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Subpart E—Portable Fire Extinguishers

§ 118.500 Required number, type, and location.

(a) Each portable fire extinguisher on a vessel must be of a type approved by the Commandant. The minimum number of portable fire extinguishers required on a vessel must be acceptable to the cognizant OCMI, but must be not less than the minimum number required by table 1 to §118.500(b) and other provisions of this section.

(b)Table 1 to §118.500(b) indicates the minimum required number and type of extinguisher for each space listed. Extinguishers with larger numerical ratings or multiple letter designations may be used if the extinguishers meet the requirements of the table.

TABLE 118.500(b)—REQUIRED PORTABLE FIRE EXTINGUISHERS

Space	Minimum required rating	Quantity and location
Operating station	10–B:C	1.
Machinery space	40–B:C	1 in the vicinity of the exit.
Open vehicle deck	40–B	1 for every 10 vehicles.
Accommodation space	2–A	1 each for each 2,500 sq ft or fraction thereof.
Galley	40–B:C	1.
Pantry, concession stand	2–A	1 in the vicinity of the exit.

(c) A vehicle deck without a fixed sprinkler system and exposed to weather must have one 40–B portable fire extinguisher for every 5 vehicles, located near an entrance to the space.

(d) The frame or support of each semi-portable fire extinguisher permitted by paragraph (b) of this section must be welded or otherwise permanently attached to a bulkhead or deck.

[USCG–2012–0196, 81 FR 48270, July 22, 2016, as amended by USCG–2020–0519, 89 FR 76701, Sept. 18, 2024]

§ 118.520 Installation and location.

Portable fire extinguishers must be located so that they are clearly visible and readily accessible from the space being protected. The installation and location must be to the satisfaction of the cognizant OCMI.

Subpart F—Additional Equipment

§ 118.600 Fire axe.

A vessel of more than 19.8 meters (65 feet) in length must have at least one fire axe located in or adjacent to the primary operating station.

PART 119—MACHINERY INSTALLATION

Subpart A—General Provisions

Sec.

119.100 Intent; preemptive effect.
119.115 Applicability to existing vessels.

Subpart B—Propulsion Machinery

119.200 General.
119.220 Installations.

Subpart C—Auxiliary Machinery

119.310 Installations.
119.320 Water heaters.
119.330 Pressure vessels.

Subpart D—Specific Machinery Requirements

119.400 Applicability.
119.405 Fuel restrictions.
119.410 General requirements.
119.420 Engine cooling.
119.422 Integral and non-integral keel cooler installations.
119.425 Engine exhaust cooling.
119.430 Engine exhaust pipe installation.
119.435 Integral fuel tanks.
119.440 Independent fuel tanks.
119.445 Fill and sounding pipes for fuel tanks.
119.450 Vent pipes for fuel tanks.
119.455 Fuel piping.
119.458 Portable fuel systems.
119.465 Ventilation of spaces containing diesel machinery.

119.470 Ventilation of spaces containing diesel fuel tanks.

Subpart E—Bilge and Ballast Systems

119.500 General.
119.510 Bilge piping system.
119.520 Bilge pumps.
119.530 Bilge high level alarms.
119.540 Ballast systems.

Subpart F—Steering Systems

119.600 General.

Subpart G—Piping Systems

119.700 General.
119.710 Piping for vital systems.
119.715 Piping subject to more than 1,034 kPa (150 psig) in non-vital systems.
119.720 Nonmetallic piping materials.
119.730 Nonferrous metallic piping materials.

AUTHORITY: 46 U.S.C. 2103, 3306; E.O. 12234, 45 FR 58801, 3 CFR, 1980 Comp., p. 277; DHS Delegation No. 00170.1, Revision No. 01.3.

SOURCE: CGD 85–080, 61 FR 922, Jan. 10, 1996, unless otherwise noted.

Subpart A—General Provisions

§ 119.100 Intent; preemptive effect.

This part contains requirements for the design, construction, installation, and operation of propulsion and auxiliary machinery, piping and pressure systems steering apparatus, and associated safety systems. Machinery and equipment installed on each vessel must be suitable for the vessel and its operation and for the purpose intended. The regulations in this part have preemptive effect over State or local regulations in the same field.

[CGD 85–080, 61 FR 922, Jan. 10, 1996, as amended by USCG–2006–24797, 77 FR 33883, June 7, 2012]

§ 119.115 Applicability to existing vessels.

(a) Except as otherwise required by paragraphs (b) and (c) of this section, an existing vessel must comply with the regulations on machinery, bilge and ballast system equipment, steering apparatus, and piping systems or components that were applicable to the vessel on March 10, 1996, or, as an alternative, the vessel may comply with the regulations in this part.

(b) New installations of machinery, bilge and ballast system equipment, steering equipment, and piping systems or components on an existing vessel, which are completed to the satisfaction of the cognizant Office in Charge, Marine Inspection (OCMI) on or after March 11, 1996, must comply with the regulations of this part. Replacement of existing equipment installed on the vessel prior to March 11, 1996, need not comply with the regulations in this part.

(c) An existing vessel must comply with the bilge high level alarm requirements in § 119.530 of this section.

