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with the cargo liquid or vapor. (Equivalent to § 151.58–1(a).)

(h) Alkaline or acidic materials, such as caustic soda or sulfuric acid, should not be allowed to contaminate this cargo.

(i) For concentrations of 98 percent or greater, aluminum or stainless steel shall be used as materials of construction. For concentrations of less than 98 percent, 304L or 316 stainless steel shall be used as materials of construction.

(j) Zinc, alloys that have more than 10 percent zinc by weight, and aluminum may not be used as materials of construction for tanks, pipelines, valves, fittings, and other items of equipment that may come in contact with cargo liquid or vapor. (Equivalent to § 151.56–1(a) and (c).)

[CGFR 70–10, 35 FR 3714, Feb. 25, 1970, as amended by CGD 73–275R, 41 FR 3087, Jan. 21, 1976; CGD 75–223, 42 FR 8378, Feb. 10, 1977; CGD 88–100, 54 FR 40041, Sept. 29, 1989]

Subpart 151.56—Prohibited Materials of Construction

§ 151.56–1 Prohibited materials.

When one of the following paragraphs of this section is referenced in table 151.05, the materials listed in that paragraph may not be used in components that contact the cargo or its vapor:

(a) Aluminum or aluminum alloys.

(b) Copper or copper alloys.

(c) Zinc, galvanized steel, or alloys having more than 10 percent zinc by weight.

(d) Magnesium.

(e) Lead.

(f) Silver or silver alloys.

(g) Mercury.

[CGD 88–100, 54 FR 40041, Sept. 29, 1989]

Subpart 151.58—Required Materials of Construction

§ 151.58–1 Required materials.

When one of the following paragraphs of this section is referenced in table 151.05, only those materials listed in that paragraph may be used in components that contact the cargo or its vapor:

(a) Aluminum, stainless steel, or steel covered with a protective lining or coating. (See § 151.15–3(f)(2).)

(b)–(c) [Reserved]

(d) Solid austenitic stainless steel.

(e) Stainless steel or steel covered with a suitable protective lining or coating. (See § 151.15–3(f)(2).)

[CGD 88–100, 54 FR 40041, Sept. 29, 1989]

PART 152 [RESERVED]

PART 153—SHIPS CARRYING BULK LIQUID, LIQUEFIED GAS, OR COMPRESSED GAS HAZARDOUS MATERIALS

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TABLE 2—CARGOES NOT REGULATED UNDER SUBCHAPTERS D OR O OF THIS CHAPTER WHEN CARRIED IN BULK ON NON-OCEANGOING BARGES

APPENDIX I [RESERVED]
APPENDIX II METRIC UNITS USED IN PART 153

AUTHORITY: 46 U.S.C. 3703; 49 CFR 1.46. Section 153.40 issued under 49 U.S.C. 5103. Sections 153.470 through 153.491, 153.1100 through 153.1132, and 153.1600 through 153.1608 also issued under 33 U.S.C. 1903 (b).

SOURCE: CGD 73–96, 42 FR 49027, Sept. 26, 1977, unless otherwise noted.

EDITORIAL NOTE: Nomenclature changes for Part 153 appear at CGD 81–101, 52 FR 7777, Mar. 12, 1987, 59 FR 17028, Apr. 11, 1994, CGD 95–072, 60 FR 50465, Sept. 29, 1995 and at CGD 96–041, 61 FR 50732, Sept. 27, 1996.

Subpart A—General

§ 153.0 Availability of materials.

(a) Various sections in this part refer to the following documents which are incorporated in Annex II of MARPOL 73/78.

(1) IMO *Standards for Procedures and Arrangements for the Discharge of Noxious Liquid Substances,* Resolution MEPC 18(22), 1985 in effect on April 6, 1987.

(2) IMO *International Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk,* Resolution MEPC 19(22), 1985 in effect on April 6, 1987.

(3) IMO *Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk,* Resolution MEPC 20(22), 1985 in effect on April 6, 1987.

(b) The IMO documents listed in this section are available from the following:

(1) IMO Secretariat, Publications section, 4 Albert Embankment, London SE1 7SR, United Kingdom, Telex 23588;

(2) New York Nautical Instrument and Service Company, 140 West Broadway, New York, NY 10013;

(3) Baker, Lyman & Company, 3220 South I–10 Service Road, Metairie, LA 70001.

(4) UNZ & Company, 190 Baldwin Avenue, Jersey City, NJ 07306.

(5) Southwest Instrument Company, 235 West 7th Street, San Pedro, CA 90731.

(6) Marine Education Textbooks, 124 North Van Avenue, Houma, LA 70363–5895.

[CGD 81–101, 52 FR 7777, Mar. 12, 1987, as amended by CGD 92–100, 59 FR 17028, Apr. 11, 1994]

§ 153.1 Applicability.

This part applies to the following:

(a) All United States self-propelled ships and those foreign self-propelled ships operating in United States waters that carry in bulk a cargo listed in Table 1 or allowed in a written permission under § 153.900(d), unless—

(1) The ship is carrying the cargo under 33 CFR part 151;

(2) The ship is carrying the cargo in a portable tank under subpart 98.30 or 98.33 of this chapter; or

(3) The ship is an offshore supply vessel carrying the cargo under subpart 98.31 of the chapter; or

(b) All United States oceangoing non-self-propelled ships and those foreign non-self-propelled ships operating in United States waters that carry in bulk a Category A, B, or C NLS cargo listed in Table 1 or allowed in a written permission under § 153.900(d), unless—

(1) The ship is carrying the cargo under 33 CFR part 151;

(2) The ship is carrying the cargo in a portable tank under subpart 98.30 or 98.33 of this chapter;

(3) The ship is an offshore supply vessel carrying the cargo under subpart 98.31 of this chapter; or

(4) The ship's Certificate of Inspection is endorsed for a limited short protected coastwise route and the ship is constructed and certificated primarily for service on an inland route.

(c) All ships that carry a bulk liquid, liquefied gas, or compressed gas cargo that is not—

(1) Listed in Table 1 of this part;

(2) Listed in Table 2 of this part;

(3) Carried under a written permission granted under § 153.900(d);

(4) Carried under part 30 through 35, 98, 151, or 154 of this chapter; or

(5) Carried as an NLS under 33 CFR part 151.

[CGD 81–101, 52 FR 7777, Mar. 12, 1987, as amended by CGD 84–025, 53 FR 15844, May 4, 1988; CGD 81–101, 53 FR 28974, Aug. 1, 1988 and 54 FR 12629, Mar. 28, 1989; CGD 84–043, 55 FR 37413, Sept. 11, 19905; CGD 96–041, 61 FR 50732, Sept. 27, 1996]

§ 153.2 Definitions and acronyms.

As used in this part:

Accommodation spaces means halls, dining rooms, lounges, lavatories, cabins, staterooms, offices, hospitals, cinemas, game and hobby rooms, pantries containing no cooking appliances, and similar permanently enclosed spaces.

Adequate reception facility means each facility certified as adequate under 33 CFR 158.160 and each facility provided by a Administration signatory to MARPOL 73/78 under Regulation 7 of Annex II.

Annex II means Annex II to MARPOL 73/78 and is the Annex to MARPOL 73/78 regulating the discharge of noxious liquid substances to the sea.

B means the breadth of the vessel and is defined in § 42.13–15(d) of this chapter.

Built means that a ship's construction has reached any of the following stages:

(1) The keel is laid.

(2) The mass of the partially assembled ship is 50,000 kg.

(3) The mass of the partially assembled ship is one percent of the estimated mass of the completed ship.

Cargo area means that part of a vessel that includes the cargo tanks, spaces adjacent to the cargo tanks and the part of the deck over the cargo tanks and adjacent spaces.

Cargo containment system means a cargo tank, its cargo piping system, its venting system, and its gauging system.

Cargo handling space means an enclosed space that must be entered during a routine loading, carriage, or discharge of cargo and that contains an element of the cargo containment system having a seal or packing to prevent the escape of cargo, such as a valve, cargo pump, or cargo vapor compressor.

Cargo piping system means a tankship's permanently installed piping arrangement, including any valves and pumps, that carries cargo to or from a cargo tank.

Cargo tank means a tank that:

(1) Is part of or permanently affixed to a tankship; and

(2) Carries a cargo described in §153.5 in any quantity, including residual liquid or vapor.

Certificate of Compliance means a certificate issued by the Coast Guard that a foreign flag vessel had been examined and found to comply with the regulations in this chapter.

Closed gauging system means an arrangement for gauging the amount of cargo in a tank, such as a float and tape or a magnetically coupled float and indicator, that does not have any opening through which cargo vapor or liquid can escape.

Combustible is defined in §30.10–15 of this chapter.

Commandant means Commandant of the U.S. Coast Guard.

The term is often followed by a mailing code in parentheses. The mailing address should include any mailing code and should be written as follows:

Commandant (mailing code), U.S. Coast Guard, 2100 Second Street SW. Washington, D.C. 20593–0001.

Control space is defined in §30.10–19a of this chapter.

Cycle, means that the tank washing machine progresses through complete rotations until it reaches an orientation identical to its starting orientation.

NOTE: For a typical one or two nozzle tank washing machine that rotates in both the horizontal and vertical planes though more slowly in one than the other, a cycle would be at least one rotation in each plane of rotation.

Dedicated ballast tank means a tank that is used only for ballast.

Emergency shutdown station means a part of the tankship where the required emergency shutdown controls are clustered.

Flammable is defined in §30.10–22 of this chapter.

Forward perpendicular is defined in §42.13–15(b) of this chapter.

Hazardous material means a liquid material or substance that is—

(1) Flammable or combustible;

(2) Designated a hazardous substance under section 311(b) of the Federal Water Pollution Control Act (33 U.S.C. 1321); or

(3) Designated a hazardous material under 49 U.S.C. 5103.

NOTE: The Environmental Protection Agency designates hazardous substances in 40 CFR Table 116.A. The Coast Guard designates hazardous materials that are transported as bulk liquids by water in §153.40.

High viscosity NLS includes high viscosity Category B NLS and high viscosity Category C NLS.

High viscosity Category B NLS means any Category B NLS having a viscosity of at least 25 mPa.s at 20 °C and at least 25 mPa.s at the time it is unloaded.

High viscosity Category C NLS means any Category C NLS having a viscosity of at least 60 mPa.s at 20 °C and at least 60 mPa.s at the time it is unloaded.

IMO means the International Maritime Organization (IMO, formerly Inter-Governmental Maritime Consultative Organization or IMCO).

IMO Bulk Chemical Code includes the IMO *International Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk,* Resolution MEPC 19(22), 1985 and the IMO *Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk,* Resolution MEPC 20(22), 1985.

IMO Certificate includes a Certificate of Fitness for the Carriage of Dangerous Chemicals in Bulk issued under the IMO *Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk,* Resolution MEPC 20(22), 1985 and an International Certificate of Fitness for the Carriage of Dangerous Chemicals in Bulk issued under the IMO *International Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk,* Resolution MEPC 19(22), 1985.

Independent, as applied to a cargo piping, venting, heating or cooling system means that the system is connected to no other system, and has no means available for connection to another system.

Independent tank means a cargo tank that is permanently affixed to the vessel, that is self-supporting, that incorporates no part of the vessel's hull and that is not essential to the integrity of the hull.

Intank cargo pump means a pump:

(1) Located within the cargo tank it serves; and

(2) Whose piping passes through only the top of the cargo tank.

Integral tank means a cargo tank that also is part of or is formed in part by the vessel's hull structure so that the tank and the hull may be stressed by the same loads.

IOPP Certificate means an International Oil Pollution Prevention Certificate required under 33 CFR 151.19.

L means the length of the vessel and is defined in §42.13–15(a) of this chapter.

Liquid means each substance having a vapor pressure of 172 kPa or less at 37.8 °C.

Marine Inspector is defined in §30.10–43 of this chapter.

MARPOL 73/78 means the International Convention for Prevention of Pollution from Ships, 1973 (done at London, November 2, 1973), modified by the Protocol of 1978 relating to the International Convention for Prevention of Pollution from Ships, 1973 (done at London, on February 17, 1978).

Master means the person-in-charge of a self-propelled or non-self-propelled ship.

Mixture means a mixture containing only the substances described in conjunction with the term.

Nearest land has the same meaning as in 33 CFR 151.05(h).

Noxious liquid substance (NLS) means—

(1) Each substance listed in 33 CFR 151.47 or 33 CFR 151.49;

(2) Each substance having an ''A,'' ''B,'' ''C,'' or ''D'' beside its name in the column headed ''Pollution Category'' in Table 1; and

(3) Each substance that is identified as an NLS in a written permission issued under §153.900(c).

NLS Certificate means an International Pollution Prevention Certificate for the Carriage of Noxious Liquid Substances in Bulk issued under Annex II of MARPOL 73/78.

Oceangoing ship has the same meaning as in 33 CFR 151.05(j).

Officer in Charge, Marine Inspection, is defined in §1.05(b) of this chapter.

Open gauging means an arrangement for gauging the amount of cargo in a tank through a large opening, such as a tank hatch or ullage opening.

Open venting system means a venting system that always allows vapor to flow freely to and from the tank.

Phosphoric acid means phosphoric acid, superphosphoric acid, and aqueous solutions of phosphoric acid.

Pressure-vacuum (PV) valve means a valve that is normally closed and which opens under a preset positive pressure or a vacuum.

Prewash means a tank washing operation that meets the procedure in §153.1120.

Pumproom means any enclosed space containing a pump that is part of a cargo containment system.

Reception facility means anything capable of receiving NLS residues in a country whose Administration is not signatory to MARPOL 73/78 and each adequate reception facility.

Refrigerated tank means a cargo tank that is equipped to carry a cargo that must be cooled in order to keep the cargo's vapor pressure from exceeding the tank's pressure-vacuum or safety relief valve setting under ambient conditions of 32° C (approx. 90°F) still water and 46°C (approx. 115°F) still air.

Relief valve setting means the inlet line pressure at which a vent system's pressure-vacuum or safety relief valve fully opens.

Residues and mixtures containing NLSs (NLS residue) means—

(1) Any Category A, B, C, or D NLS cargo retained on the ship because it fails to meet consignee specifications;

(2) Any part of a Category A, B, C, or D NLS cargo remaining on the ship after NLS is discharged to the consignee, including but not limited to puddles on the tank bottom and in sumps, clingage in the tanks, and substance remaining in the pipes; or

(3) Any material contaminated with a Category A, B, C, or D NLS cargo, including but not limited to bilge slops, ballast, hose drip pan contents, and tank wash water.

Restricted gauging system means a method of gauging the amount of cargo in a tank through an opening of limited size that restricts or prevents the release of cargo vapors from the tank vapor space.

Safety relief (SR) valve means a normally closed valve that opens under a preset positive pressure.

Separate and *separated,* as applied to a cargo piping, venting, heating or cooling system, means either an independent system or one that may be disconnected from all other systems by:

(a) Removing spool pieces or valves and blanking the open pipe ends; or

(b) Blocking each system interconnection with two blind flanges in series and providing a means of detecting leakage into the pipe section between the flanges.

Service spaces means spaces outside the cargo area used for galleys, pantries containing cooking appliances, lockers, store rooms, workshops other than those forming part of machinery spaces, and trunks to such spaces.

Ship means a vessel of any type whatsoever, including hydrofoils, air-cushion vehicles, submersibles, floating craft whether self-propelled or not, and fixed or floating platforms.

Slop tanks include slop tanks and cargo tanks used as slop tanks.

Solidifying NLS means a Category A, B, or C NLS that has a melting point—

(1) Greater than 0 °C but less than 15 °C and a temperature, measured under the procedure in §153.908(d), that is less than 5 °C above its melting point at the time it is unloaded; or

(2) 15 °C or greater and has a temperature, measured under the procedure in §153.908(d), that is less than 10 °C above its melting point at the time it is unloaded.

Solution means a water solution.

Special area means the Baltic Sea Area as defined in 33 CFR 151.13(a)(2) and the Black Sea Area as defined in 33 CFR 151.13(a)(3).

SR venting system means a venting system in which an SR valve controls vapor flow from the cargo tank.

Tankship has the same meaning as ''ship''.

Venting system means a permanent piping arrangement leading from a cargo tank and used to control the flow of vapor to and from the tank.

[CGD 73–96, 42 FR 49027, Sept. 26, 1977, as amended by CGD 78–128, 47 FR 21204, May 17, 1982; CGD 81–052, 50 FR 8732, Mar. 5, 1985; CGD 81–078, 50 FR 21170, May 22, 1985; CGD 81–101, 52 FR 7778, Mar. 12, 1987; CGD 81–101, 53 FR 28974, Aug. 1, 1988; CGD 88–070, 53 FR 34535, Sept. 7, 1988; CGD 81–101, 54 FR 12629, Mar. 28, 1989; CGD 96–041, 61 FR 50732, Sept. 27, 1996; CGD 95–028, 62 FR 51209, Sept. 30, 1997]

EFFECTIVE DATE NOTE: At 62 FR 51209, Sept. 30, 1997, in §153.2, paragraph (3) (but not the Note) in the definition of *Hazardous material* was revised by CGD 95–028, effective Oct. 30, 1997. For the convenience of the user the superseded text is set forth as follows:

§153.2 Definitions and acronyms.

* * * * *

Hazardous material means a liquid material or substance that is—

* * * * *

(3) Designated a hazardous material under section 104 of the Hazardous Material Transportation Act (HMTA) (49 U.S.C. 1803).

* * * * *

§153.3 Right of appeal.

Any person directly affected by a decision or action taken under this part, by or on behalf of the Coast Guard, may appeal therefrom in accordance with subpart 1.03 of this chapter.

[CGD 88–033, 54 FR 50381, Dec. 6, 1989]

§ 153.4 Incorporation by reference.

(a) Certain material is incorporated by reference into this part with the approval of the Director of the Federal Register in accordance with 5 U.S.C. 552(a). To enforce any edition other than that specified in paragraph (b) of this section, the Coast Guard must publish notice of change in the FEDERAL REGISTER and make the material available to the public. All approved material is on file at the Office of the Federal Register, 800 North Capitol Street NW., suite 700, Washington, DC, and at the U.S. Coast Guard, Office of Operating and Environmental Standards (G–MSO), 2100 Second Street SW., Washington, DC 20593–0001 and is available from the sources indicated in paragraph (b) of this section.

(b) The material approved for incorporation by reference in this part and the sections affected are:

American National Standards Institute (ANSI)

11 West 42nd Street, New York, NY 10036

ANSI B16.5, Pipe Flanges and Flanged Fittings, 1988 .....153.940

ANSI B16.24, Bronze Pipe Flanges and Flanged Fittings, 1979.....153.940

ANSI B16.31, Non-Ferrous Flanges, 1971.....153.940

American Society for Testing and Materials (ASTM)

100 Barr Harbor Drive, West Conshohocken, PA 19428–2959

ASTM F–1122, Standard Specification for Quick Disconnect Couplings, 1987.....153.940

ASTM F–1271, Standard Specification for Spill Valves for use in Marine Tank Liquid Overpressure Protection Applications, 1989.....153.365

[CGD 88–032, 56 FR 35826, July 29, 1991, as amended by CGD 96–041, 61 FR 50732, Sept. 27, 1996; CGD 97–057, 62 FR 51048, Sept. 30, 1997]

§ 153.7 Ships built before December 27, 1977 and non-self-propelled ships built before July 1, 1983: Application.

(a) *Definitions.*

(1) *Permit* means a Certificate of Inspection, Letter of Compliance, or Certificate of Compliance.

(2) *Existing tankship* means a tankship for which a contract was let on or before December 27, 1977.

(3) *Letter of Compliance* in this section means a letter issued by the Coast Guard before 27 December 1977 which permitted a foreign flag tankship to carry a bulk cargo regulated under this part.

(b) *Endorsements for existing tankships.* (1) The Coast Guard endorses the permit of an existing tankship to carry a cargo listed in Table 1 if:

(i) The tankship held a permit on December 27, 1977, endorsed for the cargo in question;

(ii) The tankship meets the construction standards under which the Coast Guard issued the permit; and

(iii) The tankship meets the standards in paragraph (c) of this section.

(2) The Coast Guard endorses the permit of an existing tankship to carry a cargo listed in Table 1 if:

(i) The tankship held a permit on December 27, 1977;

(ii) The Coast Guard did not require the permit to be endorsed with the name of the cargo at any time before December 27, 1977;

(iii) The tankship meets the construction standards under which the Coast Guard issued the permit;

(iv) The tankship carried the cargo in question; and

(v) The tankship meets the standards in paragraph (c) of this section.

(3) The Coast Guard endorses the permit of an existing tankship to carry a cargo listed in Table 1 if:

(i) The tankship held a permit on December 27, 1977 endorsed to carry class B or C poisons under 46 CFR part 39;

(ii) The cargo in question is a class B or C poison;

(iii) The tankship meets the construction standards in 46 CFR part 39; and

(iv) The tankship meets the standards in paragraph (c) of this section.

(4) The Commandant (G–MSO) considers on a case by case basis endorsing the permit of an existing tankship to carry a cargo listed in Table 1 if:

(i) The tankship does not come within the categories described in paragraphs (b) (1) through (3) of this section;

(ii) The tankship meets paragraph (c) of this section; and

(iii) The tankship meets any additional requirements the Commandant (G–MSO) may prescribe.

(c) An existing tankship must meet all the requirements of this part except as provided in paragraphs (c) (3), (4), (5) and (6) of this section.

(1)–(2) [Reserved]

(3) The Commandant (G–MSO) considers on a case by case basis endorsing as a type II containment system one that fails to meet §§153.231(b), 153.234, 172.130 and 172.133 of this chapter if the tankship and containment system meet the following minimum conditions:

(i) The tankship has a loadline certificate.

(ii) The cargo tank is not part of the tankship's shell plating.

(iii) The distance between the bottom plating of the cargo tank and the bottom shell plating of the tankship is at least 76 cm measured parallel to the vertical axis of the tankship.

(4) The Commandant (G–MSO) considers on a case by case basis endorsing a containment system as a type II containment system if:

(i) The containment system is modified to meet §153.231(b) by adding double bottoms or wing tanks; and

(ii) The tankship can survive the damage described in §§172.135 and 172.150 of this chapter to those parts of the tankship other than machinery spaces.

(5) The Commandant (G–MSO) considers on a case by case basis endorsing as a type III containment system one that does not meet §§153.234, 172.130 and 172.133 of this chapter if the tankship has a load line certificate.

(6) The Commandant (G–MSO) considers on a case by case basis endorsing the tankship to carry cargoes listed in Table 1 of this part if the tankship does not meet §§153.217, 153.219 and 153.254.

(d) Except as required by this paragraph, subpart B of this part does not apply to a non-self-propelled ship that carries an NLS cargo under this part if—

(1) The ship was built before July 1, 1983;

(2) The ship carries no NLS cargo or NLS residue at any time it is in waters of another Administration signatory to MARPOL 73/78;

(3) The NLS does not require a type I containment system;

(4) The ship meets all requirements in parts 30 through 34 and part 151 of this chapter that apply to the cargo;

(5) The ship meets the provisions in §153.216 and §§153.470 through 153.491 applying to the NLS category of that cargo;

(6) When the ''Special Requirements'' column of Table 1 contains an entry for §153.408 or §153.409 beside the cargo name, the ship meets the section, except the system prescribed by the section need be capable of operation only during loading;

(7) [Reserved]

(8) No part of the ship's hull plating is a component of a cargo tank if the cargo tank is endorsed to carry a cargo having a type II containment system in Table 1.

[CGD 73–96, 42 FR 49027, Sept. 26, 1977, as amended by CGD 78–128, 47 FR 21204, May 17, 1982; CGD 82–063b, 48 FR 4781, Feb. 3, 1983; CGD 79–023, 48 FR 51009, Nov. 4, 1983; CGD 81–052, 50 FR 8733, Mar. 5, 1985; CGD 81–101, 52 FR 7779, Mar. 12, 1987; CGD 81–101, 53 FR 28974, Aug. 1, 1988 and 54 FR 12629, Mar. 28, 1989; CGD 95–072, 60 FR 54106, Oct. 19, 1995]

§153.8 Procedures for requesting an endorsed Certificate of Inspection.

(a) When applying for the endorsed Certificate of Inspection that §153.900 requires for a ship to carry a cargo listed in Table 1, the applicant must proceed as follows:

(1) Send a letter to one of the Coast Guard offices listed in §91.55–15 of this chapter that includes—

(i) A request for the endorsed Certificate of Inspection;

(ii) The name of the ship; and

(iii) A list of the cargoes from Table 1 the applicant wishes the endorsement to allow.

(2) Supply to the Coast Guard when requested—

(i) Hull type calculations;

(ii) The plans and information listed in §§54.01–18, 56.01–10, 91.55–5 (a), (b), (d), (g), and (h), and 110.25–1 of this chapter;

(iii) A copy of the Procedures and Arrangements Manual required by §153.490; and

(iv) Any other ship information, including plans, design calculations, test results, certificates, and manufacturer's data, that the Coast Guard needs to determine if the ship meets this part.

(b) The Coast Guard notifies the applicant in writing—

(1) Whether any further information is necessary to evaluate the request for the endorsed Certificate of Inspection; and

(2) Of the outcome of the request for the endorsed Certificate of Inspection.

(c) The Coast Guard returns the Procedures and Arrangements Manual stamped ''Approved'' or indicating what corrections are necessary.

NOTE: The procedures for requesting an IOPP Certificate are found in 33 CFR Part 151.

[CGD 81–101, 52 FR 7779, Mar. 12, 1987]

§ 153.9 Foreign flag vessel endorsement application.

(a) *Application for a vessel whose flag administration is signatory to MARPOL 73/78 and issues IMO Certificates.* A person who desires a Certificate of Compliance endorsed to carry a cargo in table 1 of this part, as described in § 153.900 of this part, must request the endorsement from the cognizant Officer in Charge, Marine Inspection and have aboard the vessel copies of IMO Certificates issued by the vessel's administration and—

(1) An additional classification society statement that the vessel complies with § 153.530 (b), (d), and (p)(1) if a person desires a Certificate of Compliance endorsed with the name of an alkylene oxide; and

(2) An additional classification society statement that the vessel complies with §§ 153.370, 153.371, and 153.438 if a person desires a Certificate of Compliance endorsed with the name of a cargo whose vapor pressure exceeds 100 kPa absolute at 37.8 ° C (approximately 14.7 psia at 100 ° F).

(b) *Application for a vessel whose flag administration does not issue IMO Certificates.* A person who desires a Certificate of Compliance[1] endorsed with the name of a cargo in Table 1 of this part, as described in § 153.900, must submit to Commanding Officer, U.S. Coast Guard Marine Safety Center (MSC), 400 Seventh St., SW., Washington, DC 20590–0001 an application that includes the following information:

(1) A copy of the vessel's Cargo Ship Safety Construction Certificate and Cargo Ship Safety Equipment Certificate issued under the International Convention for Safety of Life at Sea, 1974.

(2) A list of those cargoes for which the Letter of Compliance is to be endorsed.

(3) The specific tanks that are to be endorsed for each cargo.

(4) The names of the U.S. ports in which the person anticipates operating the vessel.

(5) The name of the vessel's flag administration.

(6) The name of the society that classes the vessel.

(7) A brief description of the vessel's cargo containment systems.

(8) Hull type calculations.

(9) The plans and information listed in §§ 54.01–18, 56.01–10, 91.55–5 (a), (b), (d), (g), and (h), and 111.05–5(d) of this chapter.

(c) *Conditions applying to all Certificate of Compliance applications.* (1) If requested by the Commanding Officer, U.S. Coast Guard Marine Safety Center (MSC), 400 Seventh St., SW., Washington, DC 20590–0001, a person desiring a Certificate of Compliance for a vessel must furnish any other vessel information such as plans, design calculations, test results, certificates, and manufacturer's data, that the Coast Guard needs to determine that the vessel meets the standards of this part.

(2) Correspondence with the Coast Guard and vessel information submitted under this part must be in English except IMO Certificates which may be in French.

[CGD 73–96, 42 FR 49027, Sept. 26, 1977, as amended by CGD 81–052, 50 FR 8733, Mar. 5, 1985; 50 FR 15895, Apr. 23, 1985; CGD 88–070, 53 FR 34535, Sept. 7, 1988; CGD 88–070, 53 FR 37570, Sept. 27, 1988; CGD 89–025, 54 FR 19571, May 8, 1989; CGD 90–008, 55 FR 30663, July 26, 1990; CGD 92–100, 59 FR 17028, Apr. 11, 1994; CGD 95–027, 61 FR 26008, May 23, 1996]

§ 153.10 Procedures for requesting alternatives and waivers; termination of waivers.

(a) The Coast Guard considers allowing the use of an alternative in place of a requirement in this part if—

(1) The person wishing to use the alternative sends a written application to the Commandant (G–MSO) explaining—

(i) The requirement in this part that would not be met and the reason why;

(ii) The alternative the person proposes to be substituted; and

(iii) How the alternative would ensure a level of safety and pollution protection at least equal to that of the requirement for which the alternative would substitute;

(2) The alternative does not substitute an operational standard for a design or equipment standard; and

(3) The Commandant (G–MSO) determines that the alternative provides a level of protection for purposes of safety and pollution at least equal to the requirement in this part.

(b) The Coast Guard considers granting a waiver of a requirement for which this part allows a waiver if the person wishing the waiver sends a written application to the Commandant (G–MSO) that includes—

(1) A citation of the regulation that allows the waiver; and

(2) Any information and pledges that the regulation requires to be submitted with the application for the waiver.

(c) The Commandant notifies the applicant in writing—

(1) Whether any further information is necessary to evaluate the request for an alternative or waiver; and

(2) Of the outcome of the request for an alternative or waiver.

(d) A waiver issued under this part terminates if any—

(1) Information required to be supplied with the application for the waiver changes;

(2) Pledges required to be supplied with the application for the waiver are repudiated;

(3) Restrictions or procedures applying to operations under the waiver are violated; or

(4) Requirements in the section of this part authorizing the waiver are violated.

[CGD 81–101, 52 FR 7780, Mar. 12, 1987]

§153.12 IMO Certificates for United States Ships.

The Officer in Charge, Marine Inspection issues a United States ship an IMO Certificate endorsed to allow the carriage of a hazardous material or NLS cargo in Table 1 if the following requirements are met:

(a) The ship's owner must make a request to the OCMI for the IMO Certificate.

(b) The ship must meet this part.

(c) Self-propelled ships contracted for after November 1, 1973 but built before December 28, 1977 must meet requirements in this part that apply to a self-propelled ship built on December 28, 1977.

(d) Non-self-propelled ships contracted for after November 1, 1973 but built before July 1, 1983 must meet the requirements in this part applying to non-self-propelled ships built on July 1, 1983.

[CGD 81–101, 52 FR 7780, Mar. 12, 1987]

§153.15 Conditions under which the Coast Guard issues a Certificate of Inspection or Certificate of Compliance.

(a) The Coast Guard issues the endorsed Certificate of Inspection required under §153.900 for a United States ship to carry a hazardous material or NLS listed in Table 1 if—

(1) The person wishing the Certificate of Inspection applies following the procedures under §153.8; and

(2) The ship meets the design and equipment requirements of this part and—

(i) Subchapter D of this chapter if the hazardous material or NLS is flammable or combustible; or

(ii) Either Subchapter D or I of this chapter, at the option of the ship owner, if the hazardous material or NLS is non-flammable or non-combustible.

(b) The Coast Guard issues the endorsed Certificate of Compliance required under §153.900 for a foreign ship to carry a hazardous material or NLS listed in Table 1 if—

(1) The person wishing the Certificate of Compliance follows the procedures under §153.9;

(2) The ship has an IMO Certificate issued by its Administration and endorsed with the name of the hazardous material or NLS if the ship's Administration is signatory to MARPOL 73/78;

(3) The ship meets the requirements of this part applying to United States ships and §30.01–5(e) of this chapter if the ship's Administration is not signatory to MARPOL 73/78; and

(4) The ship meets any additional design and equipment requirements specified by the Commandant (G–MSO).

[CGD 81–101, 52 FR 7780, Mar. 12, 1987]

§ 153.16 Requirements for foreign flag vessel permits.

