchased.

Debit: (a) With amount of such expenses incurred during the month.

Credit: (a) At the end of the fiscal year, with the balance of account (transfer to profit and loss summary).

(See account No. 340)

720 Income taxes—net income.

This account will include the balances in subaccounts Nos. 720.1, 720.2, 720.3, etc.

720.1 Federal income taxes—net income.

This account will represent the amount of Federal income taxes applicable to net income for the current fiscal year.

Debit: (a) With amount of such taxes accrued during the month.

Credit: (a) At the end of the fiscal year, with the balance of account (transfer to profit and loss summary).

(See subaccount No. 354.1)

720.2 State income taxes—net income.

This account will represent the amount of State income taxes applicable to net income for the current fiscal year.

Debit: (a) With amount of such taxes accrued during the month.

Credit: (a) At the end of the fiscal year, with the balance of account (transfer to profit and loss summary).

(See subaccount No. 354.2)

722 Income taxes—net realized gain on investments.

This account will include the balances in subaccounts Nos. 722.1, 722.2, 722.3, etc.

722.1 Federal income taxes—net realized gain on investments.

This account will represent the amount of Federal income taxes applicable to net realized gain on investments for the current fiscal year.

Debit: (a) With amount of such taxes accrued during the month.

Credit: (a) At the end of the fiscal year, with the balance of account (transfer to realized gain and loss summary).

(See subaccount No. 354.1)

722.2 State income taxes—net realized gain on investments.

This account will represent the amount of State income taxes applicable to net realized gain on investments for the current fiscal year.

Debit: (a) With amount of such taxes accrued during the month.

Credit: (a) At the end of the fiscal year, with the balance of account (transfer to realized gain and loss summary).

(See subaccount No. 354.2)

MEMORANDUM RECORDS

Nominal Assets

NA–10 Stock purchase warrants or options on stock of SBC's.

This record will show the company's ownership of detachable stock purchase warrants or options on stock of SBC's, retained after the accompanying financing instruments have been disposed of, for which no consideration was given distinct from that surrendered for such fi-

nancing instruments and for which no separate cost has otherwise been determined.

Each such detachable stock purchase warrant or option certificate should be entered in this record, upon detachment, at a nominal value of one dollar ($1.00). Upon sale of such a detached stock purchase warrant or option, upon exercise or expiration of rights conveyed by such a detached stock purchase warrant or option, or upon the determination of a cost to be recorded for such a detached stock purchase warrant or option, the entry establishing such certificate in the memorandum records is to be discharged through an equivalent credit.

Debit: (a) With nominal value of such detachable stock purchase warrants or options upon their detachment from capital stock certificates or debt securities.

Credit:

(a) With nominal value of such detached stock purchase warrants or options upon exercise or expiration of rights conveyed by such warrant or option certificates.

(b) With nominal value of such detached stock purchase warrants or options sold or disposed of otherwise.

(c) With nominal value of such detached stock purchase warrants or options for which a separate cost has been established.

(See accounts Nos. 180, 190, and 196)

NA–12 Undisbursed commitment from SBA.

This record will show the amount of the undisbursed commitment by the Small Business Administration to provide capital and surplus to the company, arising from SBA's purchase of subordinated debentures issued by the company. When funds are received against commitments, appropriate entry will be made in this record.

Contingent Liabilities

CL–16 Commitments outstanding.

This record will show the amount of financing commitments made and outstanding to small business concerns, including commitments for loans and for the acquisition of small business concerns' capital stock and debt securities. This record also will show the amount of deferred participations. A deferred participation is defined as a commitment under a participation agreement whereby the "participating" company will make funds available on a deferred basis to the "initiating" company in connection with the latter's financing of, or commitment to finance, a small business concern, or in connection with an "initiating" small business investment company's acquisition of loans or equity securities from other such companies. When funds are advanced against commitments, appropriate entry will be made in this record.

CL–17 Other contingent liabilities.

This record will show the amount of miscellaneous contingent obligations not otherwise classified.

Options on Company's Stock

OCS–1 Options on company's stock.

This record will show details of outstanding options on the company's capital stock granted in lieu of salary or in payment for services actually rendered to the company. The following data will be included:

1. Identification of person or entity holding options.
2. Number of shares optioned.
3. Type and class of stock called for by options.
4. Dates of grant and of expiration of options.
5. Price or prices at which options exercisable, with dates they apply.
6. Fair market value, per share, of stock called for at date each option was granted.
7. Price of each option as percent of fair market value of optioned stock at date option was granted.
8. Provisions for termination of options in case of death or retirement of optionees, or other circumstances.
9. Details of authorization, shares reserved for, issuance, exercise, lapse, and forfeiture of options provided for under the company's stock option plan.

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