[CGD 85–080, 61 FR 922, Jan. 10, 1996; 61 FR 20556, May 7, 1996; USCG–2023–0759, 89 FR 22949, Apr. 3, 2024]

Subpart B—Propulsion Machinery

§ 119.200 General.

(a) Propulsion machinery must be suitable in type and design for propulsion requirements of the hull in which it is installed and capable of operating at constant marine load under such requirements without exceeding its designed limitations.

(b) All engines must have at least two means for stopping the engine(s) under any operating conditions. The fuel oil shutoff required at the engine by § 119.455(b)(3) of this part will satisfy one means of stopping the engine.

§ 119.220 Installations.

(a) The installation requirements for machinery and boilers for steam and electrically propelled vessels are contained in applicable regulations in subchapter F (Marine Engineering) and subchapter J (Electrical Engineering) of this chapter.

(b) Installation of propulsion machinery of an unusual type for small passenger vessels must be given separate consideration and must be subject to such requirements as determined necessary by the cognizant OCMI. Unusual types of propulsion machinery include:

(1) Gas turbine machinery installations;

(2) Air screws;

(3) Hydraulic jets; and

(4) Machinery installations using lift devices.

Subpart C—Auxiliary Machinery

§ 119.310 Installations.

(a) Auxiliary machinery of the internal combustion piston type must comply with the provisions of this part.

(b) Auxiliary machinery of the steam or gas turbine type will be given separate consideration and must meet the applicable requirements of subchapter F (Marine Engineering) of this chapter as determined necessary by the cognizant OCMI.

(c) Auxiliary boilers and heating boilers and their associated piping and fittings will be given separate consideration and must meet the applicable requirements of subchapter F (Marine Engineering) of this chapter as determined necessary by the cognizant OCMI, except that heating boilers must be tested or examined every three years.

§ 119.320 Water heaters.

(a) A water heater must meet the requirements of Parts 53 and 63 in subchapter F of this chapter if rated at not more than 689 kPa (100 psig) and 121 °C (250 °F), except that an electric water heater is also acceptable if it:

(1) Has a capacity of not more than 454 liters (120 gallons):

(2) Has a heat input of not more than 58.6 kilowatts (200,000 Btu per hour);

(3) Is listed by Underwriters Laboratories (UL) under UL 174, ''Household Electric Storage Tank Water Heaters,'' UL 1453, ''Electric Booster and Commercial Storage Tank Water Heaters,'' or other standard specified by the Commandant; and

(4) Is protected by a pressure-temperature relief device.

(b) A water heater must meet the requirements of Parts 52 and 63 in subchapter F of this chapter if rated at more than 689 kPa (100 psig) or 121 °C (250 °F).

(c) A water heater must be installed and secured from rolling by straps or other devices to the satisfaction of the cognizant OCMI.

[CGD 85–080, 61 FR 922, Jan. 10, 1996, as amended at 62 FR 51352, Sept. 30, 1997]

§ 119.330 Pressure vessels.

All unfired pressure vessels must be installed to the satisfaction of the cognizant OCMI. The design, construction, and original testing of such unfired pressure vessels must meet the applicable requirements of subchapter F (Marine Engineering) of this chapter.

Subpart D—Specific Machinery Requirements

§ 119.400 Applicability.

(a) This subpart applies to all propulsion and auxiliary machinery installations of the internal combustion piston type.

(b) Where no specific fuel designation exists, the requirements of this subpart are applicable to all types of fuels and machinery.

§ 119.405 Fuel restrictions.

The use of a fuel, other than diesel fuel, as an alternative fuel for an internal combustion engine, except gasoline when used as a fuel for outboard motors as allowed by § 119.458 of this part, will be reviewed on a case-by-case basis by the Commandant.

[CGD 85–080, 61 FR 922, Jan. 10, 1996, as amended by CGD 97–057, 62 FR 51047, Sept. 30, 1997]

§ 119.410 General requirements.

(a) Each starting motor, generator, and spark producing device must be mounted as high above the bilges as practicable.

(b) Gauges to indicate engine revolutions per minute (RPM), jacket water discharge temperature, and lubricating oil pressure must be provided for all propulsion engines installed in the vessel. The gauges must be readily visible at the operating station.

(c) In systems and applications where flexible hoses are permitted to be clamped:

(1) Double hose clamping is required on each end of the hose, where practicable, except that one hose clamp can be used if the pipe ends are expanded or beaded to provide a positive stop against hose slippage;

(2) The clamps must be of a corrosion resistant metallic material; and

(3) The clamps must not depend on spring tension for their holding power.

§ 119.420 Engine cooling.

(a) Except as otherwise provided in paragraph (b) of this section, all engines must be water cooled and meet the requirements of this paragraph.

(1) The engine head, block, and exhaust manifold must be water jacketed and cooled by water from a pump that operates whenever the engine is operating.

(2) A suitable hull strainer must be installed in the circulating raw water intake line of an engine cooling water system.

(3) A closed fresh water system may be used to cool the engine.

(b) A propulsion or auxiliary diesel engine may be air cooled or employ an air cooled jacket water radiator when:

(1) Installed on an open deck and sufficient ventilation for machinery cooling is available; or

(2) Installed in an enclosed or partially enclosed space for which ventilation for machinery cooling that complies with the requirement of §119.465(b) of this part is provided, and other necessary safeguards are taken so as not to endanger the vessel.