To have its Certificate of Compliance endorsed to carry a cargo listed in Table 1, a foreign flag vessel must:

(a) Have an IMO Certificate, if the flag administration issues IMO Certificates, endorsed with the name of the cargo and meet any specific requirements in this subpart that the Commandant (G–MSO) may prescribe; or

(b) Meet the requirements of this subpart and § 30.01–5(e) of this chapter.

[CGD 73–96, 42 FR 49027, Sept. 26, 1977, as amended by CGD 82–063b, 48 FR 4781, Feb. 3, 1983; CGD 81–052, 50 FR 8733, Mar. 5, 1985; CGD 81–101, 52 FR 7780, Mar. 12, 1987; CGD 95–027, 61 FR 26008, May 23, 1996]

§ 153.30 Special area endorsement.

The Coast Guard endorses the Certificate of Inspection of a United States ship allowing it to operate in special areas if the ship owner—

(a) Requests the endorsement following the procedures in § 153.8;

(b) Shows that the ship meets the design and equipment requirements applying to ships operating in special areas contained in Regulations 5, 5A, and 8 of Annex II and the Standards for Procedures and Arrangements.

[CGD 81–101, 52 FR 7780, Mar. 12, 1987]

§ 153.40 Determination of materials that are hazardous.

Under the authority delegated by the Secretary of Transportation in 49 CFR 1.46(t) to carry out the functions under 49 U.S.C. 1803, the Coast Guard has found the following materials to be hazardous when transported in bulk:

(a) Materials listed in Table 30.25–1 of this chapter.

(b) Materials listed in Table 151.05.

(c) Materials listed in Table 1.[1]

(d) Materials listed in Table 4 of Part 154.

(e) Materials that are NLSs under MARPOL Annex II.

(f) Liquids, liquefied gases, and compressed gases, that are—

(1) Listed in 49 CFR 172.101;

(2) Listed in 49 CFR 172.102; or

(3) Listed or within any of the definitions in subparts C through O of 49 CFR part 173.

(g) Those liquid, liquefied gas, and compressed gas materials designated as hazardous in the permissions granted under § 153.900(c).[2]

[CGD 81–101, 52 FR 7780, Mar. 12, 1987]

Subpart B—Design and Equipment

GENERAL VESSEL REQUIREMENTS

§ 153.190 Stability requirements.

Each vessel must meet the applicable requirements in Subchapter S of this chapter.

[CGD 79–023, 48 FR 51009, Nov. 4, 1983. Redesignated by CGD 81–101, 52 FR 7780, Mar. 12, 1987]

§ 153.201 Openings to accommodation, service or control spaces.

(a) Except as allowed in paragraph (b) of this section, entrances, ventilation intakes and exhausts, and other openings to accommodation, service, or control spaces must be located aft of the house bulkhead facing the cargo area a distance at least equal to the following:

(1) 3 m (approx. 10 ft) if the vessel length is less than 75 meters (approx. 246 ft).

(2) L/25 if the vessel length is between 75 and 125 meters (approx. 246 ft and 410 ft).

(3) 5 m (approx. 16.5 ft) if the vessel length is more than 125 meters (approx. 410 ft).

(b) Fixed port lights, wheelhouse doors, and windows need not meet the location requirements specified in paragraph (a) of this section if they do

[1] Those hazardous material cargoes designated Category A, B, C, or D in Table 1 are also Noxious Liquid Substances under Annex II and the Act to Prevent Pollution from Ships, 33 U.S.C. 1901 *et seq.*

[2] The Coast Guard continues to propose in the FEDERAL REGISTER any addition of these designated hazardous materials to one of the tables referred to in paragraphs (a) through (d).

not leak when tested with a fire hose at 207 kPa gauge (30 psig).

[CGD 81–078, 50 FR 21173, May 22, 1985]

§ 153.208 Ballast equipment.

(a) Except for the arrangement described in paragraph (b) of this section no piping that serves a dedicated ballast tank that is adjacent to a cargo tank may enter an engine room or accommodation space.

(b) Piping used only to fill a dedicated ballast tank adjacent to a cargo tank may enter an engine room or accommodation space if the piping has a valve or valving arrangement:

(1) Within the part of the tankship where a containment system may be located under § 153.234;

(2) That allows liquid to flow only towards that ballast tank (such as a check valve); and

(3) That enables a person to shut off the fill line from the weatherdeck (such as a stop valve).

(c) Except as prescribed in paragraph (d) of this section, pumps, piping, vent lines, overflow tubes and sounding tubes serving dedicated ballast tanks must not be located within a cargo containment system.

(d) Each vent line, overflow tube and sounding tube that serves a dedicated ballast tank and that is located within a cargo containment system must meet § 32.60–10(e)(2) of this chapter.

[CGD 73–96, 42 FR 49027, Sept. 26, 1977, as amended by CGD 78–128, 47 FR 21207, May 17, 1982]

§ 153.209 Bilge pumping systems.

Bilge pumping systems for cargo pumprooms, slop tanks, and void spaces separated from cargo tanks by only a single bulkhead must be entirely within the locations allowed containment systems in § 153.234.

§ 153.214 Personnel emergency and safety equipment.

Each self-propelled ship must have the following:

(a) Two stretchers or wire baskets complete with equipment for lifting an injured person from a pumproom or a cargo tank.

(b) In addition to any similar equipment required by Subchapter D of this chapter, three each of the following:

(1) A 30 minute self-contained breathing apparatus of the pressure demand type, approved by the Mining Safety and Health Administration (formerly the Mining Enforcement and Safety Administration) and the National Institute for Occupational Safety and Health, or the tankship's flag administration with five refill tanks or cartridges of 30 minutes capacity each.

(2) A set of overalls or large apron, boots, long sleeved gloves, and goggles, each made of materials resistant to the cargoes in Table 1 that are endorsed on the Certificate of Inspection or Certificate of Compliance.

(3) A steel-cored lifeline with harness.

(4) An explosion-proof lamp.

(c) First aid equipment.

[GCD 73–96, 42 FR 49027, Sept. 26, 1977, as amended by CGD 77–222, 43 FR 57256, Dec. 7, 1978; CGD 78–128, 47 FR 21207, May 17, 1982; CGD 81–052, 50 FR 8733, Mar. 5, 1985; CGD 81–101, 52 FR 7781, Mar. 12, 1987]

§ 153.215 Safety equipment lockers.

Each self-propelled ship must have the following:

(a) Each tankship must have at least two safety equipment lockers.

(b) One safety equipment locker must be adjacent to the emergency shutdown station required by § 153.296(b). This locker must contain one set of the equipment required by § 153.214(a) and two sets of that required by § 153.214(b).

(c) The second safety equipment locker must be adjacent to the second emergency shutdown station required by § 153.296. This locker must contain the remaining equipment required by § 153.214 (a) and (b).

(d) Each safety equipment locker must be marked as described in § 153.955 (c), (d), and (e) with the legend ''SAFETY EQUIPMENT.''

[CGD 73–96, 42 FR 49027, Sept. 26, 1977, as amended by CGD 78–128, 47 FR 21207, May 17, 1982; CGD 81–101, 52 FR 7781, Mar. 12, 1987]

§ 153.216 Shower and eyewash fountains.

(a) Each non-self-propelled ship must have a fixed or portable shower and eyewash fountain that operates during

cargo transfer and meets paragraph (c) of this section.

(b) Each self-propelled ship must have a shower and eyewash fountain that operates at all times and meets paragraph (c) of this section.

(c) The shower and eyewash fountains required by paragraphs (a) and (b) of this section must—

(1) Operate in any ambient temperature;

(2) Dispense water at a temperature between 0 °C and 40 °C (approx. 32 °F and 104 °F);

(3) Be located on the weatherdeck; and

(4) Be marked ''EMERGENCY SHOWER'' as described in § 153.955 (c), (d), and (e), so that the marking is visible from work areas in the part of the deck where the cargo containment systems are located.

[CGD 81–101, 52 FR 7781, Mar. 12, 1987]

§ 153.217 Access to enclosed spaces and dedicated ballast tanks.

An access opening to an enclosed space or a dedicated ballast tank must meet the requirements for a cargo tank access in § 153.254 (b), (c), and (d) if:

(a) The enclosed space or dedicated ballast tank is located within the cargo area of the vessel; or

(b) A part of a cargo containment system lies within the enclosed space or dedicated ballast tank.

[CGD 78–128, 47 FR 21207, May 17, 1982]

§ 153.219 Access to double bottom tanks serving as dedicated ballast tanks.

(a) Except as prescribed in paragraph (b) of this section, access openings to double bottom tanks serving as dedicated ballast tanks must not be located within a cargo containment system.

(b) Each access opening to a double bottom tank that is a dedicated ballast tank and that is located within a cargo containment system must be:

(1) Enclosed in an access trunk extending to the weatherdeck;

(2) Separated from the cargo containment system by two manhole coverings; or

(3) Approved by the Commandant (G–MSO).

[CGD 78–128, 47 FR 21207, May 17, 1982, as amended by CGD 82–063b, 48 FR 4782, Feb. 3, 1983]

CARGO CONTAINMENT SYSTEMS

§ 153.230 Type I system.

A type I containment system must meet the following requirements:

(a) The vessel must meet the requirements in subpart F of part 172 of this chapter for a type I hull.

(b) Except as described in § 153.235:

(1) It may be no closer to the tankship's shell than 76 cm (approx. 29.9 in.); and

(2) It may not be located in any part of the tankship subject to the damage described in Table 172.135 of this chapter for:

(i) COLLISION PENETRATION, Transverse extent; and

(ii) GROUNDING PENETRATION, Vertical extents from the baseline upward.

[CGD 73–96, 42 FR 49027, Sept. 26, 1977, as amended by CGD 79–023, 48 FR 51009, Nov. 4, 1983]

§ 153.231 Type II system.

A type II containment system must meet the following requirements:

(a) The vessel must meet the requirements in subpart F of part 172 of this chapter for a type I or II hull.

(b) Except as allowed in §§ 153.7 and 153.235—

(1) It may be no closer to the tankship's shell than 76 cm (approx. 29.9 in.); and

(2) It may not be located in any part of the tankship subject to the damage described in Table 172.135 of this chapter for GROUNDING PENETRATION, Vertical extent from the baseline upward.

[CGD 73–96, 42 FR 49027, Sept. 26, 1977, as amended by CGD 79–023, 48 FR 51009, Nov. 4, 1983; CGD 81–101, 52 FR 7781, Mar. 12, 1987]

§ 153.232 Type III system.

A type III containment system must be in either a type I, II, or III hull. The requirements for type I, II, and III hulls are in subpart F of part 172 of this chapter.

[CGD 79–023, 48 FR 51009, Nov. 4, 1983]

§ 153.233 Separation of tanks from machinery, service and other spaces.

(a) To prevent leakage through a single weld failure, the following spaces must be separated from a cargo by two walls, two bulkheads, or a bulkhead and a deck not meeting in a cruciform joint:

(1) Machinery spaces.

(2) Service spaces.

(3) Accommodation spaces.

(4) Spaces for storing potable domestic, or feed water.

(5) Spaces for storing edibles.

(b) Some examples of arrangements that may separate cargo from the spaces listed in paragraph (a) of this section are the following:

(1) Dedicated ballast tanks.

(2) Cargo pumprooms.

(3) Ballast pumprooms.

(4) Tanks not carrying a cargo listed in this part.[3]

(5) A cofferdam aft of the cargo containment systems and whose forward bulkhead is forward of any joint common to an accommodations space and the deck.

(6) Double walled piping or a piping tunnel.

§ 153.234 Fore and aft location.

Except as allowed in § 153.7, each ship must meet the following:

(a) Each cargo containment system and any compartments within which a containment system is located must be forward of a tankship's accommodation spaces.

(b) Except as described in § 153.235, each cargo containment system must be located at least 0.05L aft of the forward perpendicular, but in no case forward of a collision bulkhead.

[CGD 73–96, 42 FR 49027, Sept. 26, 1977, as amended by CGD 81–101, 52 FR 7781, Mar. 12, 1987]

§ 153.235 Exceptions to cargo piping location restrictions.

Cargo piping must not be located in those areas from which a containment system is excluded by §§ 153.230(b), 153.231(b), and 153.234(b) unless the cargo piping:

(a) Drains back to the cargo tank under any heel or trim resulting from the damage specified in § 172.135 of this chapter; and

(b) Enters the cargo tank above the liquid level for a full tank in any condition of heel or trim resulting from the damage specified in § 172.135 of this chapter.

[CGD 73–96, 42 FR 49027, Sept. 26, 1977, as amended by CGD 79–023, 48 FR 51009, Nov. 4, 1983]

§ 153.236 Prohibited materials.

When one of the following paragraphs of this section is referenced in Table 1, the materials listed in that paragraph may not be used in components that contact the cargo liquid or vapor:

(a) Aluminum or aluminum alloys.

(b) Copper or copper alloys.

(c) Zinc, galvanized steel or alloys having more than 10 percent zinc by weight.

(d) Magnesium.

(e) Lead.

(f) Silver or silver alloys.

(g) Mercury.

§ 153.238 Required materials.

When one of the following paragraphs of this section is referenced in Table 1, only those materials listed in that paragraph may be used in components that contact the cargo liquid or vapor:

(a) Aluminum, stainless steel, or steel covered with a protective lining or coating.

(b) With cargo concentrations of 98 percent or greater, aluminum or stainless steel.

(c) With cargo concentrations of less than 98 percent, 304L or 316 stainless steel.

(d) Solid austenitic stainless steel.

(e) Stainless steel or steel covered with a suitable protective lining or coating. (See § 153.266.)

[CGD 73–96, 42 FR 49027, Sept. 26, 1977, as amended by CGD 88–100, 54 FR 40041, Sept. 29, 1989]

§ 153.239 Use of cast iron.

(a) Cast iron used in a cargo containment system must meet the requirements of § 56.60–10(b) of this chapter.

(b) For purposes of this section, the term ''lethal products'' in § 56.60–10(b)

[3] See also §§ 32.56–5 and 32.60–10 of this chapter for limitations on the stowage of combustible liquids adjacent to ignition sources.

means those cargoes that Table 1 references to § 153.525 or § 153.527.

[CGD 78–128, 47 FR 21207, May 17, 1982]

§ 153.240 Insulation.

Cargo containment system insulation made necessary by the requirements of this part must meet the requirements in § 38.05–20 of this chapter. However, the vapor barrier required by § 38.05–20(b) is unnecessary if the insulation is:

(a) Protected from the weather, and attached to a containment system maintained at a temperature in excess of 46°C (approx. 115°F); or

(b) In an atmosphere whose dewpoint is less than the temperature of any surface in contact with the insulation.

CARGO TANKS

§ 153.250 Double-bottom and deep tanks as cargo tanks.

Except in those cases in which Commandant (G–MSO) specifically approves another arrangement, such as a double-bottom or deep tank as a cargo tank, an integral cargo tank or the hold within which an independent cargo tank is located must extend to the weatherdeck.

[CGD 73–96, 42 FR 49027, Sept. 26, 1977, as amended by CGD 82–063b, 48 FR 4781, Feb. 3, 1983]

§ 153.251 Independent cargo tanks.

All independent cargo tank must meet § 38.05–10 (a)(1), (b), (d), and (e)(1) of this chapter.

[CGD 78–128, 47 FR 21208, May 17, 1982]

§ 153.252 Special requirement for an independent cargo tank.

When Table 1 refers to this section, the cargo tank must be an independent tank that meets §§ 38.05–2(d) and 38.05–4(g) of this chapter. (See also § 153.256(b)).

[CGD 78–128, 47 FR 21208, May 17, 1982]

§ 153.254 Cargo tank access.

(a) A cargo tank must have at least one covered manhole opening into the vapor space described in § 153.354.

(b) An access through a vertical cargo tank surface must be at least 60 cm by 80 cm (approx. 23.6 × 31.5 in.) and no more than 60 cm above a foothold grating, or surface on both sides of the access way.

(c) An access through a horizontal cargo tank surface must be at least 60 cm by 60 cm (approx. 23.6 × 23.6 in.).

(d) An access trunk must be no less than 76 cm (approx. 29.9 in.) in diameter.

§ 153.256 Trunks, domes, and openings of cargo tanks.

(a) The hatch of a cargo tank must:

(1) Be at the highest point of the tank; and

(2) Open on or above the weatherdeck.

(b) To be endorsed to carry a cargo requiring an independent cargo tank, a tank must have:

(1) A trunk or dome at the uppermost part of the tank, extending above the weatherdeck;

(2) Its hatch at the top of the trunk or dome; and

(3) No openings below the weatherdeck.

§ 153.266 Tank linings.

A tank lining must be:

(a) At least as elastic as the tank material; and

(b) Applied or attached to the tank as recommended by the lining manufacturer.

PIPING SYSTEMS AND CARGO HANDLING EQUIPMENT

§ 153.280 Piping system design.

(a) Each cargo piping system must meet the standards of Part 56 and §§ 38.10–1(b), 38.10–1(e), and 38.10–10(a) of this chapter.

(b) Piping carrying cargo or cargo residue may not enter any machinery space except a cargo pumproom.

§ 153.281 Piping to independent tanks.

Piping for an independent cargo tank must penetrate the tank only through that part of the tank or dome extending above the weatherdeck.

[CGD 78–128, 47 FR 21208, May 17, 1982]

§ 153.282 Cargo filling lines.

The discharge point of a cargo tank filling line must be no higher above the bottom of the cargo tank or sump than

10 cm (approx. 4 in.) or the radius of the filling line, whichever is greater.

§ 153.283 Valving for cargo piping.

(a) Except as described in this section, a cargo line must have a deck operable, manual stop valve:

(1) In each tank which the line serves; and

(2) At each cargo hose connection point.

(b) The valve required by paragraph (a)(1) of this section may be in a cargo pumproom at the pumproom bulkhead if the cargo tank the cargo line serves is adjacent to the pumproom.

(c) The valve required by paragraph (a)(1) of this section may be on the weatherdeck if:

(1) The weatherdeck is the top of the tank;

(2) The line goes through the weatherdeck into the tank; and

(3) The valve is at the point where the line penetrates the weatherdeck.

(d) The valve required by paragraph (a)(1) of this section may be outside the tank if:

(1) The tank is an independent tank; and

(2) The valve is at the point where the line penetrates the tank.

(e) The discharge line of an intank cargo pump need not have the valve required by paragraph (a)(1) of this section.

(f) If the cargo exerts a gravity head pressure on a valve required by this section, the valve must be a positive shutoff valve that meets § 56.50–60(d) of this chapter.

[CGD 73–96, 42 FR 49027, Sept. 26, 1977, as amended by CGD 78–128, 47 FR 21208, May 17, 1982]

§ 153.284 Characteristics of required quick closing valves.

A remotely actuated quick closing shutoff valve required by § 153.530(n) must:

(a) Be a positive shutoff valve;

(b) Be of the fail-closed type that closes on loss of power;

(c) Be capable of local manual closing;

(d) Close from the time of actuation in 30 seconds or less; and

(e) Be equipped with a fusible element that melts at less than 104° C. (approx. 220°F.) and closes the valve.

[CGD 78–128, 47 FR 21208, May 17, 1982; 47 FR 27293, June 24, 1982]

§ 153.285 Valving for cargo pump manifolds.

(a) When cargo lines serving different tanks enter a pumproom and connect to the same pump:

(1) Each cargo line must have a stop valve within the line;

(2) The valve must be before the cargo line joins the other lines or pump; and

(3) The valve must be within the pumproom.

(b) The valve in paragraph (a) of this section is required in addition to any valve required under § 153.283(b).

§ 153.292 Separation of piping systems.

Cargo piping systems must be arranged so that operations necessary to provide separate systems can be accomplished in a cargo handling space or on the weatherdeck.

[CGD 78–128, 47 FR 21208, May 17, 1982]

§ 153.294 Marking of piping systems.

(a) Each cargo piping system must be marked with the designation number of the cargo tank it serves at each hose connection, valve, and blind in the piping system. The markings must be in characters at least 5 cm (approx. 2 in.) high.

(b) Every hose connection of a cargo piping system must be marked with the cargo piping system's working pressure required by § 38.10–10(a) of this chapter.[4]

§ 153.296 Emergency shutdown stations.

(a) Each tankship must have at least two emergency shutdown stations.

(b) One emergency shutdown station must be located forward of the deckhouse, in the after part of the weatherdeck in which the cargo tanks are located.

(c) A second emergency shutdown station must be located so that one of the two stations is accessible from any

[4] See § 153.280 of the part.

part of the weatherdeck if a break in a cargo piping system or hose causes spraying or leaking.

(d) Each emergency shutdown station must contain a single remote actuator for all quick closing shutoff valves required by this part.

(e) Each emergency shutdown station must have the controls necessary to stop all cargo pumps on the tankship.

(f) Any remote emergency actuator, such as that for a quick closing shutoff valve, a cargo pump, or a water spray system, must be of a type that will not defeat the operation of other remote emergency actuators. The emergency action must occur whether one or several actuators are operated.

(g) Each emergency shutdown station must be marked as described in §153.955 (c), (d), and (e) with the legend ''EMERGENCY SHUTDOWN STATION'' so that the legend is visible from work areas in the part of the deck where the cargo containment systems are located.

[CGD 73–96, 42 FR 49027, Sept. 26, 1977, as amended by CGD 78–128, 47 FR 21208, May 17, 1982]

§153.297 Emergency actuators at the point of cargo control.

(a) The point from which cargo transfer is controlled must have the same actuators an emergency shutdown station must have under §153.296 and an actuator for any deck water spray systems required by this part.

(b) The point from which cargo transfer is controlled may be one of the emergency shutdown stations required under §153.296 if it meets the requirements of that section.

CARGO HANDLING SPACE VENTILATION

§153.310 Ventilation system type.

A cargo handling space must have a permanent forced ventilation system of the exhaust type.

§153.312 Ventilation system standards.

A cargo handling space ventilation system must meet the following:

(a) A ventilation system exhaust duct must discharge no less than 10 m (approx. 32.8 ft) from openings into or ventilation intakes for, accommodation or service spaces.

(b) A ventilation system must not recycle vapors from ventilation discharges.

(c) Except for the space served by the ventilation duct, a ventilation duct must not pass through a machinery room, an accommodation space, or working spaces.

(d) A ventilation system must be operable from outside the space it ventilates.

(e) A ventilation system must be sized to change the air in the ventilated space at least 30 times per hour.

(f) A ventilation system must not allow air to stagnate in any part of a ventilated space.

(g) A ventilation system must be able to exhaust air from both above and below the deck plates of a ventilated space.

§153.314 Ventilation of spaces not usually occupied.

(a) Each tankship must have portable ventilation equipment that fits the mount required in paragraph (b)(1) of this section.

(b) Each enclosed space within the cargo area that does not have a permanent ventilation system meeting §153.312 must have:

(1) A mount for the portable mechanical ventilation equipment required by this section; and

(2) Either permanent ventilation ductwork connected to the mount and arranged to supply air to the extremities of the space; or

(3) An attachment for temporary ductwork at the mount with enough ductway in the ventilated space and temporary ductwork stowed aboard the vessel to supply air to the extremities of the space.

[CGD 73–96, 42 FR 49027, Sept. 26, 1977, as amended by CGD 78–128, 47 FR 21208, May 17, 1982]

§153.316 Special cargo pumproom ventilation rate.

When Table 1 refers to this section, the cargo pumproom ventilation system must change the air in the cargo pumproom 45 times per hour and discharge no less than 4 m (approx. 13.1 ft) above the deck.

CARGO PUMPROOMS

§ 153.330 Access.

(a) The access door to a cargo pumproom must open on the weatheredeck.

(b) The access way to a cargo pumproom and its valving must allow passage of a man wearing the breathing apparatus required by § 153.214(b)(1).

(c) Each ladderway in a cargo pumproom must be free from obstructions by piping, framework, or other equipment.

(d) Cargo pumproom ladders and platforms must have guard railings.

(e) Each ladder to a cargo pump-room must have an incline from the horizontal of less than 60°.

§ 153.332 Hoisting arrangement.

(a) A cargo pumproom located below the weatherdeck must have a permanent hoisting arrangement with a lifting capacity of 2500 N (approx. 562 lbs), operable from the weatherdeck, for the removal of an unconscious person.

(b) The cargo pumproom must have a 60 cm by 60 cm (approx. 2 ft by 2 ft) cross-sectional clearance through the hoistway.

§ 153.333 Cargo pump discharge pressure gauge.

Each cargo pump within a pumproom must have a discharge pressure gauge outside the pumproom.

§ 153.334 Bilge pumping systems.

(a) A cargo pumproom must have a bilge pumping system.

(b) The bilge pumping system must have:

(1) Complete remote operating controls outside the cargo pumproom; and

(2) An alarm that operates when the depth of liquid in the bilges exceeds 50 cm (approx. 19.7 in.).

§ 153.336 Special cargo pump or pumproom requirements.

(a) When Table 1 refers to this section:

(1) The cargo pump must be an intank cargo pump;

(2) The cargo pumproom must be on or above the weatherdeck; or

(3) The cargo pumproom must have the specific approval of the Commandant (G–MSO).

(b) For a cargo pumproom described in paragraph (a)(2) or (a)(3) the tankship must:

(1) Have a low pressure breathing quality air supply system for use with the breathing apparatus in the pumproom; or

(2) Meet any requirements specified by the Commandant (G–MSO).

(c) A low pressure air supply system described in paragraph (b)(1) of this section must:

(1) Run from fixed air bottles to the pumproom;

(2) Have an air compressor to recharge the fixed air bottles;

(3) have hose connections in the pumproom suitable for use with the breathing apparatus required in § 153.214(b)(1); and

(4) have the air capacity to enable two men to work in the pumproom for at least one hour each without using the cartridges for the breathing apparatus required in § 153.214(b)(1).

[CGD 78–128, 47 FR 21208, May 17, 1982, as amended by CGD 82–063b, 48 FR 4781, Feb. 3, 1983]

CARGO VENTING SYSTEMS

§ 153.350 Location of B/3 vent discharges.

Except as prescribed in § 153.353, a B/3 venting system must discharge:

(a) At the highest of the following points:

(1) 6m (approx. 19.7 ft) above the weatherdeck.

(2) B/3 above the weatherdeck.

(3) 6m (approx. 19.7 ft) above a walkway, if the walkway is within a 6m (approx. 19.7 ft) horizontal radius from the vent discharge.

(b) At least 15m (approx. 49.2 ft) from air intakes for, or openings into, accommodation and service spaces.

[CGD 78–128, 47 FR 21208, May 17, 1982; 47 FR 27293, June 24, 1982]

§ 153.351 Location of 4m vent discharges.

Except as prescribed in § 153.353, a 4m venting system must discharge:

(a) At least 4m (approx. 13.1 ft) above the higher of:

(1) the weatherdeck; or

(2) any walkway that is within a 4m (approx. 13.1 ft) horizontal radius from the vent discharge.

(b) At least 10m (approx. 32.8 ft) from air intakes for, or openings into, accommodation or service spaces.

[CGD 78–128, 47 FR 21208, May 17, 1982]

§ 153.352 B/3 and 4 m venting system outlets.

A B/3 or 4 m venting system outlet must:

(a) Discharge vertically upwards; and

(b) Prevent precipitation from entering the vent system.

§ 153.353 High velocity vents.

The discharge point of a B/3 or 4m venting system must be located at least 3m (approx. 10 ft) above the weatherdeck or walkway if:

(a) The discharge is a vertical, unimpeded jet;

(b) The jet has a minimum exit velocity of 30 m/sec (approx. 98.4 ft/sec); and

(c) The high velocity vent has been approved by Commandant (G–MSO).

[CGD 78–128, 47 FR 21208, May 17, 1982, as amended by CGD 82–063b, 48 FR 4782, Feb. 3, 1983]

§ 153.354 Venting system inlet.

A venting system must terminate in the vapor space above the cargo when the tank is filled to a 2 percent ullage and the tankship has no heel or trim.

§ 153.355 PV venting systems.

When Table 1 requires a PV venting system, the cargo tank must have a PV valve in its vent line. The PV valve must be located between the tank and any connection to another tank's vent line (such as a vent riser common to two or more tanks).

§ 153.358 Venting system flow capacity.

(a) The cross-sectional flow area of any vent system segment, including any PV or SR valve, must at no point be less than that of a pipe whose inside diameter is 6.4 cm (approx. 2.5 in.).

(b) When Table 1 requires a closed or restricted gauging system, calculations must show that, under conditions in which a saturated cargo vapor is discharged through the venting system at the maximum anticipated loading rate, the pressure differential between the cargo tank vapor space and the atmosphere does not exceed 28 kPa gauge (approx. 4 psig), or, for independent tanks, the maximum working pressure of the tank.

§ 153.360 Venting system restriction.

A venting system must have no assembly that could reduce its cross-sectional flow area or flow capacity to less than that required in § 153.358.

§ 153.361 Arrangements for removal of valves from venting systems having multiple relief valves.

A venting system having multiple relief valves may be arranged to allow the removal of a valve (for repair, as an example) provided the venting system:

(a) Has valves that are interlocked, so that the removal of a valve does not reduce the venting system relieving capacity below the minimum relieving capacity required by § 153.358; and

(b) Is arranged so that cargo vapor will not escape through the opening left after a valve has been removed.

[CGD 78–128, 47 FR 21208, May 17, 1982; 47 FR 27293, June 24, 1982]

§ 153.362 Venting system drain.

Unless a cargo vent system at every point is level or slopes back to the cargo tank under all conditions of heel and trim allowed under § 153.806, the cargo vent system must have a drain valve at each low point (trap) in the vent line.

§ 153.364 Venting system supports.

Supports for a vent system must meet § 38.10–10(c) of this chapter.

§ 153.365 Liquid overpressurization protection.

(a) Except as noted in paragraph (b) of this section, a containment system requiring closed or restricted gauging must:

(1) Be designed to withstand the maximum pressure that develops during an overfill of the densest cargo endorsed for the containment system; or

(2) Have an overflow control system that meets § 153.408; or

(3) Meet the requirements specified by the Commandant (G–MSO).

(b) A containment system requiring restricted gauging, except for those cargoes that reference §§ 153.525 or 153.527, may be equipped with a spill valve that:

(1) Meets ASTM F–1271; and

(2) Limits the maximum pressure during liquid overfill at a specified cargo loading rate to that which the containment system is able to withstand (see §§ 153.294(b) and 152.977(b)).

[CGD 78–128, 47 FR 21208, May 17, 1982, as amended by CGD 82–063b, 48 FR 4782, Feb. 3, 1983; CGD 88–032, 56 FR 35827, July 29, 1991]

§ 153.368 Pressure-vacuum valves.

(a) The pressure side of a required pressure-vacuum relief valve must begin to open only at a pressure exceeding 3.5 kPa gauge (approx. 0.5 psig).

(b) A pressure-vacuum relief valve must meet the requirements of Subpart 162.017 of this chapter.

§ 153.370 Minimum relief valve setting for ambient temperature cargo tanks.

The relief valve setting for a containment system that carries a cargo at ambient temperature must at least equal the cargo's vapor pressure at 46 ° C (approx. 115 ° F).

[CGD 81–078, 50 FR 21173, May 22, 1985]

§ 153.371 Minimum relief valve setting for refrigerated cargo tanks.

The relief valve setting for a containment system that carries a refrigerated cargo must at least equal the lesser of:

(a) That in § 153.370; or

(b) 110 percent of the cargo's vapor pressure at the steady state temperature obtained by a full tank of cargo with the refrigeration system operating under ambient conditions described within the definition of a refrigerated tank in § 153.2.

§ 153.372 Gauges and vapor return for cargo vapor pressures exceeding 100 kPa (approx. 14.7 psia).

When table 1 references this section, the containment system must have a:

(a) Tank pressure gauge at the point where cargo flow is controlled during transfer; and

(b) Vapor return connection.

[CGD 73–96, 42 FR 49027, Sept. 26, 1977; 42 FR 57126, Nov. 1, 1977, as amended by CGD 81–078, 50 FR 21173, May 22, 1985]

CARGO GAUGING SYSTEMS

§ 153.400 General requirements for gauges.

