

(b) The safety relief valve discs must be lifted from their seats in the presence of a marine inspector by either liquid, gas, or vapor pressure at least once every 5 years to determine the accuracy of adjustment and, if necessary, must be reset.

[CGFR 66-33, 31 FR 15269, Dec. 6, 1966, as amended by CGD 95-027, 61 FR 26000, May 23, 1996]

PART 39—VAPOR CONTROL SYSTEMS

Subpart 39.10—General

Sec.

- 39.10-1 Applicability—TB/ALL.
- 39.10-3 Definitions—TB/ALL.
- 39.10-5 Incorporation by reference—TB/ALL.
- 39.10-9 Vessel vapor processing unit—TB/ALL.
- 39.10-11 Personnel training—TB/ALL.
- 39.10-13 Submission of vapor control system designs—TB/ALL.

Subpart 39.20—Design and Equipment

- 39.20-1 Vapor collection system—TB/ALL.
- 39.20-3 Cargo gauging system—TB/ALL.
- 39.20-7 Tankship liquid overfill protection—T/ALL.
- 39.20-9 Tank barge liquid overfill protection—B/ALL.
- 39.20-11 Vapor overpressure and vacuum protection—TB/ALL.
- 39.20-13 High and low vapor pressure protection for tankships—T/ALL.

Subpart 39.30—Operations

- 39.30-1 Operational requirements—TB/ALL.

Subpart 39.40—Lightering and Topping-Off Operations with Vapor Balancing

- 39.40-1 General requirements for vapor balancing—TB/ALL.
- 39.40-3 Design and equipment for vapor balancing—TB/ALL.
- 39.40-5 Operational requirements for vapor balancing—TB/ALL.

AUTHORITY: 33 U.S.C. 1231; 46 U.S.C. 3306, 3703, 3715(b); 45 FR 58801, 3 CFR, 1980 Comp., p. 277; 49 CFR 1.46.

SOURCE: CGD 88-102, 55 FR 25446, June 21, 1990, unless otherwise noted.

Subpart 39.10—General

§ 39.10-1 Applicability—TB/ALL.

(a) Except as specified by paragraph (c) of this section, this part applies to each tank vessel operating in the navigable waters of the United States, when collecting vapors of crude oil, gasoline blends, or benzene emitted from a vessel's cargo tanks through a vapor control system.

(b) A tank vessel which transfers vapors of flammable or combustible cargoes other than crude oil, gasoline blends, or benzene, to a facility covered by 33 CFR part 154 must meet the requirements prescribed by the Commandant (G-MSO).

(c) A tank vessel with an existing vapor collection system specifically approved by the Coast Guard for the collection of cargo vapor which was operating prior to July 23, 1990, is subject only to § 39.30-1 and § 39.40-5 of this part as long as it transfers cargo vapor only to the specific facilities for which it was approved.

(d) This part does not apply to the collection of vapors of liquefied flammable gases as defined in § 30.10-39 of this subchapter.

[CGD 88-102, 55 FR 25446, June 21, 1990, as amended by CGD 95-072, 60 FR 50462, Sept. 29, 1995; CGD 96-041, 61 FR 50727, Sept. 27, 1996]

§ 39.10-3 Definitions—TB/ALL.

As used in this part:

Cargo deck area means that part of the weather deck that is directly over the cargo tanks.

Existing vapor collection system means a vapor collection system which was operating prior to July 23, 1990.

Facility vapor connection means the point in a facility's fixed vapor collection system where it connects with the vapor collection hose or the base of the vapor collection arm.

Independent as applied to two systems means that one system will operate with a failure of any part of the other system except power sources and electrical feeder panels.

Inerted means the oxygen content of the vapor space in a cargo tank is reduced to 8 percent by volume or less in accordance with the inert gas requirements of § 32.53 or § 153.500 of this chapter.

Coast Guard, DOT

§ 39.10-5

Lightering or lightering operation means the transfer of a bulk liquid cargo from a tank vessel to a service vessel.

Marine Safety Center means the Commanding Officer, U.S. Coast Guard Marine Safety Center, 400 Seventh Street, SW., Washington, DC 20590-0001.

Maximum allowable transfer rate means the maximum volumetric rate at which a vessel may receive cargo or ballast.