§ 119.422 Integral and non-integral keel cooler installations.

(a) A keel cooler installation used for engine cooling must be designed to prevent flooding.

(b) Except as provided in paragraph (e), a shutoff valve must be located where the cooler piping penetrates the shell, as near the shell as practicable, except where the penetration is forward of the collision bulkhead.

(c) The thickness of the inlet and discharge connections, outboard of the shutoff values required by paragraph (b) of this section, must be at least Schedule 80.

(d) Short lengths of approved nonmetallic flexible hose, fixed by two hose clamps at each end of the hose, may be used at machinery connections for a keel cooler installation.

(e) Shutoff valves are not required for integral keel coolers. A keel cooler is considered integral to the hull if the following conditions are satisfied:

(1) The cooler structure is fabricated from material of the same thickness and quality as the hull;

(2) The flexible connections are located well above the deepest subdivision draft;

(3) The end of the structure is faired to the hull with a slope no greater than 4 to 1; and

(4) Full penetration welds are employed in the fabrication of the structure and its attachment to the hull.

[CGD 85–080, 61 FR 922, Jan. 10, 1996, as amended by USCG–2000–7790, 65 FR 58462, Sept. 29, 2000]

§ 119.425 Engine exhaust cooling.

(a) Except as otherwise provided in this paragraph, all engine exhaust pipes must be water cooled.

(1) Vertical dry exhaust pipes are permissible if installed in compliance with §§116.405(c) and 116.970 of this chapter.

(2) Horizontal dry exhaust pipes are permitted only if:

(i) They do not pass through living or berthing spaces;

(ii) They terminate above the deepest load waterline;

(iii) They are so arranged as to prevent entry of cold water from rough or boarding seas;

(iv) They are constructed of corrosion resisting material at the hull penetration; and

(v) They are installed in compliance with §§116.405(c) and 116.970 of this chapter.

(b) The exhaust pipe cooling water system must comply with the requirements of this paragraph.

(1) Water for cooling the exhaust pipe must be obtained from the engine cooling water system or a separate engine driven pump.

(2) Water for cooling an exhaust pipe, other than a vertical exhaust, must be injected into the exhaust system as near to the engine manifold as practicable. The water must pass through the entire length of the exhaust pipe.

(3) The part of the exhaust system between the point of cooling water injection and the engine manifold must be water-jacketed or effectively insulated and protected in compliance with §§116.400(b) and 116.970 of this chapter.

(4) Each vertical exhaust pipe must be water-jacketed or suitably insulated

between the engine manifold and the spark arrester required by §119.430(g) of this part.

(5) When the exhaust cooling water system is separate from the engine cooling water system, a suitable warning device, visual or audible, must be installed at the operating station to indicate any reduction in normal water flow in the exhaust cooling system.

(6) A suitable hull strainer must be installed in the circulating raw water intake line for the exhaust cooling system.

(c) Engine exhaust cooling systems built in accordance with the requirements of American Boat and Yacht Council (ABCY) P–1, ''Installation of Exhaust Systems for Propulsion and Auxiliary Engines,'' will be considered as meeting the requirements of this section.

§119.430 Engine exhaust pipe installation.

(a) The design of all exhaust systems must ensure minimum risk of injury to personnel. Protection must be provided in compliance with §116.970 of this chapter at such locations where persons or equipment might come in contact with an exhaust pipe.

(b) Exhaust gas must not leak from the piping or any connections. The piping must be properly supported by noncombustible hangers or blocks.

(c) The exhaust piping must be so arranged as to prevent backflow of water from reaching engine exhaust ports under normal conditions.

(d) Pipes used for wet exhaust lines must be at least Schedule 80 or corrosion resistant material and adequately protected from mechanical damage.

(e) Where flexibility is necessary, a section of flexible metallic hose may be used. Nonmetallic hose may be used for wet exhaust systems provided it is especially adapted to resist the action of oil, acid, and heat, and has a wall thickness sufficient to prevent collapsing or panting, and is double clamped where practicable.

(f) Where an exhaust pipe passes through a watertight bulkhead, the watertight integrity of the bulkhead must be maintained. Noncombustible packing must be used in bulkhead penetration glands for dry exhaust systems. A wet exhaust pipe may be welded to a steel or equivalent bulkhead in way of a penetration if suitable arrangements are provided to relieve the stresses resulting from the expansion of the exhaust piping.

(g) A dry exhaust pipe must:

(1) If it passes through a combustible bulkhead or partition, be kept clear of, and suitably insulated or shielded from, combustible material.

(2) Be provided with noncombustible hangers and blocks for support.

(h) An exhaust pipe discharge terminating in a transom must be located as far outboard as practicable so that exhaust gases cannot reenter the vessel.

(i) Arrangements must be made to provide access to allow complete inspection of the exhaust piping throughout its length.

(j) An exhaust installation subject to pressures in excess of 105 kPa (15 psig) or having exhaust pipes passing through living or working spaces must meet the material requirements of part 56 of subchapter F (Marine Engineering) of this chapter.

(k) Engine exhaust installations built in accordance with the requirements of ABYC P–1 will be considered as meeting the requirements of this section.