(a) Columnar gauge glasses must not be installed on a cargo containment system.

(b) Flat sight glasses must meet § 38.10–20(h) of this chapter.

§ 153.404 Standards for containment systems having required closed gauges.

When Table 1 requires a cargo's containment system to have a closed gauge, the containment system must have the following:

(a) A permanently installed closed gauging system.

(b) A vapor return connection.

(c) The high level alarm described in § 153.409.

(d) Either a closed cargo sampling system or a cargo sampling arrangement allowing the retrieval of a sample through an orifice not exceeding:

(1) 0.635 cm (approx. 0.25 in.) diameter when the cargo's vapor pressure is 28 kPa gauge (approx. 4 psig) or less; or

(2) 0.140 cm (approx. 0.055 in.) diameter when the cargo's vapor pressure exceeds 28 kPa (approx. 4 psig).

§ 153.406 Standards for containment systems having required restricted gauges.

When Table 1 requires a cargo's containment system to have a restricted gauge, the containment system must have:

(a) A closed gauging system; or

(b) A system that has:

(1) A restricted gauge (e.g., a sounding tube) with an orifice diameter not exceeding 20 cm (approx. 7.8 in.);

(2) A permanently attached gauge cover that is vapor tight when in place; and

(3) A venting system that has either:

(i) Lock open PV valves; or

(ii) Valved bypasses around the PV valves.

§ 153.407 Special requirements for sounding tube gauges.

(a) A sounding tube installed as a restricted gauge must extend to within one meter (approx. 39.4 in.) of the bottom of the tank.

(b) A sounding tube must not be installed on a tank whose relief valve setting exceeds 28 kPa (approx. 4 psig) unless it is specifically permitted by the Commandant (G–MSO).

(c) A sounding tube must have no perforations in the tube wall.

[CGD 73–96, 42 FR 49027, Sept. 26, 1977, as amended by CGD 82–063b, 48 FR 4782, Feb. 3, 1983]

§ 153.408 Tank overflow control.

(a) When table 1 references this section, a cargo containment system must have a cargo high level alarm meeting § 153.409 and one of the following additional systems:

(1) A second high level (cargo overflow) alarm.

(2) A system that automatically stops cargo flow to the tank (automatic shutdown system).

(b) The high level alarm and the cargo overflow alarm or automatic shutdown system must:

(1) Be independent of one-another; and

(2) Operate on loss of power.

(c) The cargo overflow alarm or the automatic shutdown system must operate early enough to:

(1) Stop the loading operation before the cargo tank overflows; and

(2) Avoid surge pressures that exceed the working pressure specified in § 153.294(b).

(d) A tank overflow must be identified with the legend ''TANK OVERFLOW ALARM'' in lettering as specified for the warning sign in § 153.955.

(e) A tank overflow alarm must be audible and visible in that part of the deck where the containment systems are located and at the point where cargo loading is controlled on the tankship.

(f) The automatic shutdown system or tank overflow alarm must be able to be checked at the tank for proper operation (for example, by electrically simulating an overfill at the tank gauge connection).

(g) In this section, ''independent'' as applied to two systems means that one system will operate with a failure of any part of the other system except high level power sources and electrical feeder panels. Conduit need not be independent; the control wiring for several independent systems may be carried in a single conduit.

[CGD 81–078, 50 FR 21173, May 22, 1985]

§ 153.409 High level alarms.

When Table 1 refers to this section or requires a cargo to have a closed gauging system, the cargo's containment system must have a high level alarm:

(a) That gives an audible and visual alarm before the tank fills to 97 percent of its capacity;

(b) That can be seen and heard where cargo transfer is controlled and on the open deck;

(c) Whose operation can be checked prior to each loading; and

(d) That must be marked as described in § 153.408(c)(6) with the legend ''HIGH LEVEL ALARM.''

[CGD 78–128, 47 FR 21209, May 17, 1982; 47 FR 27293, June 24, 1982]

CARGO TEMPERATURE CONTROL SYSTEMS

§ 153.430 Heat transfer systems; general.

Each cargo cooling system required by this part and each cargo heating system must:

(a) Meet the standards of Subchapters F (Marine Engineering) and J (Electrical Engineering) of this chapter;

(b) Have valving that enables the system to be separated from all other cooling and heating systems; and

(c) Allow manual regulation of the system's heat transfer rate.

[CGD 73–96, 42 FR 49027, Sept. 26, 1977, as amended by CGD 78–128, 47 FR 21209, May 17, 1982; CGD 81–078, 50 FR 21174, May 22, 1985]

§ 153.432 Cooling systems.

(a) Each cargo cooling system must have an equivalent standby unit that is installed and that can be placed in operation immediately after failure of the primary cooling system.

(b) Each tankship that has a cargo tank with a required cooling system must have a manual that contains:

(1) A piping diagram for the cooling system; and

(2) Instructions for changing over to the standby system described in paragraph (a) of this section.

[CGD 73–96, 42 FR 49027, Sept. 26, 1977, as amended by CGD 78–128, 47 FR 21209, May 17, 1982]

§ 153.434 Heat transfer coils within a tank.

When a cargo tank contains any quantity of cargo, a cargo cooling or heating system having coils within the tank must keep the heat transfer fluid at a pressure greater than the pressure exerted on the heating or cooling system by the cargo.

[CGD 78–128, 47 FR 21209, May 17, 1982]

§ 153.436 Heat transfer fluids: compatibility with cargo.

A heat transfer fluid separated from the cargo by only one wall (for example, the heat transfer fluid in a coil within a tank) must be compatible with the cargo under the standards prescribed for compatibility between two cargoes in Part 150 of this chapter.

[CGD 81–078, 50 FR 21174, May 22, 1985]

§ 153.438 Cargo pressure or temperature alarms required.

(a) Each refrigerated tank must have:

(1) An alarm that operates when the cargo's pressure exceeds the vapor pressure described in § 153.371(b); or

(2) An alarm that operates when the cargo's temperature exceeds the steady state temperature described in § 153.371(b).

(b) The alarm must give an audible and visual signal on the bridge and at the cargo control station.

(c) The cargo pressure or temperature alarm must be independent of other cargo pressure or temperature sensing arrangements.

§ 153.440 Cargo temperature sensors.

(a) Except as prescribed in paragraph (c) of this section, when Table 1 refers to this section, the containment system must meet the following requirements:

(1) A heated or refrigerated cargo tank must have a remote reading thermometer sensing the temperature of the cargo at the bottom of the tank.

(2) A refrigerated tank must have a remote reading second thermometer near the top of the tank and below the maximum liquid level allowed by § 153.981.

(3) Unless waived under § 153.491(a), a cargo tank endorsed to carry a Category A, B, or C NLS cargo must have a thermometer whose temperature reading is no greater than the temperature of the cargo at a level above the tank bottom at least one-eighth but no more than one-half the height of the tank if the cargo is—

(i) A Category A NLS or a Category B NLS having a viscosity of at least 25 mPa.s at 20 °C;

(ii) A Category C NLS having a viscosity of at least 60 mPa.s at 20 °C; or

(iii) A Category A, B, or C NLS that has a melting point greater than 0 °C.

(b) A readout for each remote thermometer required by this section must be at the point where cargo transfer is controlled.

(c) A portable thermometer may be substituted for the equipment required in paragraphs (a) and (b) of this section if—

(1) Table 1 allows open gauging with the cargo; or

(2) Table 1 allows restricted gauging with the cargo, and the portable thermometer is designed to be used through the containment system's restricted gauging system.

[CGD 78–128, 47 FR 21209, May 17, 1982, as amended by CGD 81–101, 52 FR 7781, Mar. 12, 1987; CGD 81–101, 53 FR 28974, Aug. 1, 1988 and 54 FR 12629, Mar. 28, 1989]

Special Requirements for Flammable or Combustible Cargoes

§ 153.460 Fire protection systems.

Each self-propelled ship and each manned non-self-propelled ship must meet the following:

(a) With the exception of the vent riser, each part of a cargo containment system exposed on the weatherdeck must be covered by the fire protection system listed beside the cargo in Table 1 and described in the footnotes to Table 1.

(b) The Commandant (G–MSO) approves the substitution of a dry chemical (D) type fire protection system for an A or B type on a case by case basis.

(c) A fire protection system required by this part must meet part 34 of this chapter or be specifically approved by the Commandant (G–MSO).

[CGD 73–96, 42 FR 49027, Sept. 26, 1977, as amended by CGD 82–063b, 48 FR 4782, Feb. 3, 1983; CGD 81–101, 52 FR 7781, Mar. 12, 1987]

§ 153.461 Electrical bonding of independent tanks.

An independent metallic cargo tank that carries a flammable or combustible cargo must be electrically bonded to the tankship's hull.

§ 153.462 Static discharges from inert gas systems.

An inert gas system on a tank that carries a flammable or combustible cargo must not create static arcing as the inert gas is injected into the tank.

§ 153.463 Vent system discharges.

The discharge of a venting system must be at least 10 m (approx. 32.8 ft) from an ignition source if:

(a) The cargo tank is endorsed to carry a flammable or combustible cargo; and

(b) Table 1 requires the cargo to have a PV venting system.

§ 153.465 Flammable vapor detector.

(a) A tankship that carries a flammable cargo must have two vapor detectors that meet §35.30–15(b) of this chapter.

(b) At least one of the vapor detectors in paragraph (a) of this section must be portable.

§ 153.466 Electrical equipment.

A tankship carrying a flammable or combustible cargo under this part must meet subchapter J of this chapter.

DESIGN AND EQUIPMENT FOR POLLUTION CONTROL

SOURCE: Sections 153.470 through 153.491 appear at CGD 81–101, 52 FR 7781, Mar. 12, 1987, unless otherwise noted.

§ 153.470 System for discharge of NLS residue to the sea: Categories A, B, C, and D.

Unless waived under §153.491, each ship that discharges Category A, B, or C NLS residue, or Category D NLS residue not diluted to 1/10th of its original concentration, into the sea under §§153.1126 and 153.1128 must have an NLS residue discharge system meeting the following:

(a) *Minimum diameter of an NLS residue discharge outlet.* The outlet of each NLS residue discharge system must have a diameter at least as great as that given by the following formula:

$$D = \frac{(Q_d)(\text{cosine } \phi)}{5L}$$

Where:

D=Minimum diameter of the discharge outlet in meters.

Q_d=Maximum rate in cubic meters per hour at which the ship operator wishes to discharge slops (note: Q_d affects the discharge rate allowed under §153.1126(b)(2)).

L=Distance from the forward perpendicular to the discharge outlet in meters.

ϕ=The acute angle between a perpendicular to the shell plating at the discharge location and the direction of the average velocity of the discharged liquid.

(b) *Location of an NLS residue discharge outlet.* Each NLS residue discharge outlet must be located—

(1) At the turn of the bilge beneath the cargo area; and

(2) Where the discharge from the outlet is not drawn into the ship's seawater intakes.

(c) *Location of dual NLS residue discharge outlets.* If the value of 6.45 for K is used in §153.1126(b)(2), the NLS residue discharge system must have two outlets located on opposite sides of the ship.

NOTE: A ship built before July 1, 1986 does not need a residue discharge system to discharge to the sea under §153.1128 until January 1, 1988.

[CGD 81–101, 52 FR 7781, Mar. 12, 1987, as amended by CGD 81–101, 53 FR 28974, Aug. 1, 1988 and 54 FR 12629, Mar. 28, 1989]

EFFECTIVE DATE NOTE: At 62 FR 51209, Sept. 30, 1997, §153.470 was amended by CGD 95–028 by removing the note at the end of the section, effective Oct. 30, 1997.

§153.480 Stripping quantity for Category B and C NLS tanks on ships built after June 30, 1986: Categories B and C.

Unless waived under §153.491, Category B and C NLS cargo tanks on each ship built after June 30, 1986 must have stripping quantities determined under §153.1604 that are less than—

(a) 0.15 m^3 if Category B; and
(b) 0.35 m^3 if Category C.

§153.481 Stripping quantities and interim standards for Category B NLS tanks on ships built before July 1, 1986: Category B.

Unless waived under §153.483 or §153.491, each Category B NLS cargo tank on ships built before July 1, 1986 must meet the following:

(a) Unless the tank meets the interim standard provided by paragraph (b) of this section and is prewashed in accordance with §153.1118, the tank must have a stripping quantity determined under §153.1604 that is less than 0.35m^3.

(b) Before October 3, 1994, the tank may have a total NLS residue determined under §153.1608 that is less than 1.0 m^3 or 1/3000th of the tank's capacity and an NLS residue discharge system meeting the following:

(1) The system must be capable of discharging at a rate equal to or less than Q in the following formula:

$$Q=K\,U^{1.4}\,L^{1.6}\times10^{-5}\ m^3/hr$$

where:

K=4.3, except K=6.45 if the discharge is equally distributed between two NLS residue discharge outlets on opposite sides of the ship (see §§153.470(c) and 153.1126(b)).
L=ship's length in meters.
U=for a ship that is self-propelled, the minimum speed in knots specified in the approved Procedures and Arrangements Manual for discharging Category B NLS residue, but at least 7;
U=for a ship that is not self-propelled, the minimum speed in knots specified in the approved Procedures and Arrangements Manual for discharging Category B NLS residue, but at least 4.

(2) The system must have equipment capable of automatically recording—

(i) The time of day that discharge of NLS residue through the residue discharge system starts and ends; and

(ii) The dates on which discharge begins and ends unless the equipment allows a person to enter these dates on the record manually.

(3) Each system that has the capacity to exceed Q calculated in paragraph (b)(1) of this section must have equipment that—

(i) Records the NLS residue flow through the system; and

(ii) Is sufficiently accurate that its recorded values averaged over any 30 second period differ no more than 15% from the actual flow averaged over the same 30 second period.

(4) Each system that has the capacity to exceed Q calculated under paragraph (b)(1) of this section and does not automatically control the flow rate must have—

(i) Manual controls that enable the flow to be adjusted to the value of Q calculated in paragraph (b)(1) of this section and that must be moved through at least 25% of their total range of movement for the discharge rate to change from 0.5Q to 1.5Q; and

(ii) A flow rate meter located where the flow is manually controlled.

[CGD 81–101, 52 FR 7781, Mar. 12, 1987, as amended by CGD 81–101, 53 FR 28974, Aug. 1, 1988 and 54 FR 12629, Mar. 28, 1989]

§153.482 Stripping quantities and interim standards for Category C NLS tanks on ships built before July 1, 1986: Category C.

Unless waived under §153.483 or §153.491, each Category C NLS cargo tank on ships built before July 1, 1986 must meet the following:

(a) Unless the tank meets the interim standard provided by paragraph (b) of this section, the tank must have a stripping quantity determined under 153.1604 that is less than 0.95 m^3.

(b) Before October 3, 1994, the tank may have a total NLS residue determined under §153.1608 that is less than 3.0 m^3 or 1/1000th of the tank's capacity.

§153.483 Restricted voyage waiver for Category B and C NLS tanks on ships built before July 1, 1986: Category B and C.

At its discretion the Coast Guard waives §§153.481 and 153.482 under this section and allows a ship to carry Category B and C NLS cargoes between ports or terminals in one or more countries signatory to MARPOL 73/78 if the

ship's owner requests a waiver following the procedures in § 153.10 and includes—

(a) A written pledge to—

(1) Limit the loading and discharge of Category B and C NLS cargoes in a foreign port to those ports and terminals in countries signatory to MARPOL 73/78 and listed in accordance with paragraph (b) of this section; and

(2) Prewash the cargo tank as required under § 153.1118 after each Category B or C NLS is unloaded unless the prewash is allowed to be omitted under § 153.1114;

(b) A list of—

(1) All foreign ports or terminals at which the ship is expected to load or discharge Category B or C NLS cargo, and

(2) All foreign ports or terminals at which the ship is expected to discharge Category B or C NLS residue from the tank;

(c) An estimate of the quantity of NLS residue to be discharged to each foreign port or terminal listed under paragraph (b)(2) of this section;

(d) Written statements from the owners of adequate reception facilities in the ports and terminals listed in accordance with paragraph (b)(2) of this section who have agreed to take NLS residue from the ship, showing the amount of NLS residue each agrees to take; and

(e) A written attestation from the person in charge of each port or terminal listed in accordance with paragraph (b)(1) of this section that the administration has determined the port or terminal to have adequate reception facilities for the NLS residue.

NOTE TO § 153.483: Certificates of Inspection and any IMO Certificates issued to ships on restricted voyage waivers indicate that while the ship carries an NLS cargo or NLS residue, it is limited to voyages between the ports or terminals listed on the certificate.

[CGD 81–101, 52 FR 7781, Mar. 12, 1987, as amended by CGD 81–101, 53 FR 28975, Aug. 1, 1988 and 54 FR 12629, Mar. 28, 1989]

§ 153.484 Prewash equipment.

Unless the ship operator shows that the prewash equipment specified in this section will be available at discharge or prewash facilities or the equipment is waived under § 153.491, to have its Certificate of Inspection or Certificate of Compliance endorsed to carry a Category A NLS or a Category B or C NLS requiring viscosity or melting point information under § 153.908 (a) and (b), a ship must have the following:

(a) For the tanks that carry the NLS, a tank washing system capable of washing all interior tank surfaces except those shielded from the washing system spray by ship's structure, and consisting of a wash water supply system and—

(1) A fixed tank washing machine in each tank; or

(2) A portable tank washing machine and, if required by the Coast Guard, equipment to move it during washing and when storing.

(b) Piping, valving, and crossovers needed to arrange the cargo piping so that the wash water passes through the cargo pump and cargo piping during tank washing or discharge of tank wash water.

(c) If the approved Procedures and Arrangements Manual specifies the hot water prewash required under 153.1108, a means of supplying water to the tank washing machine under paragraph (a) of this section at—

(1) A temperature of at least 60 °C (140 °F) when it leaves the washing machine; and

(2) The flow rate needed for the washing machine jets to meet paragraph (a) of this section.

§ 153.486 Design and equipment for removing NLS residue by ventilation: Categories A, B, C, and D.

(a) If NLS residue is to be removed from a cargo tank by ventilation, in addition to the equipment required under paragraph (b) of this section the ship must have—

(1) Openings in the tank deck near the sump or suction point;

(2) If the openings required by paragraph (a)(1) of this section are insufficient, an access opening for visually determining whether liquid remains in the sump area of the cargo tank after ventilation or some other means for making this determination; and

(3) An approved Procedures and Arrangements Manual with instructions that meet § 153.490(b)(3).

(b) Unless the ship operator shows that the ventilation equipment specified in this paragraph will be available from shore when needed, if NLS residue is to be removed from a cargo tank by ventilation, in addition to the equipment required under paragraph (a) of this section the ship must have—

(1) Portable forced air ventilating equipment fitting the ventilation openings required in paragraph (a) of this section and able to ventilate the extremities of the tank to the extent prescribed in Appendix C of the IMO *Standards for Procedures and Arrangements for the Discharge of Noxious Liquid Substances,* Resolution MEPC 18(22), 1985; and

(2) A connector that allows a fan or air supply to be connected to the hose connections for the tank at the manifold.

NOTE: The Clean Air Act (42 U.S.C. 7401 *et seq.*) allows states to regulate emissions from tank ventilation. There may be other regulations, both local and Federal, that affect the use of tank ventilation for safety or environmental purposes.

§ 153.488 Design and equipment for tanks carrying high melting point NLSs: Category B.

Unless waived under § 153.491, for a ship to have its Certificate of Inspection or Certificate of Compliance endorsed allowing a tank to carry a Category B NLS with a melting point of 15 °C or more, the cargo tank must have—

(a) An arrangement enabling the cargo to be heated before cargo transfer, using heat supplied by the ship or by another source; and

(b) Sides and bottom separate from the ship's side or bottom shell plating.

§ 153.490 Cargo Record Book and Approved Procedures and Arrangements Manual: Categories A, B, C, and D.

(a) Unless waived under § 153.491, to have a Certificate of Inspection or Certificate of Compliance endorsed to carry NLS cargo, a ship must have—

(1) If U.S., a Cargo Record Book published by the Coast Guard (OMB App. No. 2115–0089), or, if foreign, a Cargo Record Book having the same entries and format as Appendix 4 of Annex II; and

(2) A Procedures and Arrangements Manual meeting paragraph (b) of this section and approved by—

(i) The Coast Guard, if the ship is a United States ship or one whose Administration is not signatory to MARPOL 73/78; or

(ii) The Administration, if the ship is one whose Administration is signatory to MARPOL 73/78.

(b) Each Procedures and Arrangements Manual under paragraph (a)(2) of this section must include the following:

(1) The standard format and content prescribed in Chapter 2 and Appendix D of the IMO *Standards for Procedures and Arrangements for the Discharge of Noxious Liquid Substances,* Resolution MEPC 18(22), 1985, or, for ships for which the only NLS carried is a Category D NLS and ships having a waiver under § 153.483 or § 153.491, the format and content prescribed by the Commandant (G–MSO).

(2) If the ship has a tank that carries a cargo under a waiver issued under § 153.483, procedures ensuring that—

(i) Category B and C NLSs are discharged from the tank only in the ports or terminals listed in accordance with § 153.483(b); and

(ii) The tank is prewashed after discharging each Category B or C NLS unless § 153.1114 allows the prewash to be omitted.

(3) If ventilation is used to clean a tank under § 153.1102(b)(2), ventilation procedures that meet those in Appendix C of the IMO *Standards for Procedures and Arrangements for the Discharge of Noxious Liquid Substances,* Resolution MEPC 18(22), 1985.

(4) If tank cleaning agents are used, quantities to use and instructions for using the cleaning agents.

(5) If the tank has the discharge recording equipment required in § 153.481(b), procedures to ensure that no NLS residue is discharged from the tank when the recording equipment is incapacitated unless the concentration and total quantity limits for the NLS in Annex II are not exceeded.

[CGD 81–101, 52 FR 7781, Mar. 12, 1987, as amended by CGD 81–101, 53 FR 28975, Aug. 1, 1988 and 54 FR 12629, Mar. 28, 1989]

§ 153.491 Waiver of certain equipment for dedicated cargo tanks.

(a) The Coast Guard waives §§ 153.440(a)(3), 153.480, 153.481, 153.482, and 153.488 and endorses a ship's Certificate of Inspection or Certificate of Compliance allowing a cargo tank to carry a single, specific NLS cargo and no other cargo if the ship's owner—

(1) Requests a waiver following the procedures in § 153.10; and

(2) Pledges in writing that while any waiver is in effect the cargo tank will—

(i) Carry only the NLS cargo listed on the Certificate of Inspection or Certificate of Compliance;

(ii) Carry no cargo other than the NLS; and

(iii) Not be washed or ballasted unless the wash water or ballast water is discharged to a reception facility.

(b) The Coast Guard waives §§ 153.470 and 153.490(a)(2) if—

(1) The ship's owner requests a waiver following the procedures in § 153.10;

(2) The Coast Guard has issued a waiver to each of the ship's NLS cargo tanks under paragraph (a) of this section; and

(3) The ship's owner adds to the ship's operational manual any provisions for preventing NLS discharge specified by the Commandant (G–MSO) as a condition for issuing the waiver.

[CGD 81–101, 52 FR 7781, Mar. 12, 1987, as amended by CGD 81–101, 53 FR 28975, Aug. 1, 1988 and 54 FR 12629, Mar. 28, 1989]

SPECIAL REQUIREMENTS

§ 153.500 Inert gas systems.

When Table 1 refers to this section, a cargo containment system must have a permanent inert gas system that:

(a) Maintains the vapor space of the containment system in an inert state by filling the vapor space with a gas that is neither reactive with the cargo nor flammable;

(b) Has a pressure control system that:

(1) Prevents the inert gas system from raising the cargo tank pressure to more than the relief valve setting; and

(2) Maintains at least a 3.5 kPa gauge (approx. 0.5 psig) pressure within the containment system at all times, including cargo discharge;

(c) Has storage for enough inerting gas to replace that normally lost while the tank's atmosphere is maintained in an inert condition (e.g. through tank breathing and relief valve leakage), but in no case an amount less than 5 percent of the tank's capacity when measured with the gas at −18°C (approx. 0°F) and a pressure equal to the cargo tank's relief valve setting; and

(d) Has connections for any supplemental gas supply necessary to maintain the inert gas pressure described in paragraph (b) of this section during cargo discharge.

§ 153.501 Requirement for dry inert gas.

When Table 1 refers to this section, an inert gas system for the containment system must supply inert gas containing no more than 100 ppm water.

§ 153.515 Special requirements for extremely flammable cargoes.

When Table 1 refers to this section:

(a) An enclosed space containing a cargo tank must have an inerting system that meets the requirements in § 153.500 applying to the inert gas system of a containment system;

(b) Cargo discharge pumps must be of a type that does not subject the shaft gland to the cargo under pressure or that is submerged; and

(c) The cargo tank's relief valve setting must be no less than 21 kPa gauge (approx. 3 psig).

§ 153.520 Special requirements for carbon disulfide.

A containment system carrying carbon disulfide must meet the following:

(a) Each cargo pump must be of the intank type and encased within a cylindrical well that extends from the top of the tank to a point no more than 10 cm (approx. 4 in.) above the bottom of the tank.

(b) [Reserved]

(c) The cargo piping and venting systems must be completely independent of those for other cargo.

(d) Pressure relief valves must be made of type 304 or 316 stainless steel.

[CGD 73–96, 42 FR 49027, Sept. 26, 1977, as amended by CGD 78–128, 47 FR 21209, May 17, 1982]

§ 153.525 Special requirements for unusually toxic cargoes.

When Table 1 refers to this section a containment system must meet the following:

(a) Cargo piping and venting systems must be designed so that they can be separated from any containment system endorsed for a cargo not covered by this section.

(b) A cargo tank's relief valve setting must be not less than 21 kPa gauge (approx. 3 psig).

(c) All cargo pumps and valves located below the weatherdeck must be operable from the weatherdeck.

(d) A heat transfer system for the cargo must:

(1) Be independent of other ship service systems, except for other cargo heat transfer systems, and not enter the engine room;

(2) Be totally external to the cargo containment system; or

(3) Be approved by the Commandant (G–MSO) for use with toxic cargoes.

(e) The cargo must be separated from any bunkers by at least two bulkheads.

(f) A cargo containment system must have a vapor return connection.

[CGD 73–96, 42 FR 49027, Sept. 26, 1977, as amended by CGD 78–128, 47 FR 21209, May 17, 1982; CGD 82–063b, 48 FR 4782, Feb. 3, 1983]

§ 153.526 Toxic vapor detectors.

(a) When Table 1 refers to this section, a tankship must have two toxic vapor detectors, at least one of which must be portable, each able to measure vapor concentrations in the range of the time weighted average (TWA) for the cargo. The portable detector may be a direct reading detector tube instrument. These vapor detectors may be combined with those required by § 153.465.

(b) When the toxic vapor detectors required by paragraph (a) of this section are not available and the cargo referenced to this section is transferred through a cargo pumproom, the tankship must meet § 153.336(b).

[CGD 78–128, 47 FR 21210, May 17, 1982]

§ 153.527 Toxic vapor protection.

When Table 1 refers to this section, a tankship must have on board for each crew member:

(a) An emergency escape breathing apparatus (EEBA) approved by the Mining Safety and Health Administration (formerly the Mining Enforcement and Safety Administration) and the National Institute for Occupational Safety and Health, or the tankship's flag administration.

(b) Where the emergency escape breathing apparatus does not protect the eyes from vapors, a set of goggles that either:

(1) Meet the specifications of ANSI Practice for Occupational and Educational Eye and Face Protection, Z–87.1(1979); or

(2) Are approved by the tankship's flag administration.

[CGD 78–128, 47 FR 21210, May 17, 1982]

§ 153.530 Special requirements for alkylene oxides.

When Table 1 refers to this section, a containment system must meet the following:

(a) Except as provided in paragraphs (b) and (c) of this section, a cargo containment system must be made of:

(1) Stainless steel other than types 416 and 442; and

(2) Steel.

(b) Except as provided in paragraph (c) of this section, gaskets must be composites of spirally wound stainless steel and Teflon or similar flourinated polymer.

(c) The Commandant (G–MSO) approves a cargo containment system using materials other than those described in this section for alkylene oxides on a case by case basis if:

(1) The person wishing to have the containment system approved completes any tests prescribed by the Commandant (G–MSO); and

(2) The Commandant (G–MSO) approves the results of the tests and the material for use with alkylene oxides.

(d) The following materials are generally found unsatisfactory for gaskets, packing, insulation, and similar uses in alkylene oxide containment systems and would require extensive testing as described in paragraph (c) of this section before being approved:

(1) Neoprene or natural rubber if it might be in contact with the alkylene oxide.

(2) Asbestos or asbestos mixed with other materials such as with many common insulations, packing materials, and gasket materials.

(3) Materials containing oxides of magnesium, such as mineral wools.

(e) The tank's relief valve setting must not be less than 21 kPa gauge (approx. 3 psig).

(f) If the containment system is equipped with a cooling system, the cooling system must:

(1) Not compress the cargo; and

(2) Regulate the cargo temperature automatically and allow manual regulation.

(g) The cargo piping system must:

(1) Comply with Part 38 of this chapter;

(2) Be completely separate from all other systems;

(3) Be assembled from valves, fittings, and accessories having a pressure rating of not less than 1030 kPa gauge (approx. 150 psig) (American National Standards Institute); and

(4) Have no threaded joints.

(h) The cargo containment system vapor space and each space listed in paragraphs (k) and (l) of this section must have continuous monitoring of oxygen concentration or have an arrangement to enable sampling with a portable oxygen analyzer.

(i) Valve disks or disk faces, seats, and other wearing valve parts must be made of stainless steel containing no less than 11 percent chromium.

(j) The venting system must be independent of other containment or tankship systems.

(k) When a cargo tank is in an enclosed space, the space must have:

(1) An inert gas system meeting the requirements that apply to the inert gas system of a containment system in § 153.500, or

(2) A forced ventilation system meeting the requirements that apply to a cargo handling space ventilation system in § 153.312.

(l) Cofferdams, cargo tanks, double bottom spaces, void spaces and other enclosed spaces adjacent to an integral cargo tank must have an inert gas system meeting the requirements that apply to the inert gas system of a containment system in § 153.500.

(m) An intank pump or inert gas displacement must be used to discharge cargo.

(n) The cargo discharge piping system must have a remotely actuated quick closing shutoff valve that meets § 153.284 at the cargo transfer hose connection.

(o) Cargo hose must:

(1) Have the specific approval of the Commandant (G–MSO) for use in alkylene oxide transfer; and

(2) Be marked ''For Alkylene Oxide Transfer Only''.

(p) All exposed parts of the cargo containment system above or on the deck, such as tank domes, cargo piping, and loading manifolds, must be covered by a water spray system that:

(1) Operates automatically in a fire involving the cargo containment system;

(2) Has at least two remote manual actuators, one in each emergency shutdown station required by § 153.296; and

(3) Covers the area of application with a uniform spray of

$$0.175\ l/m^2\ sec\ (0.0043\ gal/ft^2\ sec).$$

[CGD 73–96, 42 FR 49027, Sept. 26, 1977, as amended by CGD 78–128, 47 FR 21210, May 17, 1982; CGD 82–063b, 48 FR 4782, Feb. 3, 1983; CGD 82–063b, 48 FR 39629, Sept. 1, 1983; CGD 81–078, 50 FR 21174, May 22, 1985]

§ 153.545 Special requirements for liquid sulfur.

(a) A containment system carrying liquid sulfur must have:

(1) A cargo tank ventilation system that:

(i) Maintains the H_2S vapor concentration below 1.85 percent by volume; and

(ii) Prevents sulfur buildup within itself; and

(2) An alarm system designed to operate when the ventilation system blower fails.

(b) The void spaces around a cargo tank that carries liquid sulfur must be oil tight.

(c) A cargo tank that carries liquid sulfur and the void spaces surrounding the tank must have connections for sampling vapor.

§ 153.554 Special requirements for acids.

When Table 1 refers to this section:

(a) Each containment system loading and discharge connection must have a spray shield;

(b) Each cargo containment system must be separated from bunkers by double walls, such as a cofferdam and piping tunnels; and

(c) Each vessel must have on board a means to determine whether cargo has leaked into the spaces adjacent to a cargo containment system.