New vapor collection system means a vapor collection system which is not an existing vapor collection system.

Service vessel means a vessel which transports bulk liquid cargo between a facility and another vessel.

Topping-off operation means the transfer of a bulk liquid cargo from a service vessel to another vessel in order to load the receiving vessel to a deeper draft.

Vapor balancing means the transfer of vapor displaced by incoming cargo from the tank of a vessel receiving cargo into a tank of the vessel or facility delivering cargo via a vapor collection system.

Vapor collection system means an arrangement of piping and hoses used to collect vapor emitted from a vessel's cargo tanks and to transport the vapor to a vapor processing unit.

Vapor control system means an arrangement of piping and equipment used to control vapor emissions collected from a vessel. It includes the vapor collection system and vapor processing unit.

Vapor processing unit means the components of a vapor control system that recovers, destroys, or disperses vapor collected from a vessel.

Vessel vapor connection means the point in a vessel's fixed vapor collection system where it connects with the vapor collection hose or arm.

§ 39.10-5 Incorporation by reference—TB/ALL.

(a) Certain materials are incorporated by reference into this part with the approval of the Director of the FEDERAL REGISTER in accordance with 5 U.S.C. 552(a). To enforce any edition other than the one listed in paragraph (b) of this section, notice of change must be published in the FEDERAL REG-

ISTER and the material made available to the public. All approved material is on file at the Office of the Federal Register, 800 North Capitol Street, NW., suite 700, Washington, DC and at the U.S. Coast Guard, Office of Operating and Environmental Standards (G-MSO), 2100 Second Street, SW., Washington, DC 20593-0001, and is available from the sources indicated in paragraph (b) of this section.

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

<i>American Petroleum Institute (API)</i> , 1220 L Street NW., Washington, DC 20005	
API Standard 2000, Venting Atmospheric and Low-Pressure Storage Tanks (Non-refrigerated and Refrigerated), Third Edition, January 1982 (reaffirmed December 1987)	39.20-11
<i>American National Standards Institute (ANSI)</i> , 11 West 42nd Street, New York, NY 10036	
ANSI B16.5, Steel Pipe Flanges and Flanged Fittings, 1981 ...	39.20-1
<i>American Society for Testing and Materials (ASTM)</i> , 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959	
ASTM F1271—Standard Specification for Spill Valves for Use in Marine Tank Liquid Overpressure Protection Applications, December 29, 1989	39.20-9
<i>International Electrotechnical Commission (IEC)</i> , Bureau Central de la Commission Electrotechnique Internationale, 1 rue de Varembe', Geneva, Switzerland	
IEC 309-1—Plugs, Socket-Outlets and Couplers for Industrial Purposes: Part 1, General Requirements, 1979	39.20-9
IEC 309-2—Plugs, Socket-Outlets and Couplers for Industrial Purposes: Part 2, Dimensional Interchangeability Requirements for Pin and Contact-tube Accessories, 1981	39.20-9
<i>National Electrical Manufacturers Association (NEMA)</i> , 2101 L St. NW., Washington, DC 20036	
ANSI/NEMA WD6—Wiring Devices, Dimensional Requirements, 1988	39.20-9

§ 39.10-9

National Fire Protection Association (NFPA), 1 Batterymarch Park, Quincy, MA 02269
 NFPA 70—National Electrical Code, 1987 39.20-9

Oil Companies International Marine Forum (OCIMF), 15th Floor, 96 Victoria Street, London SW1E 5JW, England
 International Safety Guide for Oil Tankers and Terminals, Third Edition, 1988 39.30-1

[CGD 88-102, 55 FR 25446, June 21, 1990, as amended by CGD 95-072, 60 FR 50462, Sept. 29, 1995; CGD 96-041, 61 FR 50727, Sept. 27, 1996; CGD 97-057, 62 FR 51043, Sept. 30, 1997]

§ 39.10-9 Vessel vapor processing unit—TB/ALL.

Each vessel which has a vapor processing unit located on board must meet the requirements of 33 CFR part 154, subpart E to the satisfaction of the Commandant (G-MSO) in addition to complying with the requirements of this part.