[CGD 85–080, 61 FR 922, Jan. 10, 1996, as amended at 62 FR 51352, Sept. 30, 1997]

§119.435 Integral fuel tanks.

(a) Diesel fuel tanks may not be built integral with the hull of a vessel unless the hull is made of steel or aluminum.

(b) During the initial inspection for certification of a vessel, integral fuel tanks must withstand a hydrostatic pressure test of 35 kPa (5 psig), or the maximum pressure head to which they may be subjected in service, whichever is greater. A standpipe of 3.5 meters (11.5 feet) in height attached to the tank may be filled with water to accomplish the 35 kPa (5 psig) test.

§119.440 Independent fuel tanks.

(a) *Materials and construction.* Independent fuel tanks must be designed and constructed of materials in compliance with the requirements of this paragraph.

(1) The material used and the minimum thickness allowed must be as indicated in Table 119.440(a)(1), except

that other materials which provide equivalent safety may be approved for use under paragraph (a)(3) of this section. Tanks having a capacity of more than 570 liters (150 gallons) must be designed to withstand the maximum head to which they may be subjected in service, but in no case may the thickness be less than that specified in Table 119.440(a)(1).

TABLE 119.440(a)(1)

Material	ASTM Specification (latest edition) [see also § 114.600 of this chapter]	Thickness in millimeters (inches) & [gage number][1] vs. tank capacities for:		
		4 to 300 liter (1 to 80 gal) tanks	More than 300 liter (80 gal) and not more than 570 liter (150 gal) tanks	Over 570 liter (150 gal)[2] tanks
Nickel-copper.	B127, hot rolled sheet or plate.	0.94 (0.037) [USSG 20][3]	1.27 (0.050) [USSG 18]	2.72 (0.107) [USSG 12]
Copper-nickel[4].	B122, UNS alloy C71500.	1.14 (0.045) [AWG 17]	1.45 (0.057) [AWG 15]	3.25 (0.128) [AWG 8]
Copper[4]	B152, UNS alloy C11000.	1.45 (0.057) [AWG 15]	2.06 (0.081) [AWG 12]	4.62 (0.182) [AWG 5]
Copper-silicon[4].	B 96, alloys C65100 and C65500.	1.29 (0.051) [AWG 16]	1.63 (0.064) [AWG 14]	3.66 (0.144) [AWG 7]
Steel or iron[5 6].	.....	1.90 (0.0747) [MSG 14]	2.66 (0.1046) [MSG 12]	4.55 (0.1793) [MSG 7]
Aluminum[7]	B209, alloy 5052, 5083, 5086.	6.35 (0.250) [USSG 3]	6.35 (0.250) [USSG 3]	6.35 (0.250) [USSG 3]
Fiber reinforced plastic.	.....	as required[8]	as required[8]	as required[8]

[1] The gage numbers used in this table may be found in many standard engineering reference books. The letters ''USSG'' stand for ''U.S. Standard Gage,'' which was established by the act of March 3, 1892 (15 U.S.C. 206), for sheet and plate iron and steel. The letters ''AWG'' stand for ''American Wire Gage'' (or Brown and Sharpe Gage) for nonferrous sheet thicknesses. The letters ''MSG'' stand for ''Manufacturers' Standard Gage'' for sheet steel thickness.

[2] Tanks over 1514 liters (400 gallons) shall be designed with a factor of safety of four on the ultimate strength of the material used with a design held of not less than 1220 millimeters (4 feet) of liquid above the top of the tank.

[3] Nickel-copper not less than 0.79 millimeter (0.031 inch) [USSG 22] may be used for tanks up to 114- liter (30-gallon) capacity.

[4] Acceptable only for gasoline service.

[5] Gasoline fuel tanks constructed of iron or steel, which are less than 5 millimeter (0.1875 inch) thick, shall be galvanized inside and outside by the hot dip process. Tanks intended for use with diesel oil shall not be internally galvanized.

[6] Stainless steel tanks are not included in this category.

[7] Anodic to most common metals. Avoid dissimilar metal contact with tank body.

[8] The requirements of § 119.440(a)(2) apply.

(2) Fiber reinforced plastic may be used for diesel fuel tanks under the following provisions:

(i) The materials must be fire retardant. Flammability of the material must be determined by the standard test methods in American Society for Testing and Materials (ASTM) D635, ''Rate of Burning and/or Extent and Time of Burning of Self-Supporting Plastics in a Horizontal Position,'' and ASTM D2863, ''Measuring the Minimum Oxygen Concentration to Support Candle-like Combustion of Plastics (Oxygen Index),'' or other standard specified by the Commandant. The results of these tests must show that the average extent of burning is less than 10 millimeters (0.394 inches), the average time of burning is less than 50 seconds, and the limiting oxygen index is greater than 21.

(ii) Tanks must meet UL 1102, ''Nonintegral Marine Fuel Tanks,'' or other standard specified by the Commandant. Testing may be accomplished by an independent laboratory or by the fabricator to the satisfaction of the cognizant OCMI.

(iii) Tanks must be designed to withstand the maximum head to which they may be subjected to in service.

(iv) Installation of nozzles, flanges or other fittings for pipe connections to the tanks must be acceptable to the cognizant OCMI.