§ 153.555 Special requirements for inorganic acids.

When Table 1 refers to this section, a tankship's shell plating must not be a part of the cargo tank.

[CGD 78–128, 47 FR 21210, May 17, 1982]

§ 153.556 Special requirements for sulfuric acid and oleum.

(a) Except as prescribed in paragraphs (b) and (c) of this section, containment systems carrying sulfuric acid, oleum, or contaminated sulfuric acid are approved by the Commandant (G–MSO) on a case by case basis.

(b) A containment system carrying sulfuric acid may be:

(1) Made of unlined steel if the cargo composition is between 70 and 80 or between 90 and 100 percent acid by weight;

(2) Lined with lead if the cargo composition does not exceed 96 percent acid by weight; or

(3) Lined with natural rubber or neoprene if the cargo composition does not exceed 51 percent acid by weight.

(c) A containment system for oleum may be of unlined steel if the concentration of free sulfur trioxide in the oleum exceeds 20 percent by weight.

[CGD 73–96, 42 FR 49027, Sept. 26, 1977, as amended by CGD 82–063b, 48 FR 4782, Feb. 3, 1983]

§ 153.557 Special requirements for hydrochloric acid.

(a) A containment system that carries hydrochloric acid must be lined with:

(1) Natural rubber;

(2) Neoprene; or

(3) A material approved for hydrochloric acid tanks by the Commandant (G–MSO).

(b) Containment systems for contaminated hydrochloric acid are approved by the Commandant (G–MSO) on a case by case basis.

[CGD 73–96, 42 FR 49027, Sept. 26, 1977, as amended by CGD 82–063b, 48 FR 4781, Feb. 3, 1983]

§ 153.558 Special requirements for phosphoric acid.

A phosphoric acid containment system must be:

(a) Lined with natural rubber or neoprene;

(b) Lined with a material approved for phosphoric acid tanks by the Commandant (G–MSO); or

(c) Made of a stainless steel that resists corrosion by phosphoric acid.

NOTE: ''Phosphoric acid'', as defined in § 153.2, includes phosphoric acid, superphosphoric acid, and aqueous solutions of phosphoric acid.

[CGD 73–96, 42 FR 49027, Sept. 26, 1977, as amended by CGD 82–063b, 48 FR 4782, Feb. 3, 1983; CGD 88–100, 54 FR 40042, Sept. 29, 1989]

§ 153.559 Special requirements for nitric acid (less than 70 percent).

A containment system that carries nitric acid (less than 70 percent) must be of stainless steel that resists corrosion by nitric acid.

§ 153.560 Special requirements for Alkyl (C7–C9) nitrates.

(a) The carriage temperature of octyl nitrates must be maintained below 100°C (212°F) in order to prevent the occurrence of a self-sustaining exothermic decomposition reaction.

(b) Octyl nitrates may not be carried in a deck tank unless the tank has a combination of insulation and a water deluge system sufficient to maintain the tank's cargo temperature below 100°C (212°F) and the cargo temperature rise at below 1.5°C(2.7°F)/hour, for a fire of 650°C (1200°F).

[CGD 88–100, 54 FR 40042, Sept. 29, 1989, as amended by CGD 92–100, 59 FR 17028, Apr. 11, 1994; CGD 94–900, 59 FR 45139, Aug. 31, 1994]

§ 153.565 Special requirement for temperature sensors.

If a cargo listed in table 1 of this part refers to this section, temperature sensors must be used to monitor the cargo pump temperature to detect overheating due to pump failures, when carrying that cargo.

[CGD 94–900, 59 FR 45139, Aug. 31, 1994]

§ 153.602 Special requirements for cargoes reactive with water.

When Table 1 refers to this section, the air inlet to the pressure-vacuum valve for the cargo tank must be located at least 2m (approx. 6.6 ft) above the weatherdeck.

[CGD 78–128, 47 FR 21210, May 17, 1982]

TESTING AND INSPECTION

§ 153.806 Loading information.

Each tankship must have a manual containing information that enables the master to load and ballast the tankship while keeping structural stresses within design limits.

[CGD 79–023, 48 FR 51009, Nov. 4, 1983]

§ 153.808 Examination required for a Certificate of Compliance.

Before a vessel receives either an initial or a reissued Certificate of Compliance endorsed to carry a cargo from Table 1 of this part, the vessel must call at a U.S. port for an examination during which the Officer in Charge, Marine Inspection, determines whether or not the vessel meets the requirements of this chapter.

[CGD 81–052, 50 FR 8733, Mar. 5, 1985, as amended by CGD 95–027, 61 FR 26009, May 23, 1996]

§ 153.809 Procedures for having the Coast Guard examine a vessel for a Certificate of Compliance.

The owner of a foreign flag vessel wishing to have the Coast Guard conduct a Certificate of Compliance examination, as required by §153.808, must proceed as follows:

(a) Notify the Officer in Charge, Marine Inspection of the port where the vessel is to be inspected at least 7 days before the vessel arrives and arrange the exact time and other details of the examination. This notification is in addition to any other pre-arrival notice to the Coast Guard required by other regulations, but may be concurrent with the endorsement application in §153.9, and must include—

(1) The name of the vessel's first U.S. port of call;

(2) The date that the vessel is scheduled to arrive;

(3) The name and telephone number of the owner's local agent; and

(4) The names of all cargoes listed in table 1 of this part that are on board the vessel.

(b) Before the examination required by §153.808 is begun, make certain that the following plans are on board the vessel and available to the Marine Inspector. These plans include—

(1) A general arrangement (including the location of fire fighting, safety, and lifesaving gear);

(2) A capacity plan;

(3) A schematic diagram of cargo piping on deck and in tanks (including the location of all valves and pumps); and

(4) A schematic diagram of cargo tank vent piping (including the location of relief valves and flame screens).

[CGD 95–027, 61 FR 26009, May 23, 1996]

§ 153.812 Inspection for Certificate of Inspection.

The rules governing the issuance of Certificates of Inspection are contained in part 31 of this chapter.

Subpart C—Operations

DOCUMENTS AND CARGO INFORMATION

§ 153.900 Certificates and authorization to carry a bulk liquid hazardous material.

(a) Except as allowed in 33 CFR 151.33(a), no ship may carry a cargo of bulk liquid hazardous material or an NLS residue if the bulk liquid hazardous material or NLS is listed in Table 1 or carried under a written permission under paragraph (d) of this section unless the ship meets the following:

(1) The cargo must be carried in a cargo tank.

(2) If a United States ship, the ship must have a Subchapter D or I Certificate of Inspection that is endorsed to allow the cargo tank to carry the cargo.

(3) If a foreign ship, the ship must have a Certificate of Compliance that is endorsed to allow the cargo tank to carry the cargo.

(4) The ship must have an IMO Certificate of Fitness issued under § 153.12 that is endorsed to allow the cargo tank to carry the cargo if it is—

(i) A United States self-propelled ship in foreign waters; or

(ii) A United States non-self-propelled ship in the waters of another Administration signatory to MARPOL 73/78 and the cargo is a Category A, B, or C NLS.

(b) [Reserved]

(c) No ship may carry any bulk liquid cargo not listed in § 30.25–1 of this chapter, Table 151.05 of Part 151 of this chapter, Table 1 or Table 2 of this part, Table 4 of Part 154 of this chapter, 33 CFR 151.47, or 33 CFR 151.49 unless the cargo name is endorsed on the Certificate of Inspection or contained in a letter issued under paragraph (d) of this section.

(d) The Coast Guard at its discretion endorses the Certificate of Inspection with the name of or issues a letter allowing the carriage of an unlisted cargo described under paragraph (c) of this section if—

(1) The shipowner—

(i) Requests the Coast Guard to add the cargo; and

(ii) Supplies any information the Coast Guard needs to develop carriage requirements for the bulk liquid cargo; and

(2) The ship—

(i) Has a Certificate of Inspection, Certificate of Compliance, or IOPP Certificate as specified in this part;

(ii) Meets the design and equipment requirements of this part specified by the Coast Guard; and

(iii) Meets any additional requirements made by the Coast Guard.

[CGD 81–101, 52 FR 7783, Mar. 12, 1987, as amended by CGD 81–101, 53 FR 28975, Aug. 1, 1988 and 54 FR 12629, Mar. 28, 1989]

§ 153.901 Documents: Posting, availability, and alteration.

(a) No person may operate a United States ship unless the endorsed Certificate of Inspection is readily available on the ship.

(b) No person may operate a foreign ship unless the endorsed Certificate of Compliance or Certificate of Inspection is readily available on the ship.

(c) No person may operate a ship under an alternative or waiver granted under this part unless the document granting the alternative or waiver is attached to the ship's Certificate of Inspection or Certificate of Compliance.

(d) Except as allowed in paragraph (e) of this section, the Coast Guard does not accept the following if altered:

(1) Certificates of Inspection.

(2) Certificates of Compliance.

(3) Certificates of Fitness, unless the alteration is by the issuing authority.

(4) Approved Procedures and Arrangements Manuals, unless the alteration is approved by the issuing authority.

(5) NLS Certificates.

(e) A person wishing to change a Procedures and Arrangements Manual approved by the Coast Guard must submit a copy to the Coast Guard following the procedures for requesting an endorsed Certificate of Inspection in § 153.8.

[CGD 81–101, 52 FR 7783, Mar. 12, 1987]

§ 153.902 Expiration and invalidation of the Certificate of Compliance.

(a) The Certificate of Compliance shows its expiration date.

(b) The endorsement of a Certificate of Compliance under this part is invalid if the vessel does not have a valid IMO Certificate of Fitness.

(c) The endorsement on a Certificate of Compliance invalidated under paragraph (b) of this section, becomes valid again once the ship has the IMO Certificate of Fitness revalidated or reissued.

NOTE: See § 153.809 for procedures for having a Certificate of Compliance reissued.

[CGD 81–101, 52 FR 7784, Mar. 12, 1987; CGD 95–072, 60 FR 50465, Sept. 29, 1995; 60 FR 54106, Oct. 19, 1995; CGD 95–027, 61 FR 26009, May 23, 1996]

§ 153.903 Operating a United States ship in special areas: Categories A, B, and C.

No person may operate a United States ship that carries an NLS or NLS residue in a special area unless—

(a) The ship's Certificate of Inspection is endorsed in accordance with § 153.30; and

(b) The ship meets the operating requirements applying to special areas in Regulations 5, 5A, 8 and the Standards for Procedures and Arrangements of Annex II.

[CGD 81–101, 52 FR 7784, Mar. 12, 1987]

§ 153.904 Limitations in the endorsement.

No person may operate a tankship unless that person complies with all limitations in the endorsement on the tankship's Certificate of Inspection or Certificate of Compliance.

[CGD 81–052, 50 FR 8734, Mar. 5, 1985]

§ 153.905 Regulations required to be on board.

No person may operate a tankship unless the most recent editions of this part, and parts 35 and 150 of this chapter are on board.

[CGD 78–128, 47 FR 21210, May 17, 1982]

§ 153.907 Cargo information.

(a) The master shall ensure that the following information for each cargo carried under this part is readily available to those on the tankship engaged in cargo operations:

(1) The name of the cargo as listed in table 1.

(2) A description of the cargo's appearance and color.

(3) Hazards in handling the cargo.

(4) Any special handling procedures for the cargo, such as inerting.

(5) Procedures to follow if the cargo spills or leaks.

(6) Procedures for treating a person exposed to the cargo.

(7) A list of fire fighting procedures and extinguishing agents effective with cargo fires.

(8) Shipper's name.

(9) Loading point.

(10) Approximate quantity of cargo.

(11) Tank in which the cargo is located.

(12) The name of an agent in the United States authorized to accept service of legal process for the vessel.

(b) The master shall make sure that the following information for cargoes other than those carried under this part is readily available on the tankship:

(1) The name of the cargo as listed in Table 4 of Part 154 of this chapter or § 30.25–1 of this chapter if the cargo is listed in one of these two tables.

(2) The name of the cargo prescribed in the letter authorizing carriage of the cargo under § 153.900(d) if the cargo is a hazardous or flammable cargo authorized for carriage under that section.

(3) The shipper's name for the cargo and the name of the shipper if the cargo is neither a hazardous nor flammable cargo.

[CGD 81–078, 50 FR 21174, May 22, 1985; as amended by CGD 88–100, 54 FR 40042, Sept. 29, 1989]

§ 153.908 Cargo viscosity and melting point information; measuring cargo temperature during discharge: Categories A, B, and C.

(a) The person in charge of the ship may not accept a shipment of a Category A, B, or C NLS cargo having a reference to this paragraph in the ''Special Requirements'' column of Table 1 unless the person has, from the cargo's manufacturer or the person listed as the shipper on the bill of lading, a written statement of the following:

(1) For Category A or B NLS, the cargo's viscosity at 20 °C in mPa.s and, if the cargo's viscosity exceeds 25 mPa.s at 20 °C, the temperature at which the viscosity is 25 mPa.s.

(2) For Category C NLS, the cargo's viscosity at 20 °C in mPa.s and, if the cargo's viscosity exceeds 60 mPa.s at 20 °C, the temperature at which the viscosity is 60 mPa.s. If the cargo's viscosity varies from shipment to shipment, the maximum viscosity and maximum temperature values may be supplied.

(b) The person in charge of the ship may not accept a shipment of a Category A, B, or C cargo having a reference to this paragraph in the ''Special Requirements'' column of Table 1 unless the person has a written statement of the cargo's melting point in °C from the cargo's manufacturer or the person listed as the shipper on the bill of lading. If the cargo's melting point varies from shipment to shipment, the highest melting point may be supplied.

(c) The person in charge of the ship shall ensure that the cargo temperature is read and recorded in the Cargo Record Book following the procedures in paragraph (d) of this section when a cargo having a reference to paragraph (a) or (b) of this section in the ''Special Requirements'' column of Table 1 is unloaded.

(d) The cargo temperature measured in paragraph (c) of this section must be made using the following procedure:

(1) Each reading must be made with the sensor or thermometer required by §153.440(a)(3) or (c). If a portable thermometer is used, it must be located as prescribed for the temperature sensor in §153.440(a)(3).

(2) A total of 2 readings must be made, the first reading to be made no more than 30 minutes after cargo transfer begins and the second reading no more than 30 minutes before the main cargo pump is shut down.

(3) The cargo's temperature is the average of the 2 readings made under paragraph (d)(2) of this section.

[CGD 81–101, 52 FR 7784, Mar. 12, 1987]

§153.909 Completing the Cargo Record Book and record retention: Categories A, B, C, and D.

(a) The person in charge of a ship shall ensure that the Cargo Record Book required under §153.490 is completed immediately after any of the following occurs:

(1) An NLS cargo is loaded.

(2) An NLS cargo is transferred between tanks on a ship.

(3) An NLS cargo is unloaded from a tank.

(4) A tank that last carried an NLS cargo is prewashed under this part.

(5) A tank that last carried an NLS cargo is washed, except as reported under paragraph (a)(4) of this section, cleaned, or ventilated.

(6) Washings from a tank that last carried an NLS cargo are discharged to the sea.

(7) Tanks that last carried an NLS cargo are ballasted.

(8) Ballast water is discharged to the sea from a cargo tank that last carried an NLS.

(9) An NLS cargo or NLS residue is discharged to the sea by accident or except as allowed by this part.

(10) A Surveyor is present during an operation that this part requires the presence of a Surveyor.

(11) NLS residue or NLS cargo is transferred from cargo pumproom bilges or transferred to an incinerator.

(12) A waiver is issued to the ship, ship owner, ship operator, or person in charge of the ship under this part.

(13) The concentration of a Category A NLS residue is measured under §153.1120(a).

(14) Any discharge recording equipment required by §153.481(b)(2) fails.

(b) The person in charge of the ship shall ensure that the Cargo Record Book is on board and readily available for inspection and copying by the Coast Guard and when the ship is a U.S. ship in the waters of a foreign country whose Administration is signatory to MARPOL 73/78, the authorities of that country.

(c) Each officer in charge of an operation listed under paragraph (a) of this section, and each Surveyor observing an operation that this part requires the presence of a Surveyor, shall attest to the accuracy and completeness of each Cargo Record Book entry concerning those operations by signing after each entry.

(d) After all the entries on a page of the Cargo Record Book are completed, and if the person in charge of the ship agrees with the entries, the person in charge of the ship shall sign the bottom of that page.

(e) The ship owner or operator shall ensure that—

(1) Each Cargo Record Book is retained on board the ship for at least 3 years after the last entry; and

(2) Each discharge recording required by §153.1126(b)(1) is retained on board the ship for at least three years.

[CGD 81–101, 52 FR 7784, Mar. 12, 1987]

§153.910 Cargo piping plan.

No person may operate a tankship unless the tankship has a cargo piping plan that:

(a) Shows all cargo piping on the tankship;

(b) Shows all cargo valving, pumps, and other equipment that is used during cargo transfer;

(c) Shows the cargo tanks;

(d) Shows any modifications necessary to a containment system that is to be separated as prescribed under Part 150 of this subchapter, or §§ 153.525 and 153.1020;

(e) Emphasizes the piping and equipment described in paragraphs (a), (b) and (d) of this section by using contrasting colors, line widths, or similar methods; and

(f) Shows the cargo loading rates chosen under § 153.365(b) for all applicable cargo lines.

[CGD 73–96, 42 FR 49027, Sept. 26, 1977, as amended by CGD 78–128, 47 FR 21210, May 17, 1982]

§ 153.912 Certificate of inhibition or stabilization.

(a) When a cargo in Table 1 is referred to this section, no person may operate a tankship carrying the cargo without a written certification, carried on the bridge of the tankship, from the shipper that the cargo is:

(1) Inhibited; or

(2) Stabilized.

(b) The certification required by this section must contain the following information:

(1) Whether the cargo is inhibited or stabilized.

(2) The name and concentration of the inhibitor or stabilizer.

(3) The date the inhibitor or stabilizer was added.

(4) The length of time the inhibitor or stabilizer is effective.

(5) Any temperature limitations qualifying the inhibitor's or stabilizer's effective lifetime.

(6) The action to be taken should the duration of the voyage exceed the inhibitor's or stabilizer's useful life.

GENERAL CARGO OPERATIONAL REQUIREMENTS

§ 153.920 Cargo quantity limitations.

(a) No person may load a cargo tank or operate a tankship that carries a cargo tank containing in excess of 1250 m^3 (approx. 44,138 ft^3) of cargo requiring a type I containment system.

(b) No person may load a cargo tank or operate a tankship that carries a cargo tank containing in excess of 3000 m^3 (approx. 105,932 ft^3) of a cargo requiring a type II containment system.

§ 153.921 Explosives.

No person may load, off-load, or carry a cargo listed in this part on board a vessel that carries explosives unless he has the prior written permission of the Commandant (G–MSO).

[CGD 73–96, 42 FR 49027, Sept. 26, 1977, as amended by CGD 82–063b, 48 FR 4782, Feb. 3, 1983]

§ 153.923 Inerting systems.

The master shall ensure that the inert gas systems for any cargo that this part requires to be inerted are operating correctly.

GENERAL VESSEL SAFETY

§ 153.930 Cargo antidotes.

No person may operate a tankship that carries a cargo listed in Table 1 unless the tankship has on board the antidotes described for the cargo in the *Medical First Aid Guide for Use in Accidents Involving Dangerous Goods*, published by IMO.

§ 153.931 Obstruction of pumproom ladderways.

The master shall ensure that all cargo pumproom ladderways are unobstructed at all times.

§ 153.932 Goggles and protective clothing.

(a) The master shall ensure that each person wear a face mask or tight-fitting goggles for eye protection against splashing or spraying liquids if that person is:

(1) Sampling cargo;

(2) Transferring cargo;

(3) Making or breaking a cargo hose connection;

(4) Gauging a cargo tank; or

(5) Opening a cargo tank by opening a Butterworth hatch, ullage hatch, cargo tank hatch, or similar opening.

(b) The master shall ensure that each person wear a face mask or tight-fitting goggles for eye protection against splashing or spraying liquids if the person is:

(1) In the area of the deck where the cargo tanks, cargo piping, and cargo pumprooms are located while a cargo transfer is taking place; or

(2) In a cargo pumproom, an enclosed space adjacent to a cargo tank, or a

space containing part of a cargo containment system.

(c) The master shall ensure that each person in paragraphs (a) and (b) of this section wear any additional protective clothing the master believes necessary to protect the person from the cargo's hazards.

[CGD 73–96, 42 FR 49027, Sept. 26, 1977, as amended by CGD 78–128, 47 FR 21210, May 17, 1982]

§ 153.933 Chemical protective clothing.

When table 1 refers to this section, the following apply:

(a) The master shall ensure that the following chemical protective clothing constructed of materials resistant to permeation by the cargo being handled is worn by all personnel engaged in an operation listed in paragraph (b) of this section:

(1) Splash protective eyewear.

(2) Long-sleeved gloves.

(3) Boots or shoe covers.

(4) Coveralls or lab aprons.

NOTE: ''Guidelines for the Selection of Chemical Protective Clothing'', Third Edition, 1987, available from the American Conference of Governmental Industrial Hygienists, 6500 Glenway Ave., Cincinnati, OH 45211–4438, provides information on the proper clothing for the cargo being handled.

(b) This section applies during the following operations:

(1) Sampling cargo.

(2) Transferring cargo.

(3) Making or breaking cargo hose connections.

(4) Gauging a cargo tank, unless gauging is by closed system.

(5) Opening cargo tanks.

(c) Coveralls or lab aprons may be replaced by splash suits or aprons constructed of light weight or disposable materials if, in the judgment of the master—

(1) Contact with the cargo being handled is likely to occur only infrequently and accidentally; and

(2) The splash suit or apron is disposed of immediately after contamination.

(d) Splash protective eyewear must be tight-fitting chemical-splash goggles, face shields, or similar items intended specifically for eye protection from chemical splashing or spraying.

(e) The master shall ensure that each person in the vicinity of an operation listed in paragraph (b) of this section or in the vicinity of tanks, piping, or pumps being used to transfer the cargo wears splash protective eyewear under paragraph (d) of this section.

[CGD 88–100, 54 FR 40042, Sept. 29, 1989; 55 FR 17276, Apr. 24, 1990]

§ 153.934 Entry into spaces containing cargo vapor.

(a) No person may enter a cargo tank, cargo handling space, pumproom or enclosed space in the cargo area without the permission of the master.

(b) Before permitting anyone to enter a cargo tank, cargo handling space, pumproom or other enclosed space in the cargo area, the master shall make sure that:

(1) The space is free of toxic vapors and has sufficient oxygen to support life; or

(2) Those entering the space wear protective equipment with self-contained breathing apparatus as described in § 153.214(b) and an officer closely supervises the entire operation.

[CGD 73–96, 42 FR 49027, Sept. 26, 1977, as amended by CGD 78–128, 47 FR 21210, May 17, 1982]

§ 153.935 Opening of tanks and cargo sampling.

(a) Except as provided in paragraph (b) of this section, the master shall ensure that all cargo tank hatches, ullage openings, and tank cleaning openings are tightly closed at all times.

(b) The master may not authorize the opening of a cargo tank, except:

(1) To clean a tank;

(2) To transfer a cargo that Table 1 allows in a containment system having an open gauging system;

(3) To sample a cargo that Table 1 allows in a containment system having an open gauging system; or

(4) To sample a cargo that Table 1 allows in a containment system having a restricted gauging system if:

(i) The tank is not being filled during sampling;

(ii) The vent system has relieved any pressure in the tank;

(iii) The person sampling the cargo wears the protective clothing required during cargo transfer; and

(iv) The tank is closed tightly following sampling.

(c) The master shall make sure that cargoes requiring closed gauging are sampled only through the controlled sampling arrangement required by § 153.404(d).

[CGD 73–96, 42 FR 49027, Sept. 26, 1977, as amended by CGD 78–128, 47 FR 21210, May 17, 1982]

§ 153.935a Storage of cargo samples.

(a) The master shall make sure that any cargo samples are stored in:

(1) A designated and ventilated space in the cargo area of the vessel; or

(2) An area approved by the Commandant (G–MSO) or the tankship's flag administration for the stowage of cargo samples.

(b) The master shall make sure that cargo sample bottles are stored:

(1) In a way that prevents shifting of the sample bottles when the vessel is at sea;

(2) In bins or containers constructed of materials that are resistant to the cargo samples; and

(3) Apart from other sample bottles containing incompatible liquids (See part 150, subpart A).

[CGD 78–128, 47 FR 21211, May 17, 1982, as amended by CGD 82–063b, 48 FR 4782, Feb. 3, 1983]

§ 153.936 Illness, alcohol, drugs.

The master shall ensure that no person participates in cargo related operations who appears to be intoxicated by alcohol or drugs or to be so ill as to be unfit for the particular operation.

MARKING OF CARGO TRANSFER HOSE

§ 153.940 Standards for marking of cargo hose.

No person may mark a hose assembly as meeting the standards of this section unless the hose assembly meets the following requirements:

(a) Each hose assembly must have:

(1) Fully threaded connections;

(2) Flanges that meet ANSI B16.5, B16.24, or B16.31; or

(3) Class 1 quick-disconnect couplings that comply with ASTM F–1122, and are marked ''C1–1.''

(b) Each hose assembly must be marked with the:

(1) Date of manufacture;

(2) Working pressure discribed in paragraph (d) of this section;

(3) Date of the last test made as prescribed in paragraph (e) of this section; and

(4) Manufacturer's recommended maximum and minimum temperatures.

(c) A cargo hose assembly must have a minimum bursting pressure as stated by the manufacturer of at least 5152 kPa gauge (approx. 750 psig).

(d) The working pressure marked on a hose must meet the following:

(1) Be at least 1030 kPa gauge (approx. 150 psig).

(2) Not exceeded 20 per cent (one-fifth) of the manufacturer's stated bursting pressure.

(3) Not exceed the manufacturer's recommended working pressure.

(4) Not exceed the test pressure used in the latest test under paragraph (e)(3) of this section.

(e) A cargo hose assembly must be inspected and tested by placing it in a straight, horizontal position so that its entire external surface is accessible. It must be ascertained that the hose assembly:

(1) Has no loose covers, kinks, bulges, soft spots, and no gouges, cuts, or slashes that penetrate any hose reinforcement;

(2) Has no external and, to the extent internal inspection is possible with both ends of the hose open, no internal deterioration; and

(3) Does not burst, bulge, leak, or abnormally distort under static liquid pressure at least as great as the recommended working pressure.

[CGD 73–96, 42 FR 49027, Sept. 26, 1977, as amended by CGD 78–128, 47 FR 21211, May 17, 1982; CGD 88–032, 56 FR 35827, July 29, 1991]

CARGO TRANSFER PROCEDURES

§ 153.953 Signals during cargo transfer.

The master shall ensure that:

(a) The tankship displays a red flag in the day and a red light at night when transferring cargo while fast to a dock;

(b) The tankship displays a red flag when transferring cargo while at anchor; and

(c) The red flag or the red light is visible from all sides of the tankship.

§153.955 Warning signs during cargo transfer.

(a) When transferring cargo while fast to a dock or at anchor in port, the master shall ensure that the tankship displays a warning sign at the gangway facing the shore so that it may be seen from the shore and another warning sign facing outboard toward the water so that it may be seen from the water. (See figure 1).

(b) Except as provided in paragraph (f) of this section, each warning sign must have the following legends:

(1) Warning.

(2) Dangerous Cargo.

(3) No Visitors.

(4) No Smoking.

(5) No Open Lights.

(c) Each letter must be block style, black on a white background.

(d) Each letter must:

(1) Be 7.5 cm (approx. 3 in.) high;

(2) Be 5 cm (approx. 2 in.) wide except for ''M'' and ''W'' which must be 7.5 cm (approx. 3 in.) wide and the letter ''I'' which may be 1.3 cm (approx. ½ in.) wide; and

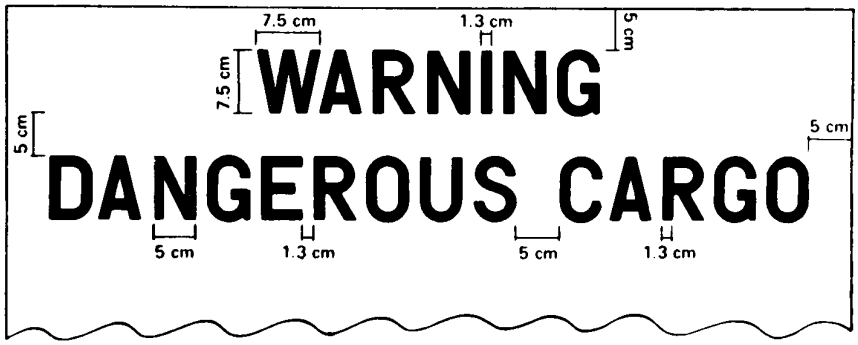

Figure 1 - Minimum Dimensions for Warning Sign

(3) Have 1.3 cm (approx. ½ in.) stroke width.

(e) The spacing must be:

(1) 1.3 cm (approx. ½ in.) between letters of the same word;

(2) 5 cm (approx. 2 in.) between words;

(3) 5 cm (approx. 2 in.) between lines; and

(4) 5 cm (approx. 2 in.) at the borders of the sign.

(f) Except as described in §153.1045, the legends ''No Smoking'' and ''No Open Lights'' are not required when the cargoes on board the tankship are neither flammable nor combustible.

§153.957 Persons in charge of transferring liquid cargo in bulk or cleaning cargo tanks.

(a) The owner and operator of the vessel, and his or her agent, and each of them, shall ensure that—

(1) Enough ''Tankerman-PICs'' or restricted ''Tankerman-PICs'', and ''Tankerman-Assistants'', authorized for the classification of cargo carried, are on duty to safely transfer liquid cargo in bulk or to safely clean cargo tanks;

(2) Each transfer of liquid cargo in bulk and each cleaning of a cargo tank is supervised by a qualified person designated as a person in charge of the transfer or the cleaning under Subpart C of 33 CFR part 155;

(3) When cargo regulated under this part is due for transfer, the person in charge of the transfer has received special training in the particular hazards associated with the cargo and in all special procedures for its handling; and

(4) On each foreign vessel, the person in charge understands his or her responsibilities as described in this subchapter.

(b) Upon request by the Officer in Charge, Marine Inspection, in whose zone the transfer will take place, the owner and operator of the vessel, and his or her agent, and each of them, shall provide documentary evidence that the person in charge has received the training specified by paragraph (a)(3) of this section and is capable of competently performing the procedures necessary for the cargo.

[CGD 79–116, 60 FR 17158, Apr. 4, 1995]

§ 153.959 Approval to begin transfer operations required.

No person may make connections for cargo transfer or transfer cargo unless he has authorization from the person in charge of cargo transfer.

§ 153.964 Discharge by gas pressurization.

The person in charge of cargo transfer may not authorize cargo discharge by gas pressurization unless:

(a) The tank to be offloaded has an SR or PV venting system;

(b) The pressurization medium is either the cargo vapor or a nonflammable, nontoxic gas inert to the cargo; and

(c) The pressurizing line has:

(1) A pressure reducing valve whose setting does not exceed 90% of the tank's relief valve setting and a manual control valve between the pressure reducing valve and the tank; or

(2) For an inert gas medium:

(i) A safety relief valve with a cross sectional flow area at least equal to that of the pressurizing line and whose relieving pressure does not exceed 90 percent of the tank's relief valve setting;

(ii) A manual control valve between the safety relief valve and the tank; and

(iii) A check valve between the manual control valve and the tank.

§ 153.966 Discharge by liquid displacement.

The person in charge of cargo transfer may not authorize cargo discharge by liquid displacement unless the liquid supply line to the tank has:

(a) A safety relief or pressure reducing valve set to operate at no more than 80 percent of the tank's relief valve setting; and

(b) A manual control valve between the tank and the supply line's safety relief valve or pressure reducing valve.

§ 153.968 Cargo transfer conference.

(a) Before he may begin making connections for cargo transfer, the person in charge of cargo transfer shall confer with the person supervising the cargo transfer at the facility.