[CGD 88-102, 55 FR 25446, June 21, 1990, as amended by CGD 95-072, 60 FR 50462, Sept. 29, 1995; CGD 96-041, 61 FR 50727, Sept. 27, 1996]

§ 39.10-11 Personnel training—TB/ALL.

(a) A person in charge of a transfer operation utilizing a vapor collection system must have completed a training program covering the particular system installed on the vessel. Training must include drills or demonstrations using the installed vapor control system covering normal operations and emergency procedures.

(b) The training program required by paragraph (a) of this section must cover the following subjects:

- (1) Purpose of a vapor control system;
- (2) Principles of the vapor control system;
- (3) Components of the vapor control system;
- (4) Hazards associated with the vapor control system;
- (5) Coast Guard regulations in this part;
- (6) Operating procedures, including:
 - (i) Testing and inspection requirements,
 - (ii) Pre-transfer procedures,
 - (iii) Connection sequence,
 - (iv) Start-up procedures, and

- (v) Normal operations; and
- (7) Emergency procedures.

[CGD 88-102, 55 FR 25446, June 21, 1990; 55 FR 39270, Sept. 26, 1990]

§ 39.10-13 Submission of vapor control system designs—TB/ALL.

(a) Plans, calculations, and specifications for a new vessel vapor collection system must be submitted to the Marine Safety Center for approval prior to installation.

(b) An existing vapor collection system installation that has been Coast Guard approved to transfer cargo vapor to specific facilities must be reviewed and approved by the Marine Safety Center prior to transferring vapors to other facilities.

(c) The owners/operators of a foreign flag vessel may submit certification by the classification society which classes the vessel that the vessel meets the requirements of this part as an alternative to meeting the requirements in paragraphs (a) and (b) of this section.

(d) Upon satisfactory completion of plan review and inspection of the vapor collection system or receipt of the certification provided for in paragraph (d) of this section, the Officer in Charge, Marine Inspection, shall endorse the Certificate of Inspection for U.S. flag vessels, or the Certificate of Compliance for foreign flag vessels, that the vessel is acceptable for collecting the vapor from crude oil, gasoline blends, and benzene, or any other vapor it is found acceptable to collect.

[CGD 88-102, 55 FR 25446, June 21, 1990, as amended by CGD 95-028, 62 FR 51200, Sept. 30, 1997]

Subpart 39.20—Design and Equipment

§ 39.20-1 Vapor collection system—TB/ALL.

(a) Each vapor collection system must meet the following requirements:

- (1) Except as allowed by paragraph (a)(3) of this section or the Commandant (G-MSO), vapor collection piping must be permanently installed, with the vessel's vapor connection located as close as practical to the loading manifold;

(2) If the vessel collects vapors from incompatible cargoes simultaneously, it must keep the incompatible vapors separate throughout the entire vapor collection system;

(3) A vessel certified to carry cargo listed in Table 151.05 of part 151 or Table 1 of part 153 of this chapter may have vapor connections located in the vicinity of each tank in order to preserve segregation of cargo systems, in lieu of common header piping;

(4) A means must be provided to eliminate liquid condensate which may collect in the system, such as draining and collecting liquid from each low point in the line;

(5) Vapor collection piping must be electrically bonded to the hull and must be electrically continuous; and

(6) An inerted tankship must have a means to isolate the inert gas supply from the vapor collection system. The inert gas main isolation valve required by SOLAS 74, as amended, chapter II-2, Regulation 62.10.8 may be used to satisfy this requirement.

(b) The vapor collection system must not interfere with the proper operation of the cargo tank venting system.

(c) An isolation valve capable of manual operation must be provided at the vessel vapor connection. The valve must have an indicator to show clearly whether the valve is in the open or closed position, unless the valve position can be readily determined from the valve handle or valve stem.

(d) The last 1.0 meter (3.3 feet) of vapor piping before the vessel vapor connection must be:

(1) Painted red/yellow/red with:

(i) The red bands 0.1 meter (0.33 feet) wide, and

(ii) The middle yellow band 0.8 meter (2.64 feet) wide; and

(2) Labeled "VAPOR" in black letters at least 50 millimeters (2 inches) high.