(v) Baffle plates, if installed, must be of the same material and not less than the minimum thickness of the tank walls. Limber holes at the bottom and air holes at the top of all baffles must be provided. Baffle plates must be installed at the time the tests required by UL 1102, or other standard specified by the Commandant, are conducted.

(3) Materials other than those listed in Table 119.440(a)(1) must be approved by the Commandant. An independent tank using material approved by the Commandant under this paragraph must meet the testing requirements of UL 1102, or other standard specified by the Commandant. Testing may be accomplished by an independent laboratory or by the fabricator to the satisfaction of the OCMI.

(4) Tanks with flanged-up top edges that may trap and hold moisture are prohibited.

(5) Openings for fill pipes, vent pipes, and machinery fuel supply pipes, and openings for fuel level gauges, where used, must be on the topmost surfaces of tanks. Tanks may not have any openings in bottoms, sides, or ends, except for:

(i) An opening fitted with a threaded plug or cap installed for tank cleaning purposes; and

(ii) In a diesel fuel tank, openings for supply piping and tubular gauge glasses.

(6) All tank joints must be welded or brazed. Lap joints may not be used.

(7) Nozzles, flanges, or other fittings for pipe connections to a metal tank must be welded or brazed to the tank. Tank openings in way of pipe connections must be properly reinforced where necessary. Where fuel level gauges are used on a metal tank, the flanges to which gauge fittings are attached must be welded or brazed to the tank. Tubular gauge glasses, if fitted to diesel fuel tanks, must be of heat resistant materials, adequately protected from mechanical damage, and provided at the tank connections with devices that will automatically close in the event of rupture of the gauge or gauge lines.

(8) A metal tank exceeding 760 millimeters (30 inches) in any horizontal dimension must:

(i) Be fitted with vertical baffle plates, which meet paragraph (a)(9) of this section, at intervals not exceeding 760 millimeters (30 inches) to provide strength and to control the excessive surge of fuel; or

(ii) The owner shall submit calculations to the Commanding Officer, Marine Safety Center demonstrating the structural adequacy of the tank in a fully loaded static condition and in a worst case dynamic (sloshing) condition.

(9) Baffle plates, where required in metal tanks, must be of the same material and not less than the minimum thickness required in the tank walls and must be connected to the tank walls by welding or brazing. Limber holes at the bottom and air holes at the top of all baffles must be provided.

(10) Iron or steel diesel fuel tanks must not be galvanized on the interior. Galvanizing, paint, or other suitable coating must be used to protect the outside of iron and steel diesel fuel tanks.

(b) *Location and installation.* Independent fuel tanks must be located and installed in compliance with the requirements of this paragraph.

(1) Fuel tanks must be located in, or as close as practicable to, machinery spaces.

(2) Fuel tanks and fittings must be so installed as to permit examination, testing, or removal for cleaning with minimum disturbance to the hull structure.

(3) Fuel tanks must be adequately supported and braced to prevent movement. The supports and braces must be insulated from contact with the tank surfaces with a nonabrasive and nonabsorbent material.

(4) All fuel tanks must be electrically bonded to a common ground.

(c) *Tests.* Independent fuel tanks must be tested in compliance with the requirements of this part prior to being used to carry fuel.

(1) Prior to installation, tanks vented to the atmosphere must be hydrostatically tested to, and must withstand, a pressure of 35 kPa (5 psig) or 1.5 times the maximum pressure head to which they may be subjected in service, whichever is greater. A standpipe of 3.5 meters (11.5 feet) in height attached to the tank may be filled with water to accomplish the 35 kPa (5 psig) test. Permanent deformation of the tank will not be cause for rejection unless accompanied by leakage.

(2) After installation of the fuel tank on a vessel, the complete installation must be tested in the presence of a marine inspector, or an individual specified by the cognizant OCMI, to a head

not less than that to which the tank may be subjected in service. Fuel may be used as the testing medium.

(3) All tanks not vented to the atmosphere must be constructed and tested in accordance with §119.330 of this part.

[CGD 85–080, 61 FR 922, Jan. 10, 1996, as amended by USCG–1999–5151, 64 FR 67183, Dec. 1, 1999]

§ 119.445 Fill and sounding pipes for fuel tanks.

(a) Fill pipes for fuel tanks must be not less than 40 millimeters (1.5 inches) nominal pipe size.

(b) There must be a means of accurately determining the amount of fuel in each fuel tank either by sounding, through a separate sounding pipe or a fill pipe, or by an installed marine type fuel gauge.

(c) Where sounding pipes are used, each opening must be at least as high as the opening of the fill pipe and they must be kept closed at all times except during sounding.

(d) Fill pipes and sounding pipes must be so arranged that overflow of liquid or vapor cannot escape to the inside of the vessel.

(e) Fill pipes and sounding pipes must run as directly as possible, preferably in a straight line, from the deck connection to the top of the tank. Such pipes must terminate on the weather deck and must be fitted with shutoff valves, watertight deck plates, or screw caps, suitably marked for identification. Diesel fill pipes and sounding pipes may terminate at the top of the tank.