(b) The person in charge of cargo transfer shall discuss the important aspects of the transfer operation, such as the following, with the supervisor at the facility:

(1) The products to be transferred.

(2) The cargo loading rates marked on the cargo piping plan or the maximum safe transfer rates.

(3) The critical or hazardous stages of the transfer operation.

(4) The emergency procedures in case of a spill.

(5) If the vessel is equipped with the tank overflow alarm prescribed in §153.408(c), a procedure for shutdown of shore pumps, shore valves, and ship's valves that prevents piping system pressures from exceeding those for which the piping system is designed.

[CGD 73–96, 42 FR 49027, Sept. 26, 1977, as amended by CGD 78–128, 47 FR 21211, May 17, 1982; CGD 81–078, 50 FR 21174, May 22, 1985]

§ 153.970 Cargo transfer piping.

The person in charge of cargo transfer shall ensure that:

(a) Cargo is transferred to or from a cargo tank only through the tankship's cargo piping system;

(b) Vapor not returned to shore through the tankship's vapor return system is discharged at the height required for the cargo's vent riser in Table 1, and

(c) All cargo vapor is returned to shore through the valved connection on the venting system if:

(1) The cargo requires closed gauging, is referenced to § 153.372 or is referenced to § 153.525;

(2) The transfer terminal has vapor return equipment; and

(3) In his estimation the vapor return equipment is adequate to handle the vapor expected from the tank.

§ 153.972 Connecting a cargo hose.

The person in charge of cargo transfer may not authorize the connection of a hose to a cargo containment system unless:

(a) He has ensured himself that the cargo will not weaken or damage the hose;

(b) The hose is marked as meeting the standards of § 153.940;

(c) The date of the hose's last pressure test is within one year of the date on which the hose is used to transfer cargo;

(d) The recommended working pressure marked on a hose used for discharge meets or exceeds the working pressure marked on the cargo piping at the hose connection; and

(e) The cargo's temperature is within the manufacturer's recommended maximum and minimum hose temperatures.

§ 153.975 Preparation for cargo transfer.

The person in charge of cargo transfer may not approve or continue cargo transfer unless the following conditions are met:

(a) No fires or open flames are on deck or in compartments near the hose connections when Table 1 requires the cargo's containment system to have a fire protection system.

(b) Any electrical bonding of the tankship to the transfer facility is made before the cargo transfer piping is joined.

(c) Any supplemental inert gas supply necessary to maintain the 3.5 kPa gauge (approx. 0.5 psig) pressure in the tank during offloading (see § 153.500) is connected to the inert gas pressure control system.

(d) The transfer connections have enough slack to allow for vessel movement.

(e) The transfer connections are supported by tackles.

(f) The cargo high level alarms, tank overflow alarms and overflow control systems are functioning correctly when the cargo is loaded.

(g) Joints and couplings are gasketed and mated tightly.

(h) Flanges are bolted tightly.

(i) No repair work is underway in areas where cargo or cargo vapors may collect.

(j) Cargo and sea valves are properly set, with those sea valves connected to cargo piping lashed or sealed shut.

(k) Venting system bypass valves are set for cargo transfer and are operating properly.

(l) All scuppers are plugged.

(m) Smoking is limited to safe places.

(n) Fire fighting and safety equipment is ready.

(o) He is in effective communication with the transfer terminal.

(p) The person in charge of the transfer terminal has acknowledged that he is ready to transfer.

(q) Pressures within the cargo transfer and containment systems do not exceed the pressure ranges for which the transfer hose and containment systems are designed.

(r) No vessels that would hazard cargo transfer are alongside the tankship.

[CGD 73–96, 42 FR 49027, Sept. 26, 1977, as amended by CGD 78–128, 47 FR 21211, May 17, 1982]

§ 153.976 Transfer of packaged cargo or ship's stores.

The person in charge of cargo transfer may neither begin nor continue the transfer of a flammable or combustible cargo while packaged cargo or ship's stores are transferred unless transfer of the packaged cargo or ship's stores does not hazard transfer of the flammable or combustible cargo.

§ 153.977 Supervision of cargo transfer.

The person in charge of cargo transfer shall:

(a) Supervise the operation of cargo system valves;

(b) Monitor the cargo loading rate to ensure it does not exceed that stated on the cargo piping plan; and

(c) Monitor the cargo level in the tanks to make sure they do not overflow.

[CGD 78–128, 47 FR 21211, May 17, 1982]

§ 153.979 Gauging with a sounding tube.

(a) No person may remove the cover of a sounding tube unless he has authorization from the person in charge of cargo transfer.

(b) The person in charge of cargo transfer may not authorize removal of the cover from a sounding tube gauge unless all tank pressure has been relieved through the tank's venting system.

§ 153.980 Isolation of automatic closing valves.

The person in charge of cargo transfer may isolate automatic closing valves described in §153.408(b) from a cargo containment system if the following conditions are met:

(a) The containment system carries products to which §153.408 does not apply.

(b) The valves are isolated by:

(1) Removing the valves; or

(2) Installing removable pipes and blind flanges to by-pass the valves.

[CGD 78–128, 47 FR 21211, May 17, 1982]

§ 153.981 Leaving room in tank for cargo expansion.

The person in charge of cargo transfer shall ensure that the amount of cargo in a tank does not exceed the tank's capacity at any ambient temperature between −18°C (approx. 0° F) and 46° C (approx. 115° F).

§ 153.983 Termination procedures.

Upon completion of the transfer operation, the person in charge of cargo transfer shall ensure that:

(a) The cargo transfer connections are closed off;

(b) The transfer lines and hoses are drained of cargo, either into the tank or back to the transfer terminal;

(c) Any electrical bonding between the vessel and the shore facility is broken only after the cargo hose is disconnected and all spills removed; and

(d) Each vent system is returned to its nonloading configuration.

SPECIAL CARGO PROCEDURES

§ 153.1000 Special operating requirements for cargoes reactive with water.

When Table 1 refers to this section, the master must ensure that the cargo:

(a) Is carried only in a containment system completely isolated from any systems containing water, such as slop tanks, ballast tanks, cargo tanks containing slops or ballast, their vent lines or piping; and

(b) Is separated by double walls, such as cofferdams and piping tunnels, from any system containing water, as for example those described in paragraph (a) of this section.

§ 153.1002 Special operating requirements for heat sensitive cargoes.

When Table 1 refers to this section, the master shall make sure that:

(a) The cargo temperature is maintained below the temperature that would induce polymerization, decomposition, thermal instability, evolution of gas or reaction of the cargo;

(b) Any heating coils in the cargo tank are blanked off; and

(c) The cargo is not carried in uninsulated deck tanks.

[CGD 78–128, 47 FR 21211, May 17, 1982]

§ 153.1003 Prohibited carriage in deck tanks.

When Table 1 refers to this section, cargoes may not be carried in deck tanks.

[CGD 95–900, 60 FR 34050, June 29, 1995]

§ 153.1004 Inhibited and stabilized cargoes.

(a) Before loading a cargo containment system with a cargo referenced to this section in Table 1, the person in charge of cargo transfer shall make sure that the cargo containment system is free of contaminants that could:

(1) Catalyze the polymerization or decomposition of the cargo; or

(2) Degrade the effectiveness of the inhibitor or stabilizer.

(b) The master shall make sure that the cargo is maintained at a temperature which will prevent crystallization or solidification of the cargo.

[CGD 78–128, 47 FR 21211, May 17, 1982]

§153.1010 Alkylene oxides.

(a) Before each loading of a cargo containment system with a cargo referenced to this section in Table 1, the person in charge of cargo transfer shall:

(1) Unless the tankship is equipped with independent cargo piping that meets paragraph (d) of this section:

(i) Obtain verification from a Coast Guard Marine Inspector or from a representative of the tankship's flag administration that separation of the alkylene oxide piping system complies with alkylene oxide handling plans approved by the Coast Guard or the tankship's flag administration; and

(ii) Make sure that each spectacle flange and blank flange connection that is required to separate alkylene oxide piping systems from other systems has a wire and seal attached by a Coast Guard Marine Inspector or a representative of the tankship's flag administration.

(2) Purge the containment system until the oxygen content of the cargo tank is less than 2% by volume.

(b) The person in charge of an alkylene oxide cargo transfer shall ensure that:

(1) No alkylene oxide vapor or liquid is released to the atmosphere during cargo transfer;

(2) No vapor return system connected to an alkylene oxide containment system is at the same time connected to another containment system;

(3) Alkylene oxide is discharged only by an intank cargo pump or inert gas displacement;

(4) Transfer hose is approved by the Commandant (G–MSO) under §153.530(o) for alkylene oxide transfer and is marked ''For Alkylene Oxide Transfer Only''; and

(5) A water hose is laid out on deck with water pressure to the nozzle, and all alkylene oxide spillages are washed away immediately.

(c) While alkylene oxides are onboard the vessel, the master shall make sure that the oxygen content of the vapor space above the alkylene oxide and those spaces specified in §153.530 (k) and (l) is maintained below 2% by volume.

(d) Tankships with independent piping for alkylene oxides must have onboard:

(1) Alkylene oxide handling plans approved by the Coast Guard or the tankship's flag administration; and

(2) Certification from the Coast Guard or the tankship's flag administration that the cargo piping for alkylene oxides is independent.

[CGD 73–96, 42 FR 49027, Sept. 26, 1977, as amended by CGD 78–128, 47 FR 21211, May 17, 1982; CGD 82–063b, 48 FR 4782, Feb. 3, 1983]

§153.1011 Changing containment systems and hoses to and from alkylene oxide service.

(a) The person in charge of cargo transfer shall make sure that:

(1) No alkylene oxide is loaded into a containment system that last carried a cargo other than an alkylene oxide unless the containment system has been cleaned and inspected to make sure it is in good condition with no heavy rust accumulations or traces of previous cargoes;

(2) No alkylene oxide is loaded into a containment system that within the previous three loadings carried a cargo listed in paragraph (b) of this section unless the containment system has been cleaned to the satisfaction of a Coast Guard Marine Inspector or a person specifically authorized by the Commandant (G–MSO) to approve alkylene oxide tank cleaning;

(3) No cargo but an alkylene oxide is loaded into a containment system which last carried an alkylene oxide unless the containment system has been cleaned of alkylene oxide to the satisfaction of a Coast Guard Marine Inspector or person specifically authorized by the Commandant (G–MSO) to approve alkylene oxide tank cleaning; and

(4) No hose marked ''For Alkylene Oxide Transfer Only'' is used for the transfer of a cargo other than an alkylene oxide.

(b) The following cargoes are particularly reactive with alkylene oxides:

(1) Non-oxidizing mineral acids (e.g. hydrochloric, phosphoric);

(2) Sulfuric acid;

(3) Nitric acid;

(4) Organic acids (e.g. acetic, formic);

(5) Halogenated organic acids (e.g. chloroacetic);

(6) Sulfonic acids (e.g. alkyl benzene sulfonic);

(7) Caustic alkalies (e.g. caustic soda, caustic potash; sodium hydrosulfide);

(8) Ammonia and ammonia solutions;

(9) Aliphatic amines;

(10) Alkanolamines; and

(11) Oxidizing substances.

[CGD 78–128, 47 FR 21211, May 17, 1982, as amended by CGD 82–063b, 48 FR 4782, Feb. 3, 1983; CGD 81–078, 50 FR 21174, May 22, 1985]

§ 153.1020 Unusually toxic cargoes.

(a) No person may load or carry a cargo referenced to this section in Table 1 unless the cargo's piping and venting systems are separated from piping and venting systems carrying cargoes not referred to this section.

(b) The master shall ensure that no heat transfer medium that has been circulated through a cargo referenced to this section in Table 1 is circulated through a cargo not referenced to this section unless he determines the medium to be uncontaminated with cargo.

(c) No person may discharge overboard condensed steam from the heating system of a cargo referenced to this section in Table 1 unless he first determines the condensate to be uncontaminated with cargo.

[CGD 73–96, 42 FR 49027, Sept. 26, 1977, as amended by CGD 78–128, 47 FR 21212, May 17, 1982]

§ 153.1025 Motor fuel antiknock compounds.

(a) No person may load or carry any other cargo in a containment system approved for motor fuel antiknock compounds containing lead alkyls except a cargo to be used solely in the manufacture of motor fuel antiknock compounds.

(b) The master shall ensure that no person enter a pumproom or void space that contains piping from a containment system approved for motor fuel antiknock compounds containing lead alkyls unless:

(1) The pumproom or void space atmosphere has been analyzed for its lead (as Pb) content and found to be less than 0.075 mg/m^3 ; or

(2) The person follows the procedures for entering a cargo tank described in paragraph (c) of this section.

(c) No person may enter a cargo tank endorsed for motor fuel antiknock compounds containing lead alkyls without prior specific authorization from the Commandant (G–MSO). This authorization may be obtained by telephone ((202) 267–1217) if the person has previously obtained approval for the cargo tank entry procedure from the Commandant (G–MSO).

(d) No person may enter a cargo tank endorsed for motor fuel antiknock compounds if he does not follow the conditions in the authorization under paragraph (c) of this section.

[CGD 73–96, 42 FR 49027, Sept. 26, 1977, as amended by CGD 78–128, 47 FR 21212, May 17, 1982; CGD 82–063b, 48 FR 4782, Feb. 3, 1983; CGD 88–100, 54 FR 40042, Sept. 29, 1989]

§ 153.1035 Acetone cyanohydrin or lactonitrile solutions.

No person may operate a tankship carrying a cargo of acetone cyanohydrin or lactonitrile solutions, unless that cargo is stabilized with an inorganic acid.

[CGD 88–100, 54 FR 40042, Sept. 29, 1989]

§ 153.1040 Carbon disulfide.

(a) No person may load, carry, or discharge carbon disulfide unless the cargo tank has a water pad over the cargo of at least one meter (approx. 40 in.).

(b) The person in charge of a carbon disulfide transfer operation shall ensure that carbon disulfide is discharged only by displacement or intank cargo pump.

(c) No person may remove a cargo pump for a containment system that carries carbon disulfide unless:

(1) The containment system has a gas free certificate issued under the standards in § 35.01–1 of this chapter; or

(2) The vapor space in the pump well is filled with water.

§ 153.1045 Inorganic acids.

When Table 1 refers to this section, the person in charge of cargo transfer shall ensure that the legends ''NO SMOKING'' and ''NO OPEN LIGHTS''

are displayed on the warning sign required in §153.955(a) when cargo is transferred.

§153.1046 Sulfuric acid.

No person may liquefy frozen or congealed sulfuric acid other than by external tank heating coils.

§153.1052 Carriage of other cargoes in acid tanks.

No person shall load or carry other cargoes in a cargo containment system of a U.S. flag ship endorsed to carry sulfuric acid, hydrochloric acid, or phosphoric acid with out specific authorization from the Commandant (G–MSO).

[CGD 94–900, 59 FR 45139, Aug. 31, 1994]

§153.1060 Benzene.

The person in charge of a Coast Guard inspected vessel must ensure that the provisions of part 197, subpart C, of this chapter are applied.

[CGD 88–040, 56 FR 65006, Dec. 13, 1991]

§153.1065 Sodium chlorate solutions.

(a) No person may load sodium chlorate solutions into a containment system that previously carried another cargo unless the containment system is thoroughly washed before loading.

(b) The person in charge of cargo transfer shall make sure that spills of sodium chlorate solutions are immediately washed away.

[CGD 81–078, 50 FR 21174, May 22, 1985]

APPROVAL OF SURVEYORS AND HANDLING OF CATEGORIES A, B, C, AND D CARGO AND NLS RESIDUE

SOURCE: CGD 81–101, 52 FR 7785, Mar. 12, 1987, unless otherwise noted.

§153.1100 Responsibility of the person in charge.

The person in charge of the ship shall ensure that—

(a) The requirements of §§153.1102 through 153.1132 are met; and

(b) The procedures in the approved Procedures and Arrangements Manual are followed.

§153.1101 Procedures for getting a Surveyor: Approval of Surveyors.

(a) At least 24 hours before a Surveyor is needed, the person wishing the services of a Surveyor must contact the Captain of the Port or the Marine Safety Office that has jurisdiction over the port at which the Surveyor will be needed to—

(1) Arrange for the Coast Guard to provide a Surveyor; or

(2) Inform the Coast Guard of the selection of a Surveyor from one of the organizations accepted by the Coast Guard to provide Surveyors.

(b) Organizations may be accepted by the Coast Guard to provide Surveyors if they—

(1) Are engaged, as a regular part of their business, in performing inspections or tests of bulk liquid cargo tanks or bulk liquid cargo handling equipment;

(2) Are familiar with the references in §153.0(b) and with the requirements of this part;

(3) Are not controlled by the owners or operators of ships needing the services of the Surveyors or the facilities at which those ships would unload cargo;

(4) Are not dependent on Coast Guard acceptance under this section to remain in business; and

(5) Sign a Memorandum of Understanding with the Coast Guard.

(c) Each application for acceptance as a Surveyor must be submitted to the Commandant (G–MSO) and must contain the following:

(1) The name and address of the organization, including subsidiaries and divisions, requesting acceptance by the Coast Guard to provide Surveyors.

(2) A statement that the organization is not controlled by the owners or operators of ships needing the services of Surveyors or the facilities at which these ships would unload, or a full disclosure of any ownership or controlling interest held by such parties.

(3) A description of the experience and qualifications of the personnel who would be performing the function of Surveyor.

(4) A statement that the persons who will be performing the function of Surveyor have been trained in and are familiar with the requirements of Annex II and the regulations in this part.

(5) A statement that the Coast Guard may verify the information submitted in the application and may examine the persons who will be performing the function of Surveyor to determine their qualifications.

(d) The acceptance of an organization may be terminated by the Commandant if the organization fails to properly perform or supervise the inspections required in this part.

§ 153.1102 Handling and disposal of NLS residue: Cateqories A, B, C, and D.

(a) Except those Category A NLS residues that must be discharged under paragraph (c) of this section, NLS residue from an NLS whose vapor pressure is 5 kPa (50 mbar) or less at 20 °C (68 °F) must be—

NOTE TO PARAGRAPH (a): The Marine Protection, Research, and Sanctuaries Act allows specific liquids to be discharged to the sea under permits issued by the EPA.

(1) Unloaded to any consignee;

(2) Returned to the shipper;

(3) Discharged to a reception facility;

(4) Retained on the ship; or

(5) Discharged to the sea under § 153.1126 or § 153.1128.

(b) Except those Category A NLS residues that must be discharged under paragraph (c) of this section, NLS residue from an NLS whose vapor pressure is greater than 5 kPa (50 mbar) at 20 °C must be—

(1) Handled in the same way as the NLS residue under paragraph (a) of this section; or

(2) Ventilated following a ventilation procedure in the approved Procedures and Arrangements Manual.

NOTE: The Clean Air Act (42 U.S.C. 7401 *et seq*) allows states to regulate emissions from tank ventilation. There may be other regulations, both local and Federal, that affect the use of tank ventilation for safety or environmental purposes.

(c) NLS residue containing Category A NLS in pumproom bilges and in spill trays at the manifold must be discharged to a reception facility.

[CGD 81–101, 52 FR 7785, Mar. 12, 1987, as amended by CGD 81–101, 53 FR 28975, Aug. 1, 1988 and 54 FR 12629, Mar. 28, 1989]

§ 153.1104 Draining of cargo hose: Categories A, B, C, and D.

Before a cargo hose used in discharging an NLS from a ship's cargo tank is disconnected, the hose must be drained back to the transfer terminal unless the tank unloading the cargo has a waiver under § 153.483 or § 153.491.

[CGD 81–101, 53 FR 28975, Aug. 1, 1988 and 54 FR 12629, Mar. 28, 1989]

§ 153.1106 Cleaning agents.

No tank cleaning agent other than water or steam may be used to clean an NLS residue from a cargo tank except as prescribed in the approved Procedures and Arrangements Manual.

§ 153.1108 Heated prewash for solidifying NLS, high viscosity NLS and required prewashes of NLS whose viscosity exceeds 25 mPa sec at 20 °C: Categories A, B, and C.

(a) When a high viscosity or solidifying cargo is unloaded from a cargo tank, the cargo tank must be prewashed unless § 153.1114 or paragraph (c) of this section allows the prewash to be omitted.

(b) When a prewash is required for a tank that has unloaded a solidifying cargo or a cargo having a viscosity exceeding 25 mPa sec at 20 °C, the wash water used in the prewash must leave the tank washing machine at a temperature of at least 60 °C (140 °F).

(c) The prewash required under paragraph (a) of this section may be omitted if the approved Procedures and Arrangements Manual contains a procedure for measuring the temperature of all interior cargo tank surfaces throughout unloading and under the measuring procedure the temperature of these surfaces remains above—

(1) The temperature of the cargo's melting point if the cargo is a Category B or C solidifying NLS; or

(2) The temperature at which the cargo's viscosity exceeds—

(i) 25 mPa.s, if the cargo is a high viscosity Category B NLS; or

(ii) 60 mPa.s, if the cargo is a high viscosity Category C NLS.

[81–101, 53 FR 28975, Aug. 1, 1988 and 54 FR 12629, Mar. 28, 1989]

§153.1112 Prewash for tanks containing Category A NLS residue.

Unless §153.1114 allows the prewash to be omitted, a cargo tank that unloads a Category A NLS cargo must be prewashed following the procedures in §153.1120.

§153.1114 Conditions under which a prewash may be omitted: Categories A, B, and C.

A prewash required by this part may be omitted if one of the following requirements is met:

(a) A Surveyor has signed a statement in the Cargo Record Book that the next cargo has been determined to be one that may be loaded without washing the tank, and the tank is not washed or ballasted before it is loaded with the next cargo.

(b) A Surveyor has signed a statement in the Cargo Record Book that the approved Procedures and Arrangements Manual contains procedures for removing the NLS residue by ventilation, and the cargo tank is not washed or ballasted before being cleaned following the ventilation procedure.

NOTE: The Clean Air Act (42 U.S.C. 7401 *et seq.*) allows states to regulate emissions from tank ventilation. There may be other regulations, both local and Federal, that affect the use of tank ventilation for safety or environmental purposes.

(c) The tank requiring the prewash has a waiver issued under §153.483 or §153.491 and the waiver states when the tank is to be prewashed.

§153.1116 Prewash for tanks unloaded without following the approved Procedures and Arrangements Manual: Categories B and C.

If for any reason more Category B or C NLS residue remains in a cargo tank and transfer piping of a ship after unloading than would remain after a normal discharge of the cargo when the unloading procedures in the approved Procedures and Arrangements Manual are followed, the tank must be prewashed following the procedures in §153.1120 unless—

(a) Section 153.1114 allows the prewash to be omitted; or

(b) The residue is reduced using another procedure, and a Surveyor estimates and states in the Cargo Record Book that the cargo tank and transfer piping contain no more NLS residue than they would if discharged following the procedures in the approved Procedures and Arrangements Manual, and no other prewash is required by this part.

§153.1118 Prewash of Categories B and C cargo tanks not meeting stripping standards: Categories B and C.

(a) Unless §153.1114 allows the prewash to be omitted, a cargo tank from which a Category B NLS is unloaded must be prewashed using the procedures in §153.1120(b) if the tank—

(1) Operates under the interim standard in §153.481(b); or

(2) Has a waiver issued under §153.483.

(b) Unless §153.1114 allows the prewash to be omitted, a cargo tank from which a Category C NLS is unloaded must be prewashed using the procedures in §153.1120(b) if the tank has a waiver issued under §153.483.

§153.1119 When to prewash and discharge NLS residues from a prewash; unloading an NLS cargo in a country whose Administration is not signatory to MARPOL 73/78: Categories A, B, and C.

(a) Except as allowed in paragraphs (b), (c), and (e) of this section, each prewash required by this subpart must be completed and all tank washings must be discharged to a reception facility before the ship leaves the unloading port.

(b) NLS residue from the prewash following the unloading of a Category B NLS may be transferred to a slop tank for discharge under §153.1126 instead of being discharged under paragraph (a) of this section if the prewash is required solely under §153.1118(a)(1).

(c) A tank that is required by this part to be prewashed may be prewashed in a port other than the unloading port if the following conditions are met:

(1) The person in charge requests permission from the Commandant (G–

MSO) (tel num; 202–267–1217) if the prewash port is a foreign port, or the Captain of the Port having jurisdiction over the unloading port if the prewash port is a U.S. port.

(2) The person in charge supplies with the request required under paragraph (c)(1) of this section—

(i) The name of the ship;

(ii) The name of the owner;

(iii) The name of the NLS;

(iv) The approximate date the tank will be prewashed if the relocation of the prewash port is for one time only;

(v) A written agreement to receive the tank washings by a reception facility in the prewash port;

(vi) When the prewash port or terminal is in a country whose Administration is signatory to MARPOL 73/78, a written attestation from the person in charge of each prewash port or terminal that the Administration has determined the port or terminal to have adequate reception facilities for the NLS residue;

(vii) Written pledges from the person in charge that—

(A) The tank to be prewashed will not be washed or ballasted before being prewashed; and

(B) The ship will be taken to the reception facility and the tank prewashed in accordance with the requirements in §153.1120; and

(viii) Any additional information the Captain of the Port or Commandant (G–MSO) requests to evaluate granting the permission.

(3) The Coast Guard or Commandant (G–MSO) has granted the permission in writing, the permission is carried aboard the ship, and the person in charge of the ship has made an entry in the Cargo Record Book stating that the permission has been granted.

(d) Unless the permission granted under paragraph (c)(4) of this section includes alternate conditions of termination or revocation in writing, the permission is—

(1) Terminated after the tank is prewashed as pledged in paragraph (c)(3)(vii) of this section or loaded with another cargo;

(2) Revoked if either of the pledges in paragraph (c)(3)(vii) of this section is invalidated or the agreement in paragraph (c)(3)(v) of this section is repudiated; and

(3) Revoked at any time the ship is not operated in accordance with the pledges in paragraph (c)(3)(vii) of this section and the conditions listed with the granted permission.

(e) A U.S. ship that would otherwise be required by this part to prewash in a port without reception facilities must obtain permission from Commandant (G–MSO) to prewash in an alternate port.

§153.1120 Procedures for tank prewash: Categories A, B, and C.

Except where the approved Procedures and Arrangements Manual prescribes a different procedure, each of the following steps must be done in the order listed for the Coast Guard to consider the tanks prewashed under this part:

(a) When this part requires a prewash of a tank containing Category A NLS residue and the alternative prewash procedure in paragraph (b) of this section is not used, the prewash must meet the following:

(1) The prewash may not begin until—

(i) A Surveyor is present; and

(ii) Instrumentation or equipment is available that is capable of measuring the concentration of the Category A NLS in the NLS residue and determining whether it is below 0.1 per cent by weight.

(2) The equipment specified in §153.484 must be used as prescribed in the approved Procedures and Arrangements Manual for the prewash.

(3) The wash water must be heated if required by §153.1108, and water or tank washings must pass through the cargo pump and piping, including any stripping equipment, during washing or during discharge of tank washings.

(4) The tank washing machine must be placed in all positions specified for the tank's Category A NLS prewash procedure in the approved Procedures and Arrangements Manual.

(5) The tank must be pumped out each time there are enough tank washings collected in the bottom of the tank for the pump to gain suction, and if the NLS is immiscible with water or

is a solidifying cargo, all floating and suspended NLS must be discharged.

(6) The washing machine must be operated until samples of the discharged tank washings taken by the Surveyor are tested using the equipment required by paragraph (a)(1)(ii) of this section and the concentration of NLS is below 0.1 per cent by weight.

(7) After the washing is stopped, the remaining tank washings must be pumped out.

(8) The Cargo Record Book must have items 12 through 14 completed and must show the Surveyor's written certification of their accuracy.

(9) The Cargo Record Book must have the Surveyor's written concurrence that the prewash procedures specified in the approved Procedures and Arrangements Manual were followed.

(b) When this part requires a prewash of a tank containing Category B or C NLS residue or when the procedure in this paragraph is used as an alternative to the prewash procedure under paragraph (a) of this section, the prewash must meet the following:

(1) If the prewash is for a Category A NLS, the prewash may not begin until a Surveyor is present.

(2) The equipment specified in §153.484 must be used as prescribed in the approved Procedures and Arrangements Manual for the prewash.

(3) The wash water must be heated if required by §153.1108, and water or tank washings must pass through the cargo pump and piping, including any stripping equipment, during washing or during discharge of tank washings.

(4) Except as required in paragraph (b)(5) of this section, the number of washing machine cycles specified in Table 153.1120 must be completed. If a prewash is required by a section listed under Column 1 of Table 153.1120 and another section listed under Column 2, the number of cycles in Column 1 must be completed but no additional cycles are necessary.

(5) If the approved Procedures and Arrangements Manual specifies that a tank washing machine must be moved for the prewash of a tank from which a Category A NLS or a solidifying NLS has been unloaded, the number of washing machine cycles specified in Table 153.1120 must be completed at each position to which the washing machine is moved.

(6) When the NLS is immiscible with water or is a solidifying cargo, the tank must be pumped out each time enough tank washings collect in the bottom of the tank for the pump to gain suction, or the procedures in paragraphs (b)(3), (b)(4), and (b)(5) of this section must be repeated two additional times with the tank pumped out each time, for a total of three washings.

(7) Items 12 through 14 in the Cargo Record Book must be completed and, if the prewash is for a Category A NLS, verification that the procedures specified in the approved Procedures and Arrangements Manual were followed shown by the Surveyor's endorsement in the Cargo Record Book.

TABLE 153.1120—NUMBER OF WASHING MACHINE CYCLES IN THE PREWASH PROCEDURE

	Number of washing machine cycles	
	Column 1: Prewash under §153.1116 or for a solidifying NLS under §153.1108	Column 2: Prewashes except those listed under column 1
Category A NLS	2	1
Category B or C NLS	1	1/2

[CGD 81–101, 52 FR 7785, Mar. 12, 1987, as amended by CGD 81–101, 53 FR 28975, Aug. 1, 1988 and 54 FR 12629, Mar. 28, 1989]

§153.1122 Discharges of NLS residue from tank washing other than a prewash: Categories A, B, and C.

Tank washings that do not result from a prewash and that contain Category A, B, or C NLS residues must be discharged to a reception facility or

discharged to the sea under § 153.1126 or § 153.1128 except those tank washings resulting from washing a tank that has been cleaned following a ventilation procedure in the approved Procedures and Arrangements Manual.

§ 153.1124 Discharges of Category D NLS residue.

NLS residue from Category D NLSs must be discharged to a reception facility or discharged to the sea using the following procedure:

(a) Before discharge begins, drain or flush the NLS residue in the tank's piping systems into the tank.

(b) After draining or flushing, discharge the NLS residue to the sea in accordance with § 153.1128 or transfer it to a slop tank and discharge in accordance with § 153.1126.

§ 153.1126 Discharge of NLS residue from a slop tank to the sea: Categories A, B, C, and D.

NLS residue in a slop tank may not be discharged into the sea unless—

(a) The ship meets the conditions for discharging the NLS residue from a cargo tank in § 153.1128; and

(b) For Category B NLS residue transferred to the slop tank under § 153.1119(b), the NLS is discharged—

(1) Through an NLS residue discharge system with the flow recording equipment required in § 153.481(b)(2) operating; and

(2) At a rate maintained at or below Q in the following:

For tank contents that are miscible

$$Q = \frac{VKU^{1.4}L^{1.6}}{N} \times 10^{-5}\ m^3/hr$$

For tank contents that are immiscible

$$Q = KU^{1.4}\ L^{1.6} \times 10^{-5}\ m^3/hr$$

where:

Q=maximum permissible slops discharge rate in cubic meters per hour.

V=volume of slops in the tank in cubic meters.

K=4.3, except K=6.45 if Q is distributed between two NLS residue discharge outlets on opposite sides of the ship (see §§ 153.470(c) and 153.481(b)).

U=ship's speed in knots.

L=ship's length in meters.

N=number of tanks containing Category B NLS residue pumped into the slop tank.

§ 153.1128 Discharge of NLS residue from a cargo tank to the sea: Categories A. B, C, and D.