(e) Each vessel vapor connection flange must have a permanently attached 0.5 inch diameter stud at least 1.0 inch long projecting outward from the flange face. The stud must be located at the top of the flange, midway between bolt holes, and in line with the bolt hole pattern.

(f) Each hose used for transferring vapors must:

(1) Have a design burst pressure of at least 25 psig;

(2) Have a maximum allowable working pressure of at least 5 psig;

(3) Be capable of withstanding at least 2.0 psi vacuum without collapsing or constricting;

(4) Be electrically continuous with a maximum resistance of ten thousand (10,000) ohms;

(5) Have flanges with:

(i) A bolt hole arrangement complying with the requirements for 150 pound class ANSI B16.5 flanges, and

(ii) One or more 0.625 inch diameter holes in the flange located midway between bolt holes and in line with the bolt hole pattern;

(6) Be abrasion resistant and resistant to kinking; and

(7) Have the last 1.0 meter (3.3 feet) of each end of the vapor hose marked in accordance with paragraph (d) of this section.

(g) Vapor hose handling equipment must be provided with hose saddles which provide adequate support to prevent kinking or collapse of hoses.

[CGD 88-102, 55 FR 25446, June 21, 1990, as amended by CGD 95-072, 60 FR 50462, Sept. 29, 1995; CGD 96-041, 61 FR 50727, Sept. 27, 1996]

§ 39.20-3 Cargo gauging system—TB/ALL.

(a) Each cargo tank of a tank vessel that is connected to a vapor collection system must be equipped with a cargo gauging device which:

(1) Provides a closed gauging arrangement as defined in §151.15.10 of this chapter that does not require opening the tank to the atmosphere during cargo transfer;

(2) Allows the operator to determine the liquid level in the tank for the full range of liquid levels in the tank;

(3) Indicates the liquid level in the tank at the location where cargo transfer is controlled; and

(4) If portable, is installed on the tank during the entire transfer operation.

(b) Except when a tank barge complies with §39.20-9(a) of this part, each cargo tank of a barge must have a high level indicating device that:

(1) Provides a visual indication of the liquid level in the cargo tank when the

§ 39.20-7

cargo level is within 1.0 meter (3.28 feet) of the tank top;

(2) Has the maximum liquid level permitted under § 39.30-1(e) of this part at even keel conditions conspicuously and permanently marked on the indicating device; and

(3) Is visible from all cargo control areas on the tank barge.

§ 39.20-7 Tankship liquid overflow protection—T/ALL.

(a) Each cargo tank of a tankship must be equipped with an intrinsically safe high level alarm and a tank overflow alarm.

(b) The high level alarm and tank overflow alarm required by paragraph (a) of this section, if installed after July 23, 1990 must:

(1) Be independent of each other;

(2) Alarm in the event of loss of power to the alarm system or failure of electrical circuitry to the tank level sensor; and

(3) Be able to be checked at the tank for proper operation prior to each transfer or contain an electronic self-testing feature which monitors the condition of the alarm circuitry and sensor.

(c) The high level alarm required by paragraph (a) of this section must:

(1) Alarm before the tank overflow alarm, but no lower than 95 percent of tank capacity;

(2) Be identified with the legend "High Level Alarm" in black letters at least 50 millimeters (2 inches) high on a white background; and

(3) Have audible and visible alarm indications that can be seen and heard on the vessel where cargo transfer is controlled.

(d) The tank overflow alarm required by paragraph (a) of this section must:

(1) Be independent of the cargo gauging system;

(2) Have audible and visible alarm indications that can be seen and heard on the vessel where cargo transfer is controlled and in the cargo deck area;

(3) Be identified with the legend "TANK OVERFILL ALARM" in black letters at least 50 millimeters (2 inches) high on a white background; and

(4) Alarm early enough to allow the person in charge of transfer operations

46 CFR Ch. I (10-1-99 Edition)

to stop the transfer operation before the cargo tank overflows.

(e) If a spill valve is installed on a cargo tank fitted with a vapor collection system, it must meet the requirements of § 39.20-9(c) of this part.

(f) If a rupture disk is installed on a cargo tank fitted with a vapor collection system, it must meet the requirements of § 39.20-9(d) of this part.

§ 39.20-9 Tank barge liquid overflow protection—B/ALL.

Each cargo tank of a tank barge