(f) Where a flexible fill pipe section is necessary, suitable flexible tubing or hose having high resistance to salt water, petroleum oils, heat and vibration, may be used. Such hose must overlap metallic pipe ends at least 1.5 times the pipe diameter and must be secured at each end by clamps. The flexible section must be accessible and as near the upper end of the fill pipe as practicable. When the flexible section is a nonconductor of electricity, the metallic sections of the fill pipe separated thereby must be joined by a conductor for protection against generation of a static charge when filling with fuel.

[CGD 85–080, 61 FR 922, Jan. 10, 1996; 61 FR 20556, May 7, 1996]

§ 119.450 Vent pipes for fuel tanks.

(a) Each unpressurized fuel tank must be fitted with a pipe connected to the highest point of the tank.

(b) The minimum net cross sectional area of the vent pipe for diesel fuel tanks must be as follows:

(1) Not less than the cross sectional area of 16 millimeters (0.625 inches) outer diameter (O.D.) tubing (0.9 millimeter (0.035 inch) wall thickness, 20 gauge), if the fill pipe terminates at the top of the tank;

(2) Not less than the cross sectional area of 19 millimeters (0.75 inches) O.D. tubing (9.8 millimeter (0.035) inch) wall thickness, 20 gauge), if the fill pipe extends into the tank; and

(3) Not less than the cross sectional area of the fill pipe if the tank is filled under pressure.

(c) The discharge ends of fuel tank vent pipes must terminate on the hull exterior as high above the waterline as practicable and remote from any hull openings, or they must terminate in U-bends as high above the weather deck as practicable and as far as practicable from opening into any enclosed spaces. Vent pipes terminating on the hull exterior must be installed or equipped to prevent the accidental contamination of the fuel by water under normal operating conditions.

(d) The discharge ends of fuel tank vent pipes must be fitted with removable flame screens or flame arresters. The flame screens must consist of a single screen of corrosion resistant wire of at least 30×30 mesh. The flame screens or flame arresters must be of such size and design as to prevent reduction in the net cross sectional area of the vent pipe and permit cleaning or renewal of the flame screens or arrester elements.

(e) Where a flexible vent pipe section is necessary, suitable flexible tubing or hose having high resistance to salt water, petroleum oils, heat and vibration, may be used. Such hose must overlap metallic pipe ends at least 1.5 times the pipe diameter and must be secured at each end by clamps. The

flexible section must be accessible and as near the upper end of the vent pipe as practicable.

(f) Fuel tank vent pipes shall be installed to gradient upward to prevent fuel from being trapped in the line.

§ 119.455 Fuel piping.

(a) *Materials and workmanship.* The materials and construction of fuel lines, including pipe, tube, and hose, must comply with the requirements of this paragraph.

(1) Fuel lines must be annealed tubing of copper, nickel-copper, or copper-nickel having a minimum wall thickness of 0.9 millimeters (0.35 inches) except that:

(i) Diesel fuel piping of other materials, such as seamless steel pipe or tubing, which provide equivalent safety may be used;

(ii) Diesel fuel piping of aluminum is acceptable on aluminum hull vessels provided it is at least Schedule 80; and

(iii) When used, flexible hose must meet the requirements of §56.60–25 in subchapter F of this chapter.

(2) Tubing connections and fittings must be of nonferrous drawn or forged metal of the flared type except that flareless fittings of the nonbite type may be used when the tubing system is of nickel-copper or copper-nickel. When making tube connections, the tubing must be cut square and flared by suitable tools. Tube ends must be annealed before flaring.

(3) Cocks are prohibited except for the solid bottom type with tapered plugs and union bonnets.

(b) *Installation.* The installation of fuel lines, including pipe, tube, and hose, must comply with the requirements of this paragraph.

(1) Diesel fuel lines may be connected to the fuel tank at or near the bottom of the tank.

(2) Fuel lines must be accessible, protected from mechanical injury, and effectively secured against excessive movement and vibration by the use of soft nonferrous metal straps that have no sharp edges and are insulated to protect against corrosion. Where passing through bulkheads, fuel lines must be protected by close fitting ferrules or stuffing boxes. All fuel lines and fittings must be accessible for inspection.

(3) Shutoff valves, installed so as to close against the fuel flow, must be fitted in the fuel supply lines, one at the tank connection and one at the engine end of the fuel line to stop fuel flow when servicing accessories. The shutoff valve at the tank must be manually operable from outside the compartment in which the valve is located, preferably from an accessible position on the weather deck. If the handle to the shutoff valve at the tank is located inside the tank compartment, it must be located so that the operator does not have to reach more than 300 millimeters (12 inches) into the compartment and the valve handle must be shielded from flames by the same material the hull is constructed of, or some noncombustible material. Electric solenoid valves must not be used, unless used in addition to the manual valve.

(4) A loop of copper tubing or a short length of flexible hose must be installed in the fuel supply line at or near the engines. The flexible hose must meet the requirements of §56.60–25 in subchapter F of this chapter.

(5) A suitable metal marine type strainer, meeting the requirements of the engine manufacturer, must be fitted in the fuel supply line in the engine compartment. Strainers must be leak free. Strainers must be of the type opening on top for cleaning screens. Fuel filter and strainer bowls must be highly resistant to shattering due to mechanical impact and resistant to failure due to thermal shock. Fuel filters fitted with bowls of other than steel construction must be approved by the Commandant and be protected from mechanical damage. Approval of bowls of other than steel construction will specify if a flame shield is required.