The discharge of NLS residue to the sea must be made with the ship at least 22.24 km (12 nautical miles) from the nearest land, and must meet the following additional conditions:

(a) To discharge the following the ship must be in water at least 25 m (76.2 ft) deep:

(1) Category B or C NLS residue diluted to less than 1 ppm of the NLS.

(2) Category B or C NLS residue resulting from washing a tank after the following washing procedure has been completed:

(i) If the tank is not required to be prewashed under this part, the tank must be washed following the procedures that apply to a prewash of a Category B NLS in § 153.1120 using one washing machine cycle, and the tank washings discharged to a reception facility or to the sea under § 153.1126 or paragraph (a)(1), (c) or (d) of this section.

(ii) After the tank has been prewashed or has been washed under paragraph (a)(2)(i) of this section, the tank must then be washed with one cycle of the tank washing machine, and the tank washings discharged to a reception facility or to the sea in accordance with § 153.1126 or paragraph (a)(1), (c), or (d) of this section.

(b) To discharge a Category D NLS residue to which 10 times its volume in water is added and mixed, the ship must be—

(1) If self-propelled, maintained at a speed of at least 12.97 km/hr (7 knots); and

(2) If not self-propelled, maintained at a speed of at least 7.41 km/hr (4 knots).

(c) Each ship built before July 1, 1986 that discharges Category A, B or C NLS residues before January 1, 1988 must be—

(1) In water at least 25 m (76.2 ft) deep;

(2) If discharging the residue of a Category A NLS cargo, discharging only residue created by washing the Category A NLS's cargo tank after a prewash;

(3) If discharging the residue of a Category B NLS cargo, discharging no

more than the larger of 1 m^3 or 1/3000th the volume of the Category B cargo loaded;

(4) If discharging the residue of a Category C NLS cargo, discharging no more than the larger of 3 m^3 of or

1/1000th the volume of the Category C cargo loaded;

(5) If self-propelled, maintained at a speed of at least 12.97 km/hr (7 knots); and

(6) If not self-propelled, maintained at a speed of at least 7.41 km/hr (4 knots).

(d) To discharge Category A, B, C, or D NLS residue other than as allowed under paragraphs (a) through (c) of this section, the ship must be—

(1) In water at least 25 m (76.2 ft) deep;

(2) Discharging at a rate not exceeding that used for Q_d in §153.470;

(3) If self-propelled, maintained at speed no less than the minimum specified in the approved Procedures and Arrangements Manual but at least 12.97 km/hr (7 knots);

(4) If not self-propelled, maintained at a speed no less than the minimum specified in the approved Procedures and Arrangements Manual but at least 7.41 km/hr (4 knots);

(5) If discharging the residue of a Category A NLS cargo, discharging only residue created by washing the Category A NLS's cargo tank after a prewash;

(6) If discharging the residue of a Category B NLS cargo, discharging no more than the larger of 1 m^3 or 1/3000th the volume of the Category B cargo loaded;

(7) If discharging the residue of a Category C NLS cargo, discharging no more than the larger of 3 m^3 of or

1/1000th the volume of the Category C cargo loaded;

(8) Discharging through an NLS residue discharge system meeting §153.470.

[CGD 81–101, 52 FR 7785, Mar. 12, 1987, as amended by CGD 81–101, 53 FR 28976, Aug. 1, 1988 and 54 FR 12629, Mar. 28, 1989]

§153.1130 Failure of slops discharge recording equipment; operating with, reporting failures, and replacing pollution equipment: Category A, B, C, D.

(a) If equipment required in §§153.470 through 153.488 fails, the Coast Guard Marine Inspection Office, Marine Safety Office, or Captain of the Port must be notified within 24 hours after the failure.

(b) No person shall replace a piece of equipment required by §§153.470 through 153.488 unless the replacement is—

(1) Identical to the original equipment; or

(2) Allowed as an alternative under §153.10.

(c) The following conditions apply when discharge recording equipment required under §153.481(b)(2) fails:

(1) No NLS residue may be discharged unless the approved Procedures and Arrangements Manual contains procedures for discharging with incapacitated discharge recording equipment while meeting the discharge restrictions of §153.1126(b) and these procedures are followed.

(2) The failure of the discharge recording equipment must be recorded in the Cargo Record Book within 24 hours after the failure.

(3) If the ship operates under a Certificate of Inspection, the failed discharge recording equipment must be repaired or replaced within 60 days after it fails, and the repair or replacement recorded in the Cargo Record Book and reported to the Coast Guard within 24 hours after it is completed.

§153.1132 Reporting spills and noncomplying discharges: Category A, B, C, and D.

The following shall be reported following the procedures applying to oil in 33 CFR 151.15 (c), (d), (g), (h):

(a) All discharges of the NLS that do not meet the requirements of this part.

(b) All spills into the water.

MAINTENANCE

§ 153.1500 Venting system rupture disks.

The master shall ensure that a relief valve exposed to a cargo after the failure of a rupture disk or breaking pin is cleaned and operates properly before the next cargo is loaded into the tank.

§ 153.1502 Fixed ballast relocation.

No person may remove or relocate fixed ballast unless:

(a) The change is approved by the Commandant (G–MSO); or

(b) The ballast is temporarily moved under the supervision of a Coast Guard Marine Inspector for examination or repair of the tankship.

[CGD 73–96, 42 FR 49027, Sept. 26, 1977, as amended by CGD 82–063b, 48 FR 4782, Feb. 3, 1983]

§ 153.1504 Inspection of personnel emergency and safety equipment.

The master shall ensure that the personnel emergency and safety equipment required by § 153.214 is inspected each 30 days and found to be in good condition and operating properly.

Subpart D—Test and Calculation Procedures for Determining Stripping Quantity, Clingage NLS Residue, and Total NLS Residue

SOURCE: CGD 81–101, 52 FR 7788, Mar. 12, 1987, unless otherwise noted.

§ 153.1600 Equipment required for conducting the stripping quantity test.

The operator shall ensure the stripping quantity test is conducted with—

(a) Equipment that maintains a backpressure of at least 100 kPa (1 atm) (gauge) at the connection of the discharge line of the tank to be tested to the cargo transfer hose, including, but not limited to, piping whose discharge is 10 m above the manifold or a constant pressure valve in the discharge line and set at 100 kPa;

(b) A container for measuring the volume of water remaining in the tank to an accuracy of ± 5%;

(c) A squeegee or broom to collect standing water on the tank floor;

(d) One or more containers for collecting and transferring water; and

(e) One of the following for transferring the water remaining in the tank to the measuring container:

(1) A wet vacuum.

(2) A positive displacement pump.

(3) An eductor with an air/water separator in line.

§ 153.1602 Test procedure for determining the strippinq quantity.

(a) The stripping quantity of a tank must be determined by testing the tank under the procedures in paragraph (b) of this section unless the Coast Guard agrees under the provisions of § 153.10 to accept the stripping quantity, previously determined under paragraph (b) of this section, of a tank having similar geometry, internal structure, and piping system.

(b) When testing a tank for stripping quantity, the owner or operator of the ship shall proceed as follows:

(1) Make arrangements with the Officer in Charge, Marine Inspection, for a Coast Guard Marine Inspector to witness the stripping test.

(2) Clean and gas free the tanks to be tested.

(3) Determine the least favorable values of list and trim for drainage within the range allowed by the approved Procedures and Arrangements Manual.

(4) Maintain the ship's list and trim during the test to that determined under paragraph (b)(3) of this section.

(5) Load the tank with enough water so that unloading the water simulates the final stages of unloading a full tank of cargo.

(6) Pump out the water and strip the tank using the procedures specified in the approved Procedures and Arrangements Manual.

(7) After shutting the manifold valve, open any cargo pump foot valve to allow water trapped in the cargo pump to drain into the tank.

(8) Open all valves in the piping system except the manifold valve and allow the water to drain into the tank.

(9) Squeegee or sweep the water drained under paragraphs (b)(7) and (b)(8) of this section and any water that stands in puddles on the tank floor to the tank's low point or sump and collect in the container required

by §153.1600(b) using the equipment required in §153.1600(e).

(10) With the manifold valve still closed, drain any water remaining in the piping system on the ship's side of the cargo transfer manifold valve into containers, and add this water to that collected from the tank under paragraph (b)(9) of this section. Water collected from a cargo line serving a block of tanks may be prorated between all the tanks it serves if—

(i) The ship owner requests, under the provisions of §153.10, that the water be prorated; and

(ii) The ship's approved Procedures and Arrangements Manual specifies that no tank in the block be washed until all the tanks in the block have been discharged.

(c) Include any water that is trapped in dead end pipe sections, either by—

(1) Draining the pipe sections and adding the water to that collected in the container under paragraphs (b)(9) and (b)(10) of this section; or

(2) Adding an estimate of the water's volume to the sum calculated in paragraph (d) of this section using the pipe's dimensions, the ship's list and trim, and the geometry of the piping system.

(d) Measure the volume of water collected in the container under paragraphs (b)(9), (b)(10), and (c)(1) of this section and add to that volume the volume, if any, estimated under paragraph (c)(2) of this section.

§153.1604 Determining the stripping quantity from the test results.

(a) For a single test, the stripping quantity is the volume of water calculated under §153.1602(d).

(b) If multiple tests are made on a tank without modifications to the tank, pumping system, or stripping procedure between the tests, the stripping quantity must be taken as the average of the stripping quantities for all of the tests.

(c) If multiple tests are made on a tank with modifications to the tank, pumping system, or stripping procedure between the tests, the stripping quantity is the stripping quantity determined under paragraph (b) of this section using only those tests performed after the last modification.

§153.1608 Calculation of total NLS residue and clingage NLS residue.

(a) The total NLS residue for each tank is calculated by adding the stripping quantity and the clingage NLS residue.

(b) The clingage NLS residue for each tank is calculated using the following formula:

$$Q_{clingage} = 1.1\times10^{-4}\ A_d + 1.5\times10^{-5}\ A_w + 4.5\times10^{-4}\ L^{1/2}\ A_b$$

where:

A_b = Area of the tank bottom added to the area in square meters of tank structural components projected on a horizontal surface

A_d = Area of the tank underdecks added to the area in square meters of tank structural components projected on a horizontal surface

A_w = Area of the tank walls added to the area in square meters of tank structural components projected on a vertical surface

L = Length of tank in meters from fore to aft

$Q_{clingage}$ = volume of clingage in cubic meters

When using the formula in this paragraph, areas that are inclined more than 30° from the horizontal may be assumed to be vertical.

NOTE: The Commandant (G–MSO) (tel num;202–267–1217) has information that may be useful in approximating surface areas of typical structural members for the projected area calculations under §153.1608(b).

TABLE 1.—SUMMARY OF MINIMUM REQUIREMENTS

Cargo name	IMO Annex II pollution category	Haz.	Cargo containment system	Ventheight	Vent	Gauge	Fire protection system	Special requirements in 46 CFR Part 153	Electrical hazard class and group
a.	b.	c.	d.	e.	f.	g.	h.	i.	j.
Acetic acid	D	S	III	4m	PV	Restr	A	.238(a), **.409**, .527, .554	I–D
Acetic anhydride	D	S	II	4m	PV	Restr	A	.238(a), **.409** .526, .527, .554	I–D
Acetochlor	A	P	II	NR	Open	Open	A	.409	NA
Acetone cyanohydrin	A	S/P	II	B/3	PV	Closed	A	.238(a), .316, .336, .408, .525, .526, .527, .912(a)(2), .933, .1002, .1004, .1020, .1035.	I–D
Acetonitrile	III	S	II	B/3	PV	Restr	A	**.409**, 525, .526, .1020	I–D
Acrylamide solution (50% or less)	D	S	II	NR	Open	Closed	NSR	.409, .525(a), (c), (d), (e), .912(a)(1), .1002(a), .1004, .1020.	NA
•Acrylic acid	D	S	III	4m	PV	Restr	A	.238(a), **.409**, .526, .912(a)(1), **.933**, .1002(a), .1004	I–D
Acrylonitrile	B	S/P	II	B/3	PV	Closed	A	.236(a), (c), (d), .316, .408, .525, .526, .527, .912(a)(1), .1004, .1020.	I–D
Adiponitrile	D	S	III	4m	PV	Restr	A	.526	I–D
Alachlor technical (90% or more)	B	S/P	III	NR	Open	Open	A, C	.238(a), .409, .440, .488, .908(a), (b)	NA
Alcohol (C6–C17) (secondary) poly(3–6)ethoxylates.	A	P	II	NR	Open	Open	A	.409	NA
Alcohol (C6–C17) (secondary) poly(7–12)-ethoxylates.	B	P	III	NR	Open	Open	A	.409, .440, .908(a), (b)	NA
•Alcohol(C12–C15) poly(1–3)ethoxylates, *see* **Alcohol(C12–C15) poly(1–6)ethoxylates**.									
•Alcohol(C12–C15) poly(3–11)ethoxylates, *see* **Alcohol(C12–C15) poly(1–6)** *or* **poly(7–19)ethoxylates**.									
Alcohol(C12–C15) poly(1–6)ethoxylates	A	P	II	NR	Open	Open	A	.409	NA
Alcohol(C12–C15) poly(7–19)ethoxylates	B	P	III	NR	Open	Open	A	.409, **.440**, .908(a)	NA
Alcohol(C12–C15) poly(20+)ethoxylates	C	P	III	NR	Open	Open	A	None	NA
Alkanes(C6–C9) (*all isomers*)	C	P	III	4m	PV	Restr	A	.409	I–D
Alkane(C14–C17) sulfonic acid, sodium salt solution (65% or less).	B	P	III	NR	Open	Open	NSR	.440, .908(a)	NA
Alkaryl polyether (C9–C20)	B	P	III	NR	Open	Open	A, B	.409; (**.440, .908(a)**) [1]	NA
Alkyl acrylate-Vinyl pyridine copolymer in Toluene.	C	P	III	4m	PV	Restr	A	.409	NA
Alkyl(C3–C4)benzenes (*all isomers*)	A	P	III	4m	PV	Restr	A	.409	I–D
Alkyl(C5–C8)benzenes (*all isomers*)	A	P	II	NR	Open	Open	A	.409	I–D
•**Alkylbenzene, Alkylindane, Alkylindene mixture (each C12–C17)**.	A	P	II	NR	Open	Open	A	.409	NA
Alkylbenzenesulfonic acid *(greater than 4%)*.	C	S/P	III	NR	Open	Open	A, B	.440, .908(a)	NA
Alkylbenzenesulfonic acid, sodium salt solution.	C	P	III	NR	Open	Open	NSR	.440, .903, .908(a), (b)	NA
Alkyl(C7–C9) nitrates	A	S/P	II	NR	Open	Open	A, B	.409, .560, .1002	NA

Alkyl (C7-C12) phenol poly(4-12) ethoxylate.	B	P	III	NR	Open	Open	A	.409, .440, .488[1], .908 (a), (b)	I–D
Allyl alcohol	B	S/P	II	B/3	PV	Closed	A	.316, .408, .525, .526, .527, .933, .1020	I–C
Allyl chloride	B	S/P	II	B/3	PV	Closed	A	.316, .408, .525, .526, .527, .1020	I–D
Aluminum chloride (30% or less), Hydrochloric acid (20% or less) solution.	D	S	III	4m	PV	Restr	NSR	.252, .526, .527, .554, .557, .933, .1045, .1052	I–B
2-(2-Aminoethoxy) ethanol	D	S	III	NR	Open	Open	A, C, D	.236(b), (c), .409	NA
Aminoethylethanolamine	D	S	III	NR	Open	Open	A	.236(a), (b), (c), (g)	NA
N-Aminoethylpiperazine	D	S	III	4m	PV	Restr	A	.236(b), (c), .409, .526	I–C
2-Amino-2-methyl-1-propanol (90% or less).	D	S	III	NR	Open	Open	A	.236(a), (b), (c), (g)	I–D
Ammonia aqueous (28% or less), *see* Ammonium hydroxide (28% or less NH_3).									
Ammonium bisulfite solution (70% or less).	D	S	III	4m	PV	Restr	No	.238(e), .933, .1002	NA
Ammonium hydroxide (28% or less NH_3)	C	S/P	III	4m	PV	Restr	A, B, C	.236(b), (c), (f), .526, .527	I–D
Ammonium nitrate solution (greater than 45% and less than 93%).	D	S	II	NR	Open	Open	NSR	.238(d), .252, .336, .409, .554(a), (b)	NA
•Ammonium sulfide solution (45% or less).	**C**	S/P	II	B/3	PV	Closed	A, C	**.236(a), (b), (c), (g), .316, .408, .525, .526, .527, .933, .1002, .1020**.	I–D
Ammonium thiocyanate (25% or less), Ammonium thiosulfate (20% or less) solution.	C	P	III	NR	Open	Open	NSR	None	NA
Ammonium thiosulfate solution (60% or less).	C	P	III	NR	Open	Open	NSR	.440, .908(b)	NA
•(commercial, iso-, n-, sec-) Amyl acetate, *see* **Amyl acetate (all isomers)**.									
Amyl acetate (all isomers)	C	P	III	4m	PV	Restr	A	.409	I–D
Aniline	C	S/P	II	B/3	PV	Closed	A	.316, .408, .525, .526, .933, .1020	I–D
Anthracene oil (Coal tar fraction), *see* Coal tar.									
Aviation alkylates *(C8 paraffins and isoparaffins, b. pt. 95–120 deg. C).*	C	P	III	4m	PV	Restr	B	.409	I–C
Barium long chain alkaryl sulfonate (C11–C50).	[B]	P	III	NR	Open	Open	A	.409; (.440, .903, .908(a))[1]	NA
Barium long chain alkyl (C8–C14) phenate sulfide.	[A]	P	II	NR	Open	Open	A	.409	NA
Benzene hydrocarbon mixtures[2] *(having 10% Benzene or more).*	C[2]	S/P	III	B/3	PV	**Closed**	A,B	.316, **.409**, .440, .526, .908(b), .933, .1060	I–D
Benzenesulfonyl chloride	D	S	III	4m	PV	Restr	A, B, D	.236(a), (b), (c), (g), .409, .526	I–D
Benzene, Toluene, Xylene mixtures[2] *(having 10% Benzene or more).*	@C[2]	S/P	III	B/3	PV	**Closed**	B	.316, **.409** .440, .526, .908(b), .1060	I–D
Benzyl acetate	C	P	III	NR	Open	Open	A	None	I–D
Benzyl alcohol	C	P	III	NR	Open	Open	A	None	I–D
Benzyl chloride	B	S/P	II	B/3	PV	Closed	A, B	.316, .408, .525, .526, .527, .912(a)(2), .1004, .1020	I–D
Bromochloromethane	D	S	III	4m	PV	Restr	No	.236 (a), (b), (d), .526, .933	NA
Butene oligomer	B	P	III	NR	Open	Open	A	**.409**	NA
(iso-, n-) Butyl acetate, *see* **Butyl acetate (all isomers)**.									

TABLE 1.—SUMMARY OF MINIMUM REQUIREMENTS—Continued

Cargo name	IMO Annex II pollution category	Haz.	Cargo containment system	Ventheight	Vent	Gauge	Fire protection system	Special requirements in 46 CFR Part 153	Electrical hazard class and group
a.	b.	c.	d.	e.	f.	g.	h.	i.	j.
Butyl acetate (all isomers)	C	P	III	4m	PV	Restr	A	.409	I–D
(iso-, n-) Butyl acrylate, *see* **Butyl acrylate (all isomers)**.									
Butyl acrylate (all isomers)	**B**	S/P	II	4m	PV	Restr	A	.409, .526, .912(a)(1), .1002(a), (b), .1004	I–D7
Butylamine (all isomers)	C	S/P	II	B/3	PV	Restr	A	.236(b), (c), .316, .408, .525, .526, .527, .1020	I–D
Butylbenzene (all isomers)	A	P	III	4m	PV	Restr	A	.409	I–D
Butyl benzyl phthalate	A	P	II	NR	Open	Open	A	.409	I–D
n-Butyl butyrate, *see* **Butyl butyrate (all isomers)**.									
Butyl butyrate (all isomers)	**B**	P	III	4m	PV	Restr	A	.409	I–D
1,2-Butylene oxide	C	S/P	III	4m	PV	Restr	A, C	.372, .409, .440, .500, .526, .530(a), (c), (e)–(g), (m)–(o), .1010, .1011.	I–B
n-Butyl ether	C	S/P	III	B/3	PV	Restr	A, D	**.409**, .500, .525, .526, .1020	I–C
Butyl heptyl ketone	[C]	P	III	NR	Open	Open	A	None	NA
iso-Butyl isobutyrate, *see* **Butyl butyrate (all isomers)**.									
Butyl methacrylate	D	S	III	4m	PV	Restr	A, D	**.409**, .526, .912(a)(1), .1002(a), (b), .1004	I–D
Butyl methacrylate, Decyl methacrylate, Cetyl-Eicosyl methacrylate mixture.	D	S	III	4m	PV	Restr	A, C, D	.912(a)(1), .1002(a), (b), .1004	I–D
n–Butyl propionate	C	P	III	4m	PV	Restr	A	.409	I–D
Butyl toluene	@A	P	II	NR	Open	Open	A	.409	I–D
•iso-Butyraldehyde, *see* **Butyraldehyde (all isomers)**.									
•n-Butyraldehyde, *see* **Butyraldehyde (all isomers)**.									
Butyraldehyde (all isomers)	**C**	S/P	III	4m	PV	**Restr**	A	**.409,** .526	I–C
Butyric acid	D	S	III	4m	PV	Restr	A	.238(a), .554	I–D
Calcium alkyl(C9)phenol sulfide, polyolefin phosphorosulfide mixture.	A	P	II	NR	Open	Open	A, B	.409	NA
•Calcium alkyl salicylate, *see* **Calcium long chain alkyl salicylate (C13+)**.									
•*Calcium bromide, Zinc bromide solution, see* Drilling brine (containing Zinc salts).									
Calcium hypochlorite solution (15% or less).	C	S/P	III	4m	PV	Restr	NSR	**.236(a), (b)**	NA
Calcium hypochlorite solution (more than 15%).	B	S/P	III	4m	PV	Restr	NSR	**.236 (a), (b), .409**	NA
Calcium long chain alkyl salicylate (C13+).	C	P	III	NR	Open	Open	A, B	(.440, .903, .908(a))[1]	NA

Camphor oil	B	S/P	II	4m	PV	Restr	A, B	.409	I–D
Carbolic oil	A	S/P	II	B/3	PV	Closed	A	.408, .440, .525, .526, .908(b), .933, .1020	NA
Carbon disulfide	B	S/P	II	B/3	PV	Closed	C	.236(c), .252, .408, .500, .515, .520, .525, .526, .527, .1020, .1040.	I–A
Carbon tetrachloride	B	S/P	III	B/3	PV	Closed	NSR	.316, .409, .525, .526, .527, .1020	NA
Cashew nut shell oil (untreated)	D	S	III	4m	PV	Restr	A, B	.526, .933	NA
•Caustic potash solution	**D**	**S**	III	NR	Open	Open	NSR	**.236(a), (c), (g), .933**	NA
Caustic soda solution	D	S	III	NR	Open	Open	NSR	.236(a), (c), (g), .933	NA
Cetyl-Eicosyl methacrylate mixture	III	S	III	NR	Open	Open	A, C, D	.912(a)(1), .1002(a), (b), .1004	NA
Chlorinated paraffins (C10–C13)	A	P	I	NR	Open	Open	A	.408	NA
Chloroacetic acid (80% or less)	C	S/P	II	B/3	PV	Closed	NSR	.238(e), .408, .440, .554, .908(b)	I–D
•Chlorobenzene	B	S/P	**III**	4m	PV	Restr	A, B	.409, .526	I–D
Chloroform	B	S/P	III	B/3	PV	Restr	NSR	.409, .525, .526, .527, .1020	NA
(crude) Chlorohydrins	D	S	II	B/3	PV	Closed	A	.408, .525, .526, .1020	I–D
•4-Chloro-2-methylphenoxyacetic acid, dimethylamine salt solution.	**C**	P	III	NR	Open	Open	NSR	.236(a), (b), (c), (g)	NA
•o-Chloronitrobenzene	B	S/P	II	B/3	PV	Closed	A, B, C, D	.316, .336, .408, .440, .525, .526, .908(a), (b), **.933**, .1020.	NA
2- or 3-Chloropropionic acid	C	S/P	III	NR	Open	Open	A	.238(a), (b), .440, .554, .908(a), (b)	NA
Chlorosulfonic acid	C	S/P	I	B/3	PV	Closed	NSR	.408, .525, .526, .527, .554, .555, .602, .933, .1000, .1020, .1045.	I–B
o-Chlorotoluene	A	S/P	III	4m	PV	Restr	A, B, C	.409, .526	I–D
m-Chlorotoluene	B	S/P	III	4m	PV	Restr	A, B, C	.409, .526	I–D
p-Chlorotoluene	B	S/P	II	4m	PV	Restr	A, B, C	.409, .440, .526, .908(b)	I–D
Chlorotoluenes (mixed isomers)	A	S/P	II	4m	PV	Restr	A, B, C	.409, .526	I–D
Coal tar	A	S/P	II	4m	PV	Restr	B, D	.409, .933, .1060	I–D
Coal tar naphtha solvent	B	S/P	III	4m	PV	Restr	A, D	.409, .526, .933, .1060	I–D
Coal tar pitch (molten)	D	S	III	4m	PV	Restr	B, D	.252, .409, .933, .1060	I–D
Cobalt naphthenate in solvent naphtha	A	S/P	II	4m	PV	Restr	A, D	.409, .526	I–D
Coconut oil, fatty acid	C	P	III	NR	Open	Open	A	.440, .903, .908(a), (b)	NA
Cottonseed oil, fatty acid	[C]	P	III	NR	Open	Open	A	.440, .903, .908(a)	NA
Creosote (coal tar)	A	S/P	II	NR	Open	Open	A, B, D	.409	I–D
Creosote (wood)	A	S/P	II	NR	Open	Open	A, B, D	.409	NA
Cresols (all isomers)	A	S/P	II	NR	Open	Open	A, B	.409, .440, .908(b)	I–D
Cresols with less than 5% Phenol, see Cresols (all isomers)									
Cresols with 5% or more Phenol, see Phenol									
Cresylate spent caustic *(mixtures of Cresols and Caustic soda solutions).*	A	S/P	II	NR	Open	Open	NSR	.236(a), (c), **.409**, .933	NA
Cresylic acid, dephenolized	A	S/P	II	NR	Open	Open	A, B	.409	NA
Cresylic acid, sodium salt solution, *see* Cresylate spent caustic.									
Crotonaldehyde	**A**	S/P	II	B/3	PV	Restr	A	.316, .409, .525, .526, .527, .1020	I–C
Cumene *(isopropylbenzene), see* **Propylbenzene (all isomers)**.									
•1,5,9-Cyclododecatriene	**A**	S/P	**I**	4m	PV	Restr	A	.236(b), (c), **.408**, .526, .912(a)(1), .1002(a), (b), .1004.	I–D
Cycloheptane	C	P	III	4m	PV	Restr	A	.409	I–D
Cyclohexane	C	P	III	4m	PV	Restr	A	.409, .440, .908(b)	I–D

TABLE 1.—SUMMARY OF MINIMUM REQUIREMENTS—Continued

Cargo name	IMO Annex II pollution category	Haz.	Cargo containment system	Ventheight	Vent	Gauge	Fire protection system	Special requirements in 46 CFR Part 153	Electrical hazard class and group
a.	b.	c.	d.	e.	f.	g.	h.	i.	j.
Cyclohexanone	D	S	III	4m	PV	Restr	A	.236(a), (b), **.409,** .526	I–D
•Cyclohexanone, Cyclohexanol mixture	**D**	**S**	III	4m	PV	Restr	A	.236(a), (b), .526	I–D
Cyclohexyl acetate	B	P	III	4m	PV	Restr	A	.409	I–D
Cyclohexylamine	C	S/P	III	4m	PV	Restr	A, C, D	.236(a), (b), (c), (g), **.409**, .526	I–D
1,3-Cyclopentadiene dimer (molten)	B	P	II	4m	PV	Restr	A	.409, .440, .488, .908(a), (b)	I–C
Cyclopentane	C	P	III	4m	PV	Restr	A	.409	I–D
Cyclopentene	B	P	III	4m	PV	Restr	A	.409	I–D
p-Cymene	C	P	III	4m	PV	Restr	A	.409	I–D
iso-Decaldehyde	@C	P	III	NR	Open	Open	A	None	I–C
n-Decaldehyde	@B	P	III	NR	Open	Open	A	None	I–C
Decanoic acid	C	P	III	NR	Open	Open	A	.440, .903, .908(a), (b)	NA
Decene	B	P	III	4m	PV	Restr	A	.409	I–D
Decyl acetate	B	P	III	NR	Open	Open	A	.409	NA
(iso-, n-) Decyl acrylate	A	S/P	II	NR	Open	Open	A, C, D	.236(a), (b), (c), .409, .912(a)(1), .1002(a), (b), .1004	I–D
Decyl alcohol (all isomers)	B	P	III	NR	Open	Open	A	.409, .440, .908(b)	I–D
Decyloxytetrahydro-thiophene dioxide	A	S/P	II	B/3	PV	Restr	A	.409, **.526**	NA
Dibromomethane	C	S/P	II	4m	PV	Restr	No	.236 (a), (b), (d), .408, .525 (a), (c), (d), (e), .526, .933, .1020.	NA
Dibutylamine	C	S/P	III	4m	PV	Restr	A, B, C, D	.236(b), (c), **.409**, .526	I–C
Dibutyl hydrogen phosphonate	B	P	III	NR	Open	Open	A	.409, .440, .908(a)	NA
•*ortho*-Dibutyl phthalate	A	P	II	NR	Open	Open	A	.409	I–D
•Dichlorobenzene (all isomers)[1]	**B**	**S/P**	II	4m	PV	Restr	A, B, D	.236(a), (b), .409, .440, .488[1], .526, .908(a), (b)[1]	I–D
3,4-Dichloro-1-butene	B	S/P	III	B/3	PV	Closed	A, B, C	.316, .409, .525 (a), (c), (d), (e), .526, .527, .933, .1020.	I–D
•1,1-Dichloroethane	**D**	S	III	4m	PV	Restr	A, B	.409, .526, .527	I–D
2,2'-Dichloroethyl ether	B	S/P	II	4m	PV	Restr	A	.236(a), (b), .409, .526	I–C
1,6–Dichlorohexane	B	S/P	II	4m	PV	Restr	A, B	.409, .526	NA
2,2'-Dichloroisopropyl ether	C	S/P	II	B/3	PV	Restr	A, B, C, D	.236(a), (b), .316, .408(a), .440, .525, .526, .1020	I–D
Dichloromethane	D	S	III	4m	PV	Restr	NSR	.526	I–D
2,4-Dichlorophenol[4]	A	S/P	II	4m	PV	Restr	A, B, C, D	.236(a), (b), (c), (g), .409, .440, .500, .501, .526, .908(b), .933.	I–D
2,4-Dichlorophenoxyacetic acid, diethanolamine salt solution.	A	S/P	III	NR	Open	Open	NSR	**.236(a), (b), (c), (g), .409**	NA
2,4-Dichlorophenoxyacetic acid, dimethylamine salt solution.	A	S/P	III	NR	Open	Open	NSR	**.236(a), (b), (c), (g),** .409	NA
2,4-Dichlorophenoxyacetic acid, triisopropanolamine salt solution.	A	S/P	III	NR	Open	Open	NSR	**.236(a), (b), (c), (g),** .409	NA

