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(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.