(6) All accessories installed in the fuel line must be independently supported.

(7) Valves for removing water or impurities from diesel fuel in water traps or strainers are permitted. These valves must be provided with caps or plugs to prevent fuel leakage.

[CGD 85–080, 61 FR 922, Jan. 10, 1996; 61 FR 20556, May 7, 1996]

§ 119.458 Portable fuel systems.

(a) Portable fuel systems, including portable tanks and related fuel lines and accessories, are prohibited except where used for portable dewatering pumps or outboard motor installations.

(b) The design, construction and stowage of portable tanks and related fuel lines and accessories must meet the requirements of ABYC H–25, ''Portable Gasoline Fuel Systems for Flammable Liquids,'' or other standard specified by the Commandant.

[CGD 85–080, 61 FR 922, Jan. 10, 1996, as amended at 62 FR 51352, Sept. 30, 1997]

§ 119.465 Ventilation of spaces containing diesel machinery.

(a) A space containing diesel machinery must be fitted with adequate means, such as dripproof ventilators, ducts, or louvers, to provide sufficient air for proper operation of main engines and auxiliary engines.

(b) Air-cooled propulsion and auxiliary diesel engines installed below deck, as permitted by § 119.420 of this part, must be fitted with air supply ducts or piping from the weather deck. The ducts or piping must be so arranged and supported to be capable of safely sustaining stresses induced by weight and engine vibration and to minimize transfer of vibration to the supporting structure. Prior to installation of ventilation system for such engines, plans or sketches showing machinery arrangement including air supplies, exhaust stack, method of attachment of ventilation ducts to the engine, location of spark arresting mufflers and capacity of ventilation blowers must be submitted to the cognizant OCMI for approval.

(c) A space containing diesel machinery must be fitted with at least two ducts to furnish natural or powered supply and exhaust ventilation. The total inlet area and the total outlet area of each ventilation duct may not be less than one square inch for each foot of beam of the vessel. These minimum areas must be increased as necessary when the ducts are considered as part of the air supply to the engines.

(d) A duct must be of rigid permanent construction, which does not allow any appreciable vapor flow except through normal openings, and made of the same material as the hull or of noncombustible material. The duct must lead as directly as possible from its intake opening to its terminus and be securely fastened and supported.

(e) A supply duct must be provided with a cowl or scoop having a free area not less than twice the required duct area. When the cowl or scoop is screened, the mouth area must be increased to compensate for the area of the screen wire. A cowl or scoop must be kept open at all times except when the weather is such as to endanger the vessel if the openings are not temporarily closed.

(f) Except as required by § 116.610(f) of this chapter, dampers may not be fitted in a supply duct.

(g) A duct opening may not be located where the natural flow of air is unduly obstructed, adjacent to possible sources of vapor ignition, or where exhaust air may be taken into a supply duct.

(h) Provision must be made for closing all supply duct cowls or scoops and exhaust duct discharge openings for a space protected by a fixed gas extinguishing system. All closure devices must be readily available and mounted in the vicinity of the vent.

[CGD 85–080, 61 FR 922, Jan. 10, 1996, as amended at 62 FR 51352, Sept. 30, 1997]

§ 119.470 Ventilation of spaces containing diesel fuel tanks.

(a) Unless provided with ventilation that complies with § 119.465 of this part, a space containing a diesel fuel tank and no machinery must meet one of the following requirements:

(1) A space of 14 cubic meters (500 cubic feet) or more in volume must have a gooseneck vent of not less than 65 millimeters (2.5 inches) in diameter; or

(2) A space of less than 14 cubic meters (500 cubic feet) in volume must have a gooseneck vent of not less than 40 millimeters (1.5 inches) in diameter.

(b) Vent openings may not be located adjacent to possible sources of vapor ignition.

Subpart E—Bilge and Ballast Systems

§ 119.500 General.

(a) A vessel must be provided with a satisfactory arrangement for draining any watertight compartment, other than small buoyancy compartments, under all practicable conditions. Sluice valves are not permitted in watertight bulkheads.

(b) Special consideration may be given to vessels, such as high speed craft, which have a high degree of subdivision and utilize numerous small buoyancy compartments. Where the probability of flooding of the space is limited to external hull damage, compartment drainage may be omitted provided it can be shown by stability calculations, submitted to the cognizant OCMI, that the safety of the vessel will not be impaired.

§ 119.510 Bilge piping system.

A vessel must be provided with a piping system that meets § 56.50–50 in subchapter F of this chapter, with the following exceptions:

(a) The space forward of the collision bulkhead need not be fitted with a bilge suction line when the arrangement of the vessel is such that ordinary leakage may be removed from this compartment by the use of a hand portable bilge pump or other equipment, and such equipment is provided; and

(b) The vessel need not comply with § 56.50–50(f) in subchapter F of this chapter.

[CGD 85–080, 61 FR 922, Jan. 10, 1996, as amended by CGD 97–057, 62 FR 51047, Sept. 30, 1997]

§ 119.520 Bilge pumps.

(a) Each vessel must be provided with bilge pumps in accordance with § 56.50–55 in subchapter F of this chapter, with the following exceptions:

(1) Note 1 in Table 56.50–55(a) is not applicable and should be disregarded; and

(2) A non-self-propelled vessel must comply with § 56.50–55(a) in subchapter F of this chapter instead of § 56.50–55(b).

(b) In addition to the requirements of paragraph (a) of this section, a vessel of not more than 19.8 meters (65 feet) in length must have a portable hand bilge pump that must be:

(1) Capable of pumping water, but not necessarily simultaneously, from all watertight compartments; and

(2) Provided with suitable suction and discharge hoses capable of reaching the bilges of each watertight compartment, and discharging overboard.

(c) A second power pump is an acceptable alternative to a hand pump if it is supplied by a source independent of the first power bilge pump.

§ 119.530 Bilge high level alarms.

(a) Each vessel must be provided with a visual and audible alarm at the operating station to indicate a high water level in each of the following normally unmanned spaces:

(1) A space with a through-hull fitting below the deepest load waterline, such as a lazarette;

(2) A machinery space bilge, bilge well, shaft alley bilge, or other spaces subject to flooding from sea water piping within the space; and

(3) A space with a non-watertight closure , such as a space with a non-watertight hatch on the main deck.

(b) A visual indicator must be provided at the operating station to indicate when any automatic bilge pump is operating.

[CGD 85–080, 61 FR 922, Jan. 10, 1996; 61 FR 20556, May 7, 1996, as amended by USCG–2014–0688, 79 FR 58283, Sept. 29, 2014]

§ 119.540 Ballast systems.

Solid and water ballast must comply with the requirements of subpart L of part 116 of this subchapter.

Subpart F—Steering Systems

§ 119.600 General.

A self-propelled vessel must meet the applicable requirements for main and auxiliary steering apparatus in subchapters F (Marine Engineering) and J (Electrical Engineering) of this chapter.

Subpart G—Piping Systems

§ 119.700 General.

Materials used in piping systems must meet the requirements of this subpart and be otherwise acceptable to the cognizant OCMI.

§ 119.710 Piping for vital systems.

(a) Vital systems are those systems that are vital to a vessel's survivability and safety. For the purpose of this part the following are vital systems:

(1) Fuel systems;

(2) Fire main;

(3) Carbon dioxide, Halon 1301, and clean agent systems;

(4) Bilge system;

(5) Steering system;

(6) Propulsion system and its necessary auxiliaries and controls;

(7) Ship's service and emergency electrical generation system and its necessary auxiliaries; and

(8) A marine engineering system identified by the cognizant OCMI as being crucial to the survival of the vessel or to the protection of the personnel on board.

(b) For the purpose of this part, a system not identified in paragraph (a) of this section is a non-vital system.

(c) Piping used in a vital system must meet §56.60 in subchapter F of this chapter, except that §119.730 of this part replaces §56.60–20 in subchapter F of this chapter.

[CGD 85–080, 61 FR 922, Jan. 10, 1996, as amended by USCG–2006–24797, 77 FR 33883, June 7, 2012]

§ 119.715 Piping subject to more than 1,034 kPa (150 psig) in non-vital systems.

Piping subject to more than 1034 kPa (150 psig) in a non-vital system must be designed, fabricated, and inspected in accordance with the principles of American National Standards Institute (ANSI) B 31.1 ''American National Standard Code for Pressure Piping, Power Piping,'' or other standard specified by the Commandant.

§ 119.720 Nonmetallic piping materials.

Nonmetallic piping materials, including nonmetallic flexible hose assemblies, must meet the requirements of §56.60–25 in subchapter F of this chapter.

§ 119.730 Nonferrous metallic piping materials.

(a) Nonferrous metallic piping materials are acceptable for use in the following:

(1) Non-vital systems;

(2) Aluminum fuel piping on an aluminum hulled vessel, if at least Schedule 80;

(3) Aluminum bilge, ballast, and firemain piping on an aluminum hulled vessel;

(4) If acceptable to the cognizant OCMI, nonferrous metallic piping with a melting temperature above 927 °C (1,700 °F) may be used in vital systems that are deemed to be galvanically compatible; and

(5) Other uses specifically accepted by the cognizant OCMI.

(b) Where nonferrous metallic material is permitted for use in piping systems by this subpart, the restrictions in this paragraph apply:

(1) Provisions must be made to protect piping systems using aluminum alloys in high risk fire areas due to the low melting point of aluminum alloys;

(2) Provisions must be made to prevent or mitigate the effect of galvanic corrosion due to the relative solution potentials of copper, aluminum, and alloys of copper and aluminum, which are used in conjunction with each other, steel, or other metals and their alloys;

(3) A suitable thread compound must be used in making up threaded joints in aluminum pipe to prevent seizing. Pipe in the annealed temper must not be threaded;

(4) The use of aluminum alloys with a copper content exceeding 0.6 percent is prohibited; and

(5) The use of cast aluminum alloys in hydraulic fluid power systems must be in accordance with the requirements of §58.30–15(f) in subchapter F of this chapter.

PART 120—ELECTRICAL INSTALLATION

Subpart A—General Provisions

Sec.

120.100 Intent.