•1,1-, 1,2-, or 1,3-Dichloropropane, *see individual entries.*									
1,1-Dichloropropane	**C**	S/P	II	B/3	PV	Restr	A, B	**.409,** .525, .526, .1020	I–D
1,2-Dichloropropane	**C**	S/P	II	B/3	PV	Restr	A, B	**.409,** .525, .526, .1020	I–D
1,3-Dichloropropane	**D**	S	II	B/3	PV	Restr	A, B	**.409,** .525, .526, .1020	I–D
1,3-Dichloropropene	B	S/P	II	B/3	PV	Closed	A, B	.316, .336, .408, .525, .526, .527, .1020	I–D
Dichloropropene, Dichloropropane mixtures.	B	S/P	II	B/3	PV	Closed	A, B, C, D	.316, .336, .408, .526, .527	I–D
•2,2-Dichloropropionic acid	D	S	III	4m	PV	Restr	A	.238(e), .266, .500, .501, .554, **.933**	NA
Diethanolamine	**D**	S	III	NR	Open	Open	A	.236(b), (c)	NA
Diethylamine	C	S/P	III	B/3	PV	Restr	A	.236(a), (b), (c), (g), **.409,** .525, .526, .527, .1020	I–C
Diethylaminoethanol, *see* Diethylethanolamine									
•2,6-Diethylaniline	**C**	S/P	III	NR	Open	Open	B, C, D	.236(b), .409, .440, .908(b)	NA
Diethylbenzene	**A**	P	III	4m	PV	Restr	A	.409	I–D
Diethylenetriamine	D	S	III	NR	Open	Open	A	.236(b), (c)	NA
Diethylethanolamine	C	S/P	III	4m	PV	Restr	A, C	.236(a), (b), (c), (g), **.409**, .526	I–C
Diethyl ether, *see* Ethyl ether									
Di-(2-ethylhexyl) phosphoric acid	C	S/P	III	NR	Open	Open	A, B, C, D	.236(b), (c)	I–D
Diethyl phthalate	C	P	III	NR	Open	Open	A	None	I–D
Diethyl sulfate	B	S/P	II	4m	PV	Closed	A, D	.236(a), (c), (d), **.409,** .526	I–D
Diglycidyl ether of Bisphenol A	B	P	III	NR	Open	Open	A	.409, .440, .908(a)	NA
Diglycidyl ether of Bisphenol F	B	P	III	NR	Open	Open	A	.409, .440, .908(a)	NA
Di-n-hexyl adipate	B	P	III	NR	Open	Open	A	.409	NA
Diisobutylamine	C	S/P	II	4m	PV	Restr	A, B, C, D	.236(a), (b), (c), (g), .409, .525(a), (c), (d), (e), .526, .1020.	I–C
Diisobutylcarbinol	@C	P	III	NR	Open	Open	A	None	I–D
Diisobutylene	B	P	III	4m	PV	Restr	A	.409	I–D
Diisobutyl phthalate	B	P	III	NR	Open	Open	A	.409, .440, .908(a)	I–D
Diisopropanolamine	C	S/P	III	NR	Open	Open	A	.236(b), (c), .440, .908(a), (b)	I–D
Diisopropylamine	C	S/P	II	B/3	PV	Closed	A	.236(b), (c), .408, .525, .526, .527, .1020	I–C
Diisopropylbenzene (all isomers)	A	P	II	NR	Open	Open	A	.409	I–D
N,N-Dimethylacetamide	D	S	III	B/3	PV	Restr	B	.236(b), .316, .525, .526, .527, .1020	I–D
N,N-Dimethylacetamide solution (40% or less).	D	S	III	B/3	PV	Restr	B	.236(b), .316, .526	I–D
Dimethyl adipate	B	P	III	NR	Open	Open	A	.409, .440, .908(b)	NA
Dimethylamine solution (45% or less)	C	S/P	III	B/3	PV	Restr	A, C, D	.236(a), (b), (c), (g), **.409** .525, .526, .527, .1020	I–C
Dimethylamine solution (over 45% but not over 55%).	C	S/P	II	B/3	PV	Closed	A, C, D	.236(a), (b), (c), (g), .316, .408, .525, .526, .527, .1020.	I–C
Dimethylamine solution (over 55% but not over 65%).	C	S/P	II	B/3	PV	Closed	A, C, D	.236(a), (b), (c), (g), .316, .372, .408, .525, .526, .527, .1020.	I–C
2,6-Dimethylaniline	[C]	S/P	III	NR	Open	Open	B, C, D	.236(b), .409, .440, .908(b)	I–D
N,N-Dimethylcyclohexylamine	C	S/P	II	B/3	PV	Restr	A, C	.236(a), (b), (c), (g), .316, .409, .525, .526, .527, .1020.	NA
Dimethylethanolamine	D	S	III	4m	PV	Restr	A, D	.236(b), (c), **.409**, .526	I–C
Dimethylformamide	D	S	III	4m	PV	Restr	A, D	.236(b), **.409**, .526	I–D
Dimethyl glutarate	C	P	III	NR	Open	Open	A	None	NA
•Dimethyl hydrogen phosphite	**B**	**S/P**	III	4m	PV	Restr	A, D	.526	NA
Dimethyl naphthalene sulfonic acid, sodium salt solution.	[A]	P	III	NR	Open	Open	NSR	**.409**	NA

TABLE 1.—SUMMARY OF MINIMUM REQUIREMENTS—Continued

Cargo name	IMO Annex II pollution category	Haz.	Cargo containment system	Ventheight	Vent	Gauge	Fire protection system	Special requirements in 46 CFR Part 153	Electrical hazard class and group
a.	b.	c.	d.	e.	f.	g.	h.	i.	j.
Dimethyloctanoic acid	C	P	III	NR	Open	Open	A	.440, .903, .908(b)	I–D
Dimethyl phthalate	C	P	III	NR	Open	Open	A	None	I–D
Dimethyl succinate	C	P	III	NR	Open	Open	A	.440, .908(b)	NA
Dinitrotoluene (molten)	A	S/P	II	B/3	PV	Closed	A	.316, .408, .525, .526, .527, .1003, .1020,	I–C
1,4-Dioxane	D	S	II	B/3	PV	Closed	A	.408, .525, .526, .1020	I–C
Dipentene	C	P	III	4m	PV	Restr	A	.409	I–D
Diphenyl	A	P	I	NR	Open	Open	B	.408	I–D
Diphenylamines, alkylated	A	P	II	NR	Open	Open	A	.409	NA
Diphenylamine, reaction product with 2,2,4–Trimethylpentene.	A	S/P	I	NR	Open	Open	A	.408	NA
Diphenyl, Diphenyl ether mixtures	A	P	I	NR	Open	Open	B	.408	I–D
Diphenyl ether	A	P	III	NR	Open	Open	A	.409	I–D
Diphenyl ether, Biphenyl phenyl ether mixture.	A	P	III	NR	Open	Open	A, B	.409	NA
Diphenylmethane diisocyanate[6]	B	S/P	II	B/3	PV	Closed	A, B, C[6], D	.236(a), (b), .316, .409, .440, .500, .501, .525, .526, .602, .908(a), .1000, .1020.	NA
Diphenylol propane-epichlorohydrin resins.	B	P	III	NR	Open	Open	A, B	**.409**, .440, .908(a)	NA
Di-n-propylamine	C	S/P	III	4m	PV	Restr	A	.236(b), (c), .409, .525, .526, .1020	I–C
Dodecanol	B	P	III	NR	Open	Open	A	.409, .440, .488, .908(a), (b)	I–D
Dodecene (all isomers)	B	P	III	NR	Open	Open	A	.409	I–D
Dodecyl alcohol, *see* Dodecanol									
•Dodecylamine, Tetradecylamine mixture	**A**	S/P	**II**	4m	PV	Restr	A, D	**.236(b), (c), .409** .526	NA
Dodecyldimethylamine, Tetradecyldimethylamine mixture.	A	S/P	II	NR	Open	Open	B, C, D	.236(b), .409	NA
Dodecyl diphenyl ether disulfonate solution.	**A**	S/P	**II**	NR	Open	Open	NSR	.409	NA
Dodecyl hydroxypropyl sulfide	[A]	P	II	NR	Open	Open	A	.409	NA
Dodecyl methacrylate	III	S	III	NR	Open	Open	A, C	.236(b), (c), .912(a)(1), .1004	I–D
Dodecyl-Pentadecyl methacrylate mixture.	III	S	III	NR	Open	Open	A, C, D	.912(a)(1), .1002(a), (b), .1004	NA
Dodecyl phenol	A	P	I	NR	Open	Open	A	.408	I–D
•Drilling brine (containing Zinc salts)	**B**	P	**III**	NR	Open	Open	NSR	.409	NA
Epichlorohydrin	**A**	S/P	II	B/3	PV	Closed	A	.316, .408, .525, .526, .527, .1020	I–C
Ethanolamine	D	S	III	NR	Open	Open	A	.236(b), (c), .526	I–D
2-Ethoxyethyl acetate	C	P	III	4m	PV	Restr	A	.409	I–C
Ethyl acrylate	A	S/P	II	4m	PV	Restr	A	.409, .526, .527, .912(a)(1), .1002(a), (b), .1004	I–D
Ethylamine	C	S/P	II	B/3	PV	Closed	C, D	.236(b), (c), .252, .372, **.409,** .525, .526, .527, .1020	I–D
Ethylamine solution (72% or less)	C	S/P	II	B/3	PV	Closed	A, C	.236(a), (b), (c), (g), .372, .408, .525(a), (c), (d), (e), .526, .527, .1020.	I–D

Ethyl amyl ketone	C	P	III	4m	PV	Restr	A	.409	I–D
Ethylbenzene	**B**	P	III	4m	PV	Restr	A	.409	I–D
N-Ethylbutylamine	C	S/P	III	4m	PV	Restr	A	.236(a), (b), (c), (g), .409, .525(a), (c), (d), (e), .526, .1020.	I–C
Ethyl butyrate	C	P	III	4m	PV	Restr	A	.409	I–D
Ethylcyclohexane	C	P	III	4m	PV	Restr	A	.409	I–D
N–Ethylcyclohexylamine	D	S	III	4m	PV	Restr	A, C	.236(a), (b), (c), (g), .409, .526	I–C
Ethylene chlorohydrin	C	S/P	II	B/3	PV	Closed	A, D	.316, .408, .525, .526, .527, .933, .1020	I–D
Ethylene cyanohydrin	D	S	III	NR	Open	Open	A	None	NA
Ethylenediamine	C	S/P	II	4m	PV	Restr	A	.236(b), (c), .409, .440, .526, .908(b)	I–D
Ethylene dibromide	B	S/P	II	B/3	PV	Closed	NSR	.408, .440, .525, .526, .527, .908(b), .1020	NA
Ethylene dichloride	B	S/P	II	4m	PV	Restr	A, B	.236(b), .408, .526	I–D
Ethylene glycol butyl ether acetate	C	P	III	NR	Open	Open	A	None	I–C
Ethylene glycol diacetate	C	P	III	NR	Open	Open	A	None	I–D
Ethylene glycol ethyl ether acetate, *see* 2-Ethoxyethyl acetate									
Ethylene glycol methyl ether acetate	C	P	III	NR	Open	Open	A	None	I–C
Ethylene glycol monoalkyl ether *Including:* *2-Ethoxyethanol* *Ethylene glycol butyl ether* *Ethylene glycol tert-butyl ether* *Ethylene glycol ethyl ether* *Ethylene glycol methyl ether* *Ethylene glycol n-propyl ether* *Ethylene glycol isopropyl ether*	D	S	III	4m	PV	Restr	A	.409	I–C
Ethylene glycol monoalkyl ethers	D	S	III	4m	PV	Restr	A	.409	I–C
Ethylene glycol propyl ether, *see* Ethylene glycol monoalkyl ethers.									
Ethylene oxide (30% or less), Propylene oxide mixture.	**C**	**S/P**	II	B/3	PV	Closed	A, C	.252, .372, .408, .440, .500, .525, .526, .530, .1010, .1011, .1020.	I–B
Ethyl ether	III	S	II	4m	PV	Closed	A	.236(g), .252, .372, .408, .440, .500, .515, .526, .527	I–C
•Ethyl-3-ethoxypropionate	**C**	P	III	4m	PV	Restr	A	.409	NA
2-Ethylhexanol	@C	P	III	NR	Open	Open	A	None	I–D
2-Ethylhexyl acrylate	B	S/P	III	NR	Open	Open	A	.409, .912(a)(1), .1002(a), (b), .1004	I–D
2-Ethylhexylamine	B	S/P	II	B/3	PV	Restr	A	.236(b), (c), .409, .525, .526, .1020	I–D
Ethyl hexyl phthalate	C	P	III	NR	Open	Open	A	None	NA
Ethylidene norbornene	B	S/P	III	B/3	PV	Restr	A, B, C, D	.236(b), .409, .526	NA
Ethyl methacrylate	D	S	III	4m	PV	Restr	A, B, D	**.409** ,.526, .912(a)(1), .1002(a), (b), .1004	I–D
Ethylphenol	A	S/P	III	NR	Open	Open	B	.409	I–D
2-Ethyl-3-propylacrolein	**A**	S/P	III	4m	PV	Restr	A	.409, .526,	I–C
Ethyl toluene	B	P	III	4m	PV	Restr	A	.409	I–D
Ferric chloride solutions	C	S/P	III	NR	Open	Open	NSR	.409, .440, .554, .555, .908(b), .1045	I–B
Ferric nitrate, Nitric acid solution	C	S/P	II	4m	PV	Restr	NSR	.408, .526, .527, .554, .555, .559, .933, .1045	I–B
Fluorosilicic acid (30% or less)	C	S/P	III	B/3	PV	Restr	NSR	.252, .526, **.527**, .554, .555, .933, .1045	I–B
Formaldehyde (50% or more), Methanol mixtures.	#	S/P	III	4m	PV	Closed	A	**.409**, .526, .527	I–B
Formaldehyde solution (37% to 50%)	C	S/P	III	4m	PV	Restr	A	**.409** .440, .526, .527, .908(b)	I–B
Formic acid	D	S	III	4m	PV	Restr	A	.238(b), (c), **.409**, .526, .527, .554	I–D

TABLE 1.—SUMMARY OF MINIMUM REQUIREMENTS—Continued

Cargo name	IMO Annex II pollution category	Haz.	Cargo containment system	Ventheight	Vent	Gauge	Fire protection system	Special requirements in 46 CFR Part 153	Electrical hazard class and group
a.	b.	c.	d.	e.	f.	g.	h.	i.	j.
Fumaric adduct of rosin, water dispersion.	B	P	III	NR	Open	Open	NSR	.409, .440, .908(a)	NA
Furfural	C	S/P	III	4m	PV	Restr	A	**.409**, .526	I–C
Furfuryl alcohol	C	P	III	NR	Open	Open	A	None	I–C
Glutaraldehyde solution (50% or less)	D	S	III	NR	Open	Open	NSR	None	NA
Glycidyl ester of C10 Trialkyl acetic acid, *see* Glycidyl ester of Tridecyl acetic acid.									
Glycidyl ester of Tridecyl acetic acid	B	P	III	NR	Open	Open	A	.409	NA
Heptane (all isomers)	C	P	III	4m	PV	Restr	A	.409	I–D
Heptanol (all isomers)	C	P	III	4m	PV	Restr	A	.409	I–D
Heptene (all isomers)	C	P	III	4m	PV	Restr	A	.409	I–D
Heptyl acetate	B	P	III	NR	Open	Open	A	**.409**	NA
Hexamethylenediamine solution	C	S/P	III	4m	PV	Restr	A	.236(b), (c), .409, .440, .526, .908(b)	I–D
Hexamethyleneimine	C	S/P	II	4m	PV	Restr	A, C	.236(a), (b), (c), (g), **.409**, .526	I–C
Hexane (all isomers)	C	P	III	4m	PV	Restr	A	.409	I–D
Hexene (all isomers)	C	P	III	4m	PV	Restr	A	.409	I–D
Hexyl acetate	B	P	III	4m	PV	Restr	A	.409	I–D
Hydrochloric acid	D	S	III	4m	PV	Restr	NSR	.252, .526, .527, .554, .557, .933, .1045, .1052	I–B
Hydrogen peroxide solutions (over 8% but not over 60%).	C	S/P	III	B/3	PV	Closed	NSR	.238(a), (c), .355, .409, .440(a) (1)&(2), .500, .933, .1004(a)(2), .1500.	NA
Hydrogen peroxide solutions (over 60% but not over 70%).	C	S/P	II	B/3	PV	Closed	NSR	.238(a), (c), .355, .409, .440(a) (1)&(2), .500, .933, .1004(a)(2), .1500.	NA
2-Hydroxyethyl acrylate	B	S/P	II	B/3	PV	Closed	A	.408, .525, .526, .912(a)(1), .933, .1002(a), (b), .1004, .1020.	NA
•2-Hydroxy-4-(methylthio)butanoic acid	**C**	P	III	NR	Open	Open	A	.440, .903, .908(a)	NA
Icosa (oxypropane-2,3-diyl)s	B	P	III	NR	Open	Open	A	.409, .440, .908(a)	NA
Isophorone diamine	D	S	III	4m	PV	Restr	A	.236(b), (c), .526	NA
Isophorone diisocyanate[6]	B	S/P	**II**	B/3	PV	Closed	A, B, C[6], D	.236(a), (b), .316, **.409**, .500, .501, **.525** .526, .602, .1000, .1020.	NA
Isoprene	C	S/P	III	4m	PV	Restr	B	.372, **.409**, .440, .912(a)(1), .1002(a), (b), .1004	I–D
Isopropylbenzene (Cumene), *see* Propylbenzene (all isomers)									
Lactonitrile solution (80% or less)	B	S/P	II	B/3	PV	Closed	A, C, D	.238(d), .252, .316, .336, .408, .440, .525, .526, .527, .908(a), .912(a)(2), .1002, .1004, .1020, .1035.	I–D
Lauric acid	B	P	III	NR	Open	Open	A	**.409**, .440, .488, .908(a), (b)	NA
Lauryl polyglucose (50% or less)	[B]	P	III	NR	Open	Open	No	.409, .440, .488, .908 (a), (b)	NA
Long chain alkaryl polyether (C11–C20)	C	P	III	NR	Open	Open	A, B	(.440, .903, .908(a))[1]	NA
Long chain polyetheramine in alkyl(C2–C4)benzenes.	C	P	III	4m	PV	Restr	A	.409, .440, .903, .908(a)	I–D

Magnesium long chain alkyl salicylate (C11+).	C	P	III	NR	Open	Open	A, B	(.440, .903, .908(a))[1]	NA
Maleic anhydride[7]	D	S	III	4m	PV	Restr	[7]A, C	None	I–D
Mercaptobenzothiazol, sodium salt solution, *see* Sodium-2-mercaptobenzothiazol solution									
Mesityl oxide	D	S	III	4m	PV	Restr	A	.236(b), (c), .409, .526	I–D
Metam sodium solution	A	S/P	**II**	NR	Open	Open	NSR	.236(a), (b), (c), (g), .409	NA
Methacrylic acid	D	S	III	4m	PV	Restr	A	.238(a), .526, .912(a)(1), .1002(a), .1004	NA
Methacrylic resin in Ethylene dichloride	B	S/P	II	4m	PV	Restr	A, B	.236(b), .408, .440, .526, .908(a)	I–D
•Methacrylonitrile	**D**	**S**	II	B/3	PV	Closed	A	.236(b), .316, .408, .525, .526, .527, .912(a)(1), .1002(a), .1004, .1020.	NA
N-(2-Methoxy-1-methyl ethyl)-2-ethyl-6-methyl chloroacetanilide, *see* Metolachlor									
Methyl acrylate	B	S/P	II	4m	PV	Restr	A, B	.409, .526, .527, .912(a)(1), .1002(a), (b), .1004	I–D
Methylamine solution (42% or less)	C	S/P	II	B/3	PV	Closed	A, C, D	.236(a), (b), (c), (g), .316, .408, .525, .526, .527, .1020.	I–D
Methylamyl acetate	C	P	III	4m	PV	Restr	A	.409	I–D
•Methylamyl **alcohol**	C	P	III	4m	PV	Restr	A	.409	I–D
Methyl butyrate	C	P	III	4m	PV	Restr	A	.409	I–D
Methylcyclohexane	C	P	III	4m	PV	Restr	A	.409	I–D
Methylcyclopentadiene dimer	B	P	III	4m	PV	Restr	B	.409	I–B
•Methyl diethanolamine	**D**	**S**	III	NR	Open	Open	A	**.236(b), (c)**	I–C
Methylene chloride, see Dichloromethane									
2-Methyl-6-ethylaniline	C	S/P	III	NR	Open	Open	A, B, C, D	None	NA
2-Methyl-5-ethylpyridine	B	S/P	III	NR	Open	Open	A, D	.236(b), .409	I–D
Methyl formate	D	S	II	B/3	PV	Restr	A	.372, .408, .440, .525, .526, .527, .1020	I–D
Methyl heptyl ketone	B	P	III	4m	PV	Restr	A	.409	I–D
2-Methyl-2-hydroxy-3-butyne	III	S	III	4m	PV	Restr	A, B, C, D	.236(b), (d), (f), (g), .409, .526	I–D
Methyl methacrylate	D	S	II	4m	PV	Restr	A, B	**.409**, .526, .912(a)(1), .1002(a), (b), .1004	I–D
Methyl naphthalene (molten)	A	S/P	II	4m	PV	Restr	A, D	.409	I–D
•2-Methyl-1-pentene, *see* **Hexene (all isomers)**.									
•4-Methyl-1-pentene, *see* **Hexene (all isomers)**.									
•2-Methylpyridine	**D**	**S**	II	B/3	PV	Closed	A, C	.236(b), .408, .525(a), (c), (d), (e), .1020	I–D
•3-Methylpyridine	**C**	S/P	II	B/3	PV	Closed	A, C	.236(b), .408, .525(a), (c), (d), (e), .1020	I–D
•4-Methylpyridine	**D**	**S**	II	B/3	PV	Closed	A, C, D	.236(b), .408, .440, .525(a), (c), (d), (e), .526, .908(b), .1020.	I–D
Methyl salicylate	B	P	III	NR	Open	Open	A	.409	I–D
•alpha-Methylstyrene	A	S/P	III	4m	PV	Restr	A, D	**.409, .526, .912(a)(1), .1002(a), (b), .1004**	I–D
Metolachlor	B	P	III	NR	Open	Open	A	.409	NA
Morpholine	D	S	III	4m	PV	Restr	A	.236(b), (c), **.409**	I–C
Motor fuel anti-knock compounds (containing lead alkyls).	A	S/P	**I**	B/3	PV	Closed	A, B, C	.252, .316, .336, .408, .525, .526, .527, .933, .1020, .1025.	I–D
Naphthalene (molten)	A	S/P	II	4m	PV	Restr	A, D	.409, .440, .908(b)	I–D

TABLE 1.—SUMMARY OF MINIMUM REQUIREMENTS—Continued

Cargo name	IMO Annex II pollution category	Haz.	Cargo containment system	Ventheight	Vent	Gauge	Fire protection system	Special requirements in 46 CFR Part 153	Electrical hazard class and group
a.	b.	c.	d.	e.	f.	g.	h.	i.	j.
Naphthalene sulfonic acid, sodium salt solution (40% or less).	[A]	P	III	NR	Open	Open	NSR	**.409**	NA
Naphthenic acid	A	P	II	NR	Open	Open	A	.409	NA
Naphthenic acid, sodium salt solution	[A]	P	II	NR	Open	Open	NSR	.409	NA
Neodecanoic acid	C	P	III	NR	Open	Open	A	None	NA
Nitrating acid *(mixture of sulfuric and nitric acids).*	C	S/P	II	B/3	PV	Closed	NSR	.316, .408, .526, .527, .554, .555, .556, .559, .602, .933, .1000, .1045.	I–B
Nitric acid (70% or less)	C	S/P	II	4m	PV	Restr	NSR	.408, .526, .527, .554, .555, .559, .933, .1045	I–B
Nitrobenzene	B	S/P	II	B/3	PV	Closed	A, D	.316, .336, .408, .440, .525, .526, .908(b), .933, .1020.	I–D
•o-Nitrochlorobenzene, *see* **o-Chloronitrobenzene**.									
Nitroethane[7]	D	S	III	4m	PV	Restr	[7]A,C	.236(b), .409, .526, .1002 (a), (b), .1003	I–C
o-Nitrophenol (molten)	B	S/P	II	B/3	PV	Closed	A, C, D	**.409**, .440, .525, .526, .908(a), (b), .1020	NA
1- or 2-Nitropropane[7]	D	S	III	4m	PV	Restr	[7]A, C	**.409**, .526	I–C
Nitropropane (60%), Nitroethane (40%) mixture[7].	D	S	III	4m	PV	Restr	[7]A, C	.236(b), **.409**, .526	I–C
Nitropropane (20%), Nitroethane (80%)[7]	D	S	III	4m	PV	Restr	[7]A,C	.236(b), .409, .526, .1002 (a), (b), .1003	I–C
(o-, p-) Nitrotoluene	**B**	S/P	II	B/3	PV	Closed	A, B	.316, .408, .440, .525, .526, .908(b), .1020	I–D
Nonane (all isomers)	C	P	III	4m	PV	Restr	B, C	.409	I–D
•Nonene **(all isomers)**	B	P	III	4m	PV	Restr	A	.409	I–D
Nonyl acetate	C	P	III	NR	Open	Open	A	.409	I–D
Nonyl alcohol (all isomers)	C	P	III	NR	Open	Open	A	None	I–D
Nonyl phenol	A	P	II	NR	Open	Open	A	.409	I–D
Nonyl phenol poly(4–12)ethoxylates	B	P	III	NR	Open	Open	A	.409, .440, .488[1], .908(a), (b)	I–D
Noxious liquid, N.F., (1) n.o.s. (''trade name'' contains ''principal components'') ST 1, Cat A.	A	P	I	NR	Open	Open	A	.408	NA
Noxious liquid, F., (2) n.o.s. (''trade name'' contains ''principal components'') ST 1, Cat A.	A	P	I	4m	PV	Restr	A	.408	NA
Noxious liquid, N.F., (3) n.o.s. (''trade name'' contains ''principal components'') ST 2, Cat A.	A	P	II	NR	Open	Open	A	.409	NA
Noxious liquid, F., (4) n.o.s. (''trade name'' contains ''principal components'') ST 2, Cat A.	A	P	II	4m	PV	Restr	A	.409	NA
•Noxious liquid, N.F., (5) n.o.s. (''trade name'' contains ''principal components'') ST 2, Cat B.	B	P	II	NR	Open	Open	A	.409; (**.440, .908**)[1]	NA

•Noxious liquid, N.F., (6) n.o.s. (''trade name'' contains ''principal components'') ST 2, Cat B, mp. equal to or greater than 15 deg. C.	B	P	II	NR	Open	Open	A	.409, .440, .488, .908(b); (**.908(a)**)[1]	NA
•Noxious liquid, F., (7) n.o.s. (''trade name'' contains ''principal components'') ST 2, Cat B.	B	P	II	4m	PV	Restr	A	.409; (**.440, .908**)[1]	NA
•Noxious liquid, F., (8) n.o.s. (''trade name'' contains ''principal components'') ST 2, Cat B, mp. equal to or greater than 15 deg. C.	B	P	II	4m	PV	Restr	A	.409, .440, .488, .908(b); (**.908(a)**)[1]	NA
Noxious liquid, N.F., (9) n.o.s. (''trade name'' contains ''principal components'') ST 3, Cat A.	A	P	III	NR	Open	Open	A	**.409**	NA
Noxious liquid, F., (10) n.o.s. (''trade name'' contains ''principal components'') ST 3, Cat A.	A	P	III	4m	PV	Restr	A	.409	NA
•Noxious liquid, N.F., (11) n.o.s. (''trade name'' contains ''principal components'') ST 3, Cat B.	B	P	III	NR	Open	Open	A	(**.409**, **.440, .908**)[1]	NA
•Noxious liquid, N.F., (12) n.o.s. (''trade name'' contains ''principal components'') ST 3, Cat B, mp. equal to or greater than 15 deg. C.	B	P	III	NR	Open	Open	A	**.409**, .440, .488, .908(b); (**.908(a)**)[1]	NA
•Noxious liquid, F., (13) n.o.s. (''trade name'' contains ''principal components'') ST 3, Cat B.	B	P	III	4m	PV	Restr	A	.409; (**.440, .908**)[1]	NA
•Noxious liquid, F., (14) n.o.s. (''trade name'' contains ''principal components'') ST 3, Cat B, mp. equal to or greater than 15 deg. C.	B	P	III	4m	PV	Restr	A	.409, .440, .488, .908(b); (**.908(a)**)[1]	NA
Noxious liquid, N.F., (15) n.o.s. (''trade name'' contains ''principal components'') ST 3, Cat C.	C	P	III	NR	Open	Open	A	(.440, .903, .908)[1]	NA
Noxious liquid, F., (16) n.o.s. (''trade name'' contains ''principal components'') ST 3, Cat C.	C	P	III	4m	PV	Restr	A	(.440, .903, .908)[1]	NA
Octane (all isomers)	C	P	III	4m	PV	Restr	A	.409	I–D
Octanol (all isomers)	C	P	III	NR	Open	Open	A	None	I–D
Octene (all isomers)	B	P	III	4m	PV	Restr	A	.409	I–D
Octyl acetate	C	P	III	NR	Open	Open	A	None	I–D
Octyl aldehydes	B	P	III	4m	PV	Restr	A	.409, .440, .908(b)	I–C
•Octyl nitrates (all isomers), *see* **Alkyl(C7–C9) nitrates**.	C	P	III	4m	PV	Restr	A	.409	I–D
Olefin mixtures (C5–C7)	C	P	III	4m	PV	Restr	A	.409	I–D
Olefin mixtures (C5–C15)	B	P	III	4m	PV	Restr	A	.409, .440, .908(a), (b)	I–D
alpha-Olefins (C6–C18) mixtures	B	P	III	4m	PV	Restr	A	.316, .408, .440, .526, .527, .554, .555, .556, .602, .908(a), .933, .1000, .1045, .1052.	I–B
Oleum	C	S/P	II	B/3	PV	Closed	NSR	.409, .526	NA
Oleylamine	A	S/P	II	4m	PV	Restr	A		

TABLE 1.—SUMMARY OF MINIMUM REQUIREMENTS—Continued

Cargo name	IMO Annex II pollution category	Haz.	Cargo containment system	Ventheight	Vent	Gauge	Fire protection system	Special requirements in 46 CFR Part 153	Electrical hazard class and group
a.	b.	c.	d.	e.	f.	g.	h.	i.	j.
•**Palm kernel acid oil**	C	P	III	NR	Open	Open	A, B	.440, .903, .908(a), (b)	NA
Paraldehyde	C	S/P	III	4m	PV	Restr	A	**.409**, .440, .908(b)	I–C
Pentachloroethane	B	S/P	II	B/3	PV	Restr	NSR	.316, .409, .525, .526, .1020	NA
1,3-Pentadiene	C	S/P	III	4m	PV	Restr	A, B	**.409**, .526, .912(a)(1), .1002, .1004	I–D
Pentane (all isomers)	C	P	III	4m	PV	Restr	A	**.372,**.409	I–D
Pentene (all isomers)	C	P	III	4m	PV	Restr	A	**.409**	I–D
n–Pentyl propionate	C	P	III	4m	PV	Restr	A	.409	I–D
Perchloroethylene	B	S/P	III	**B/3**	PV	Restr	NSR	**.409**, .526	NA
•Phenol *(or solutions with 5% or more Phenol)*.	**C**	S/P	II	B/3	PV	Closed	A	.408, .440, .488, .525, .526, .908(a), (b), .933, .1020	I–D
1-Phenyl-l-xylyl ethane	C	P	III	NR	Open	Open	A, B	None	NA
Phosphoric acid	D	S	III	NR	Open	Open	NSR	.554, .555, .558, .1045, .1052	I–B
Phthalic anhydride (molten)	C	S/P	III	4m	PV	Restr	A, D	.440, .908(a), (b)	I–D
Pinene, *see the alpha- or beta- isomers.*									
alpha-Pinene	**A**	P	III	4m	PV	Restr	A	.409	I–D
beta-Pinene	B	P	III	4m	PV	Restr	A	.409	I–D
•Pine oil	**C**	P	III	NR	Open	Open	A	.440, .908(a)	I–D
•Polyalkyl(C18–C22) acrylate in Xylene	**C**	P	III	4m	PV	Restr	A	.409, .440, .903, .908(a)	NA
•Polyalkylene oxide polyol	**C**	P	III	NR	Open	Open	A	.440, .903, .908(a)	NA
Poly(2+)cyclic aromatics	A	P	II	4m	PV	Restr	A, D	.409	I–D
Polyethylene polyamines	C	S/P	III	NR	Open	Open	A	.236(b), (c), .400, .440, .908(b)	NA
Polyferric sulfate solution	C	S/P	III	NR	Open	Open	NSR	.238(d)	NA
Polymethylene polyphenyl isocyanate[6]	D	S	II	B/3	PV	Closed	A, C[6], D	.236(a), (b), .409, .500, .501, .525, .526, .602, .1000, .1020.	NA
Polyolefinamine in alkyl(C2–C4)benzenes.	C	P	III	4m	PV	Restr	A	.409, .440, .903, .908(a)	I–D
Polyolefin phosphorosulfide, barium derivative (C28–C250).	C	P	III	NR	Open	Open	A, B	(.440, .903, .908(a))[1]	NA
Potassium hydroxide solution, *see* Caustic potash solution									
Potassium oleate	C	P	III	NR	Open	Open	A	.409	NA
Potassium polysulfide, Potassium thiosulfate solution (41% or less).	[C]	S/P	III	NR	Open	Open	No	.236 (b), (c), .409	NA
Propanil, Mesityl oxide, Isophorone mixture.	[B]	S/P	III	4m	PV	Restr	A, B	.409, .440, .526, .908(a), (b)	NA
iso-Propanolamine	C	S/P	III	NR	Open	Open	A	.236(b), (c), .440, .526, .903, .908(b)	I–D
n-Propanolamine	C	S/P	III	NR	Open	Open	A, D	.236(b), (c), .440, .526, .908(b)	NA
Propionaldehyde	C	SP	III	4m	PV	Restr	A	.316, **.409**, .526, .527	I–C
Propionic acid	D	S	III	4m	PV	Restr	A	.238(a), **.409**, .527, .554	I–D
Propionic anhydride	C	S/P	III	4m	PV	Restr	A	.238(a), .526	I–D

Propionitrile	C	S/P	II	B/3	PV	Closed	A, D	.252, .316, .336, .408, .525, .526, .527, .1020	I–D
iso-Propylamine	C	S/P	II	B/3	PV	Closed	C, D	.236(b), (c), .372, .408, .440, .525, .526, .527, .1020	I–D
iso-Propylamine solution (70% or less)	C	S/P	II	B/3	PV	Closed	C,D	.236 (a), (b), (c), (g), .408, .440, .525, .526, .527, .1010.	I–D
n-Propylamine	C	S/P	II	B/3	PV	Closed	A, C, D	.236(b), (c), .408, .500, .525, .526, .527, .1020	I–D
n-Propylbenzene, *see* **Propylbenzene (all isomers)**.									
Propylbenzene (all isomers)	**A**	P	III	4m	PV	Restr	A	.409	I–D
n-Propyl chloride	D	S	III	4m	PV	Restr	A, B	.409	I–D
iso-Propylcyclohexane	C	P	III	4m	PV	Restr	A	.409, .440, .903, .908(a)	I–D
Propylene dimer	C	P	III	4m	PV	Restr	A	.409	NA
Propylene oxide	**C**	**S/P**	II	B/3	PV	Closed	A, C	.372, .408, .440, .500, .526, .530, .1010, .1011	I–B
Propylene tetramer	B	P	III	4m	PV	Restr	A	.409	I–D
Propylene trimer	B	P	III	4m	PV	Restr	A	.409	I–D
iso-Propyl ether	D	S	III	4m	PV	Restr	A	.409, .500, .515, .912(a)(1)	I–D
Pyridine	D	S	III	4m	PV	Restr	A	.236(b), .409	I–D
Rosin, *see* Rosin oil.									
Rosin oil	B	P	III	NR	Open	Open	A	.409, .440, .488, .908(a), (b)	I–D
Rosin soap (disproportionated) solution	B	P	III	NR	Open	Open	A	.409	NA
Sodium aluminate solution	D	S	III	NR	Open	Open	NSR	.236(a), (b), (c), (g), .933	NA
Sodium borohydride (15% or less), Sodium hydroxide solution.	C	S/P	III	NR	Open	Open	NSR	.236(a), (b), (c), (g), .440, .908(a), .933	NA
Sodium chlorate solution (50% or less)	III	S	III	NR	Open	Open	NSR	.409, .933, .1065	NA
Sodium dichromate solution (70% or less).	C	S/P	II	B/3	Open	Closed	NSR	.236(b), (c), .408, .525, .933, .1020	NA
•*Sodium dimethyl naphthalene sulfonate solution, see* Dimethyl naphthalene sulfonic acid, sodium salt solution.									
•Sodium hydrogen sulfide (6% or less), Sodium carbonate (3% or less) solution.	**B**	P	III	NR	Open	Open	NSR	**.409**	NA
Sodium hydrogen sulfite solution **(45% or less)**.	D	S	III	NR	Open	Open	NSR	None	NA
Sodium hydrosulfide solution (45% or less).	B	S/P	III	4m	PV	Restr	NSR	.409, .440, .526, .908(b), .933	NA
Sodium hydrosulfide, Ammonium sulfide solution.	B	S/P	II	B/3	PV	Closed	A, C	.236(a), (b), (c), (g), .316, .372, .408, .525, .526, .527, .933, .1002, .1020.	NA
Sodium hydroxide solution, *see* Caustic soda solution									
•Sodium hypochlorite solution (15% or less).	C	S/P	III	4m	PV	Restr	NSR	.236(a), (b), **.933**	NA
Sodium long chain alkyl salicylate (C13+).	[C]	P	III	NR	Open	Open	A	(.440, .903, .908(a))[1]	NA
Sodium-2-mercaptobenzothiazol solution	B	S/P	III	NR	Open	Open	NSR	.236(a), (b), (c), (g), .409, .440, .908(b), .933	NA
•*Sodium N-methyldithiocarbamate solution, see* Metam sodium solution.									
•*Sodium naphthalene sulfonate solution (40% or less), see* Naphthalene sulfonic acid, sodium salt solution (40% or less).									

TABLE 1.—SUMMARY OF MINIMUM REQUIREMENTS—Continued

Cargo name	IMO Annex II pollution category	Haz.	Cargo containment system	Ventheight	Vent	Gauge	Fire protection system	Special requirements in 46 CFR Part 153	Electrical hazard class and group
a.	b.	c.	d.	e.	f.	g.	h.	i.	j.
•Sodium naphthenate solution, see Naphthenic acid, sodium salt solution.									
Sodium nitrite solution	B	S/P	II	NR	Open	Open	NSR	.408, .525(a), (c), (d), (e), .1020	NA
Sodium petroleum sulfonate	B	S/P	II	NR	Open	Open	A	.409, .440, .908(a)	NA
Sodium silicate solution	C	P	III	NR	Open	Open	A	None	NA
•Sodium sulfide solution (15% or less)	**C**	S/P	III	B/3	PV	Closed	NSR	.236(a), (b), .409, .440, .526, .908(b)	NA
Sodium sulfite solution (25% or less)	C	P	III	NR	Open	Open	NSR	.409, .440, .908(b)	NA
•**Sodium tartrates, Sodium succinates solution**.	D	S	III	NR	Open	Open	A, B	.238(e)	NA
Sodium thiocyanate solution (56% or less).	B	P	III	NR	Open	Open	NSR	.238(a), .409	NA
Styrene *monomer*	B	S/P	III	4m	PV	**Restr**	A, B	.236(b), .409, .912(a)(1), .1002(a), (b), .1004	I–D
Sulfohydrocarbon, long chain (C18+) alkylamine mixture.	B	P	III	NR	Open	Open	A, B	.409; (**.440, .908(a)**)[1]	NA
Sulfur (molten)	III	S	III	NR	Open	Open	NSR	.252, .440, .526, .545	I–C
Sulfuric acid	C	S/P	III	NR	Open	Open	NSR	.440, .554, .555, .556, .602, .908(a), (b), .933, .1000, .1045, .1046, .1052.	I–B
Tall oil *(crude and distilled)*	B	P	III	NR	Open	Open	A	.409, .440, .488, .908(a), (b)	NA
Tall oil, fatty acid *(resin acids less than 20%)*.	C	P	III	NR	Open	Open	A	.440, .908(a), (b)	NA
Tall oil fatty acid, barium salt	B	S/P	III	NR	Open	Open	A	.409, .440, .908(a)	NA
Tall oil soap (disproportionated) solution	B	P	III	NR	Open	Open	A	.409, .440, .908(a), (b)	NA
1,1,2,2-Tetrachloroethane	B	S/P	III	B/3	PV	Restr	NSR	.316, .409, .525, .526, .1020	NA
Tetraethylenepentamine[3]	D	S	III	NR	Open	Open	A	.236(b), (c), (g)	I–C
Tetrahydrofuran	D	S	III	4m	PV	Restr	A, D	**.409,** .526, .912(a)(2), .1004	I–C
Tetrahydronaphthalene	C	P	III	NR	Open	Open	A	None	I–D
1,2,3,5-Tetramethylbenzene, *see* **Tetramethylbenzene (all isomers)**.									
Tetramethylbenzene (all isomers)	**A**	P	III	NR	Open	Open	A	None	I–D
Toluene	C	P	III	4m	PV	Restr	A	.409	I–D
Toluenediamine	C	S/P	II	B/3	PV	Closed	A, B, C, D	.236(a), (b), (c), (g), .316, .408, .440, .525, .526, .527, .908(a), (b), .933, .1020.	NA
Toluene diisocyanate[6]	C	S/P	II	4m	PV	Closed	A, C[6], D	.236(b), .316, .408, .440, .500, .501, .525, .526, .527, .602, .908(b), .1000, .1020.	I–D
o-Toluidine	C	S/P	II	B/3	PV	Closed	A, C	.316, .408, .525, .526, .933, .1020	I–D
Tributyl phosphate	B	P	III	NR	Open	Open	A	.409	I–D
1,2,4-Trichlorobenzene	B	S/P	II	4m	PV	Restr	A, B, C	.409, .440, .526, .908(b)	I–D
•1,1,1-Trichloroethane	**C**	P	III	NR	Open	Open	A	.409	I–D
•1,1,2-Trichloroethane	**C**	S/P	III	B/3	PV	Restr	NSR	.409, .525, .526, **.933**, .1020	I–D
•Trichloroethylene	**C**	S/P	III	B/3	PV	Restr	NSR	.316, .409, .525, .526, .1020	I–D

•1,2,3-Trichloropropane	**C**	S/P	II	B/3	PV	Closed	A, B, C, D	.316, .408, .525, .526, **.933**, .1020	I–D
1,1,2-Trichloro-1,2,2-trifluoroethane	C	P	III	NR	Open	Open	NSR	None	NA
Tricresyl phosphate (less than 1% of the ortho isomer).	A	P	II	NR	Open	Open	A	.409	I–D
Tricresyl phosphate (1% or more of the ortho isomer).	A	S/P	I	4m	PV	Closed	A, B	.408, .525(a), (c), (d), (e), .1020	I–D
Tridecanoic acid	B	P	III	NR	Open	Open	A	.409, .440, .488, .908(a), (b)	NA
Triethanolamine	D	S	III	NR	Open	Open	A	.236(a), (b), (c), (g)	I–C
Triethylamine	C	S/P	II	B/3	PV	Restr	A, B, C	.236(b), (c), **.409**, .525, .526, .527, .1020	I–C
Triethylbenzene	A	P	II	NR	Open	Open	A	.409	I–D
Triethylene glycol di-(2-ethylbutyrate)	[C]	P	III	NR	Open	Open	A	None	I–C
Triethylenetetramine	D	S	III	NR	Open	Open	A	.236(a), (b), (c)	I–C
Triethyl phosphite	**B**	**S/P**	III	B/3	PV	Restr	A, B, D	**.409**, .526	NA
Trifluralin in Xylene	[A]	S/P	II	4m	PV	Restr	A, B	.409, .526	I–D
Triisopropylated phenyl phosphates	A	P	II	NR	Open	Open	A	.409	NA
Trimethylacetic acid	D	S	III	4m	PV	Restr	A, C	.238(a), .266, .554	I–D
Trimethylamine solution (30% or less)	C	S/P	II	B/3	PV	Closed	A, C	.236(a), (b), (c), (g), .372, .408, .440, .525, .526, .527, .908(b), .1020.	I–C
•Trimethylbenzene (all isomers)	**A**	P	III	4m	PV	Restr	A	.409	I–D
Trimethylhexamethylenediamine (2,2,4- and 2,4,4- isomers).	D	S	III	NR	Open	Open	A, C	.236(a), (b), (c), (g), .409	NA
Trimethylhexamethylene diisocyanate (2,2,4- and 2,4,4- isomers)[6].	B	S/P	II	B/3	PV	Closed	A, C[6]	.316, .409, .500, .501, .525, .526, .602, .1000, .1020	NA
2,2,4-Trimethyl-1,3-pentanediol-1-isobutyrate.	C	P	III	NR	Open	Open	A	None	I–D
Trimethyl phosphite	#	S	III	4m	PV	Restr	A, D	.409, .526, .602, .1000	I–D
1,3,5-Trioxane	D	S	III	4m	PV	Restr	A, D	.409	I–C
Trixylenyl phosphate	A	P	I	NR	Open	Open	A	.408	NA
Trixylyl phosphate, *see* Trixylenyl phosphate.									
Turpentine	B	P	III	4m	PV	Restr	A	.409	I–D
•Undecanoic acid	**B**	P	III	NR	Open	Open	A	**.440, .908(a), (b)**	NA
1-Undecene	B	P	III	NR	Open	Open	A	.409	I–D
1- Undecyl alcohol	B	P	III	NR	Open	Open	A	**.409**, .440, .908(b)	I–D
Urea, Ammonium nitrate solution (containing more than 2% NH_3).	C	S/P	III	4m	PV	Restr	A	.236(b), .526	I–D
iso-Valeraldehyde, *see* **Valeraldehyde (all isomers)**.									
n-Valeraldehyde, *see* **Valeraldehyde (all isomers)**.									
Valeraldehyde (all isomers)	**C**	**S/P**	III	4m	PV	Restr	A	**.409**, .500, .526	I–C
Vinyl acetate	C	S/P	III	4m	PV	**Restr**	A	**.409**, .912(a)(1), .1002(a), (b), .1004	I–D
Vinyl ethyl ether	C	S/P	II	4m	PV	Closed	A	.236(b), (d), (f), (g), .252, .372, .408, .440, .500, .515, .526, .527, .912(a)(1), .1002(a), (b), .1004.	I–C
•Vinylidene chloride	**D**	**S**	II	4m	PV	Restr	B	.236(a), (b), .372, .409, .440, **.500**, .526, .527, .912(a)(1), .1002(a), (b), .1004.	I–D
Vinyl neodecanate	B	S/P	III	NR	Open	Open	A, B	.409, .912(a)(1), .1002(a), (b), .1004	NA
Vinyltoluene	A	S/P	III	4m	PV	Restr	A, B, D	.236(a), (b), (c), (g), .409, .912(a)(1), .1002(a), (b), .1004.	I–D

TABLE 1.—SUMMARY OF MINIMUM REQUIREMENTS—Continued

Cargo name	IMO Annex II pollution category	Haz.	Cargo containment system	Ventheight	Vent	Gauge	Fire protection system	Special requirements in 46 CFR Part 153	Electrical hazard class and group
a.	b.	c.	d.	e.	f.	g.	h.	i.	j.
White spirit (low (15–20%) aromatic)	B	P	II	4m	PV	Restr	A	.409	NA
Xylenes[8] *(ortho-, meta-, para-)*	C	P	III	4m	PV	Restr	A	.409, .440, .908(b)[8]	I–D
Xylenol	B	S/P	III	NR	Open	Open	A, B	.409, .440, .908(a), (b)	NA
Zinc alkaryl dithiophosphate (C7–C16) ...	C	P	III	NR	Open	Open	A, B	(.440, .903, .908(a))[1]	NA
Zinc alkyl dithiophosphate (C3–C14)	B	P	III	NR	Open	Open	A, B	.409; (**.440, .908(a)**)[1]	NA

Items with a bullet (•) or in **boldface** are changes since October 1, 1993.

Column Heading Footnotes:

a. The cargo name must be as it appears in this column (see 153.900, 153.907). Words in italics are not part of the cargo name but may be used in addition to the cargo name. When one entry references another entry by use of the word ''*see*'', and both names are in roman type, either name may be used as the cargo name (e.g., Diethyl ether, *see* Ethyl ether). However, the referenced entry is preferred.

The provisions contained in 46 CFR part 197, subpart C, apply to liquid cargoes containing 0.5% or more benzene by volume.

b. This column lists the IMO Annex II Pollution Category.

A, B, C, D—NLS Category of Annex II of MARPOL 73/78.
III—Appendix III of Annex II (non-NLS cargoes) of MARPOL 73/78.
#—No determination of NLS status. For shipping on an oceangoing vessel, see 46 CFR 153.900(c).
[ ]—A NLS category in brackets indicates that the product is provisionally categorized and that further data are necessary to complete the evaluation of its pollution hazards. Until the hazard evaluation is completed, the pollution category assigned is used.
@—The NLS category has been assigned by the U.S. Coast Guard, in absence of one assigned by the IMO. The category is based upon a GESAMP Hazard Profile or by analogy to a closely related product having an NLS assigned.

c. This column lists the hazard(s) of the commodity:

S—The commodity is included because of its safety hazards.
P—The commodity is included because of its pollution hazards.
S/P—The commodity is included because of both its safety and pollution hazards.

d. This column lists the type of containment system the cargo must have (see 153.230 through 153.232).
e. This column lists the height of any vent riser required (see 153.350 and 153.351).
f. This column lists any vent control valve required (see 153.355).
g. This column lists the type of gauging system required (see 153.400 through 153.406).

h. This column lists the type of fire protection system required. Where more than one system is listed, any listed system may be used. A dry chemical system may not be substituted for either type of foam system unless the dry chemical system is listed as an alternative or the substitution is approved by Commandant (G–MSO) (see 153.460). The types are as follows:

A is a foam system for water soluble cargoes (polar solvent foam).
B is a foam system for water insoluble cargoes (non-polar solvent foam).
C is a water spray system.
D is a dry chemical system.
NSR means there is no special requirement applying to fire protection systems.

i. This column lists sections that apply to the cargo in addition to the general requirements of this part. The 153 Part number is omitted.

j. This column lists the electrical hazard class and group used for the cargo when determining requirements for electrical equipment under Subchapter J (Electrical Engineering) of this chapter.

A number of electrical hazard class and group assignments are based upon that which appears in ''Classification of Gases, Liquids and Volatile Solids Relative to Explosion-Proof Electrical Equipment'', Publication NMAB 353–5, National Academy Press, 1982, when not appearing in NFPA 497M, ''Manual for Classification of Gases, Vapors and Dusts for Electrical Equipment in Hazardous (Classified) Locations.''

The I–B electrical hazard does not apply to weather deck locations (see 46 CFR Part 111) for inorganic acids: Chlorosulfonic acid; Hydrochloric acid; Nitrating acid; Nitric acid (70% or less); Oleum; Phosphoric acid; Sulfuric acid.

Abbreviations used in the Table:

NR—No requirement.
NA—Not applicable.

Abbreviations for Noxious Liquid cargoes:

N.F.—non-flammable (flash point greater than 60 deg C (140 deg F) closed cup (cc)).
F.—flammable (flash point less than or equal to 60 deg C (140 deg F) closed cup (cc)).
n.o.s.—not otherwise specified.
ST—Ship type.
Cat—Pollution category.

Footnotes for Specific Cargoes:

1. Special applicability:

153.440 and .908(a) apply to the chemical, and mixtures containing the chemical, with a viscosity of 25 mPa.s at 20 deg C (68 deg F).
153.440 and .908(b) apply to the chemical, and mixtures containing the chemical, with a melting point of 0 deg C (32 deg F) and above.
153.488 applies to the chemical, and mixtures containing the chemical, with a melting point of 15 deg C (59 deg F) and above.

2. Benzene containing cargoes.

Applies to mixtures containing no other components with safety hazards and where the pollution category is C or less.

3. Diammonium salt of Zinc ethylenediaminetetraacetic acid solution; Tetraethylenepentamine.

Aluminum is a questionable material of construction with this cargo since pitting and corrosion has been reported. The IMO Chemical Code prohibits aluminum as a material of construction for this cargo.

4. 2,4-Dichlorophenol.

Some tank pitting has been reported when this cargo is contaminated with water, including moisture in the air. The IMO Chemical Code requires that the vapor space over this cargo be kept dry.

5. Reserved.

6. Diphenylmethane diisocyanate; Isophorone diisocyanate; Polymethylene polyphenyl isocyanate; Toluene diisocyanate; Trimethylhexamethylene diisocyanate (2,2,4- and 2,4,4- isomers).

Water is effective in extinguishing open air fires but will generate hazardous quantities of gas if put on the cargo in enclosed spaces.

7. Maleic anhydride; Nitroethane; 1- or 2-Nitropropane; Nitropropane, Nitroethane mixtures.

Dry chemical extinguishers should not be used on fires involving these cargoes since some dry chemicals may react with the cargo and cause an explosion.

8. Xylenes.

Special requirement .908(b) only applies to the para- (p-) isomer, and mixtures containing the para-isomer having a melting point of 0 deg C (32 deg F) or more.

[CGD 92–100, 59 FR 17028, Apr. 11, 1994, as amended by CGD 94–900, 59 FR 45139, Aug. 31, 1994; CGD 94–902, 60 FR 34043, June 29, 1995; CGD 95–900, 60 FR 34050, 34051, June 29, 1995; 60 FR 39267, Aug. 2, 1995]

TABLE 2—CARGOES NOT REGULATED UNDER SUBCHAPTERS D OR O OF THIS CHAPTER WHEN CARRIED IN BULK ON NON-OCEANGOING BARGES

The cargoes listed in this table are not regulated under subchapter D or O of this title when carried in bulk on non-oceangoing barges. Category A, B, or C noxious liquid substance (NLS) cargo, as defined in §153.2 of this chapter, listed in this table, or any mixture containing one or more of these cargoes, must be carried under this subchapter if carried in bulk on an oceangoing ship. Requirements for Category D NLS cargoes and mixtures of non-NLS cargoes with Category D NLS cargoes are in 33 CFR part 151.

Cargoes	Pollution Category
2-Amino-2-hydroxymethyl-1,3-propanediol solution.	III
•Ammonium hydrogen phosphate solution	**D**
Ammonium lignosulfonate solution, *see also* Lignin liquor.	III
Ammonium nitrate solution (45% or less)	D
•Ammonium nitrate, Urea solution (2% or less NH_3), *see also* **Urea, Ammonium nitrate solution (2% or less NH_3)**.	D
•Ammonium phosphate, Urea solution, *see also* **Urea, Ammonium phosphate solution**.	D
•Ammonium polyphosphate solution	**D**
Ammonium sulfate solution (20% or less)	D
Apple juice	III
Calcium bromide solution	III
Calcium carbonate slurry	III
Calcium chloride solution	III
Calcium hydroxide slurry	D
Calcium lignosulfonate solution, *see also* Lignin liquor.	III
Calcium nitrate, Magnesium nitrate, Potassium chloride solution.	III
Caramel solutions	III
Chlorinated paraffins (C14–C17) (with 52% Chlorine).	III
2-Chloro-4-ethylamino-6-isopropylamino-5-triazine solution.	#
Choline chloride solution	D
Clay slurry	III
Coal slurry	III
Dextrose solution	III
Diethylenetriamine pentaacetic acid, pentasodium salt solution.	III
1,4-Dihydro-9,10-dihydroxy anthracene, disodium salt solution.	D
Dodecenylsuccinic acid, dipotassium salt solution.	D
Drilling brine (containing Calcium, Potassium, or Sodium salts) (*see also* Potassium chloride solution (10% or more)).	
•Drilling brine (containing Zinc salts)	**B**
Drilling mud (low toxicity) *(if non-flammable and non-combustible).*	[III]
Ethylenediaminetetraacetic acid, tetrasodium salt solution.	D
Ethylene-Vinyl acetate copolymer *(emulsion)*	III
Ferric hydroxyethylethylenediamine triacetic acid, trisodium salt solution.	D
•Fish solubles *(water based fish meal extracts)*	**III**
Fructose solution	#
Glucose solution	III
Glycine, sodium salt solution	III
•Hexamethylenediamine adipate *solution*	D
N-(Hydroxyethyl)ethylenediamine triacetic acid, trisodium salt solution.	D
Kaolin clay solution	III
Kaolin slurry	III
Kraft pulping liquor (free alkali content, 1% or less) *including: Black, Green, or White liquor.*	#
Lignin liquor (free alkali content, 1% or less) *including*:.	#
Ammonium lignosulfonate solution	III
Calcium lignosulfonate solution	III
Sodium lignosulfonate solution	III
Lignin sulfonic acid, sodium salt solution	III
Magnesium chloride solution	III
Magnesium hydroxide slurry	III
Milk	III
Molasses	III
Molasses residue *(from fermentation)*	[III]
Naphthenic acid, sodium salt solution	**[A]**
Noxious liquid, N.F., (1) n.o.s. (''trade name'' contains ''principle components'') ST 1, Cat A *(if non-flammable or non-combustible).*	A
Noxious liquid, N.F., (3) n.o.s. (''trade name'' contains ''principle components'') ST 2, Cat A *(if non-flammable or non-combustible).*	A
Noxious liquid, N.F., (5) n.o.s. (''trade name'' contains ''principle components'') ST 2, Cat B *(if non-flammable or non-combustible).*	B
Noxious liquid, N.F., (6) n.o.s. (''trade name'' contains ''principle components'') ST 2, Cat B, mp. equal to or greater than 15 deg. C *(if non-flammable or non-combustible).*	B
Noxious liquid, N.F., (9) n.o.s. (''trade name'' contains ''principle components'') ST 3, Cat A *(if non-flammable or non-combustible).*	A
Noxious liquid, N.F., (11) n.o.s. (''trade name'' contains ''principle components'') ST 3, Cat B *(if non-flammable or non-combustible).*	B
Noxious liquid, N.F., (12) n.o.s. (''trade name'' contains ''principle components'') ST 3, Cat B, mp. equal to or greater than 15 deg. C *(if non-flammable or non-combustible).*	B
Noxious liquid, N.F., (15) n.o.s. (''trade name'' contains ''principle components'') ST 3, Cat C *(if non-flammable or non-combustible).*	C
Noxious liquid, n.o.s. (17) (''trade name,'' contains ''principal components''), Category D *(if non-flammable or non-combustible).*	D
Non-noxious liquid, n.o.s. (18) (''trade name,'' contains ''principal components''), Appendix III *(if non-flammable or non-combustible).*	III
Pentasodium salt of Diethylenetriamine pentaacetic acid solution, *see* Diethylenetriamine pentaacetic acid, pentasodium salt solution.	III
Polyaluminum chloride solution	III
Potassium chloride solution (10% or more)(*see also the drilling brines entry.*	III
Sewage sludge, treated *(treated so as to pose no additional decompositional and fire hazard; stable, non-corrosive, non-toxic, non-flammable).*	#
Silica slurry	[III]
Sludge, treated *(treated so as to pose no additional decompositional and fire hazard; stable, non-corrosive, non-toxic, non-flammable).*	#
Sodium acetate, Glycol, Water mixture (containing 1% or less, Sodium hydroxide) *(if non-flammable or non-combustible).*	#
Sodium aluminosilicate slurry	III

Cargoes	Pollution Category
Sodium carbonate solution	D
Sodium lignosulfonate solution, *see also* Lignin liquor.	III
Sodium naphthenate solution (free alkali content, 3% or less), *see* Naphthenic acid, sodium salt solution.	**[A]**
•Sodium **poly(4+)acrylate** solution	**III**
•Sodium silicate solution	**C**
•Sodium sulfate solution	**III**
Sorbitol solution	III
Tetrasodium salt of Ethylenediaminetetraacetic acid solution, *see* Ethylenediaminetetraacetic acid, tetrasodium salt solution.	D
1,1,1-Trichloroethane	**C**
1,1,2-Trichloro-1,2,2-trifluoroethane	C
Trisodium salt of N-(Hydroxyethyl)-ethylenediaminetriacetic acid solution, *see* N-(Hydroxyethyl)ethylenediamine triacetic acid, trisodium salt solution.	D
Urea, Ammonium mono- and di-hydrogen phosphate, Potassium chloride solution.	D
•Urea, Ammonium nitrate solution (2% or less NH_3), *see also* Ammonium nitrate, Urea solution (2% or less).	D
•Urea, Ammonium phosphate solution, *see also* Ammonium phosphate, Urea solution.	D
Urea solution	III
Vanillan black liquor (free alkali content, 1% or less).	#
Vegetable protein solution *(hydrolysed)*	III
Water	III
•*Zinc bromide, Calcium bromide solution, see* Drilling brine (containing Zinc salts).	

Items with a bullet (•) or in **boldface** are changes since October 1, 1993.

Explanation of Symbols: As used in this table, the following stand for:

A, B, C, D—NLS Category of Annex II of MARPOL 73/78.

I—Considered an ''oil'' under Annex I of MARPOL 73/78.

III—Appendix III of Annex II (non-NLS cargoes) of MARPOL 73/78.

LFG—Liquefied flammable gas.

#—No determination of NLS status. For shipping on an oceangoing vessel, see 46 CFR 153.900(c).

[ ]—A NLS category in brackets indicates that the product is provisionally categorized and that further data are necessary to complete the evaluation of its pollution hazards. Until the hazard evaluation is completed, the pollution category assigned is used.

@The NLS category has been assigned by the U.S. Coast Guard, in absence of one assigned by the IMO. The category is based upon a GESAMP Hazard Profile or by analogy to a closely related product having an NLS assigned.

Abbreviations for Noxious liquid Cargoes:

N.F.—non-flammable (flash point greater than 60 degrees C (140 degrees F) cc).
n.o.s.—not otherwise specified.
ST—Ship type.
Cat—Pollution category.

[CGD 88–100, 54 FR 43584, Oct. 26, 1989; CGD 92–100, 59 FR 17044, Apr. 11, 1994, as amended by CGD 94–900, 59 FR 45142, Aug. 31, 1994; CGD 94–902, 60 FR 34043, June 29, 1995; CGD 95–900, 60 FR 34052, June 29, 1995]

APPENDIX I [RESERVED]

APPENDIX II—METRIC UNITS USED IN PART 153

Parameter	Metric (SI unit)	Abbreviation	Equivalent to English or common metric
Force	Newton	N	0.225 lbs.
Length	Meter	m	39.37 in.
	Centimeter	cm	.3937 in.
Pressure	Pascal	Pa	1.450×10^{-4} lbs/in^2.
	Kilo-Pascal (1,000 Pascals).	kPa	0.145 lbs/in^2.
	Kilo-Pascal	kPa	1.02×10^{-2} kg/cm^2.
	....do	kPa	1×10^3 N/m^2.
Temperature	Degree Celsius	° C	5/9 (°F–32).
Viscosity	milli-Pascal second.	mPa. sec.	1.0 centipoise.
Volume	Cubic meter	m^3	264 gallons (gal).
	....do	m^3	35.3 ft^3.

[CGD 73–96, 42 FR 49027, Sept. 26, 1977, as amended by CGD 78–128, 47 FR 21212, May 17, 1982; CGD 81–101, 52 FR 7799, Mar. 12, 1987. Redesignated by CGD 92–100, 59 FR 17045, Apr. 11, 1994]

PART 154—SAFETY STANDARDS FOR SELF-PROPELLED VESSELS CARRYING BULK LIQUEFIED GASES

Subpart A—General

Sec.

154.1 Incorporation by reference.
154.3 Purpose.
154.5 Applicability.
154.7 Definitions, acronyms, and terms.
154.9 Issuance of documents.
154.12 Existing gas vessel: Endorsements and requirements.
154.15 U.S. flag vessel: Endorsement application.
154.17 U.S. flag vessel: Certificate of Inspection endorsement.
154.19 U.S. flag vessel: IMO certificate issuance.
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154.30 Liquefied gases not included in Table 4.
154.32 Equivalents.
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154.36 Correspondence and vessel information: Submission.
154.40 Right of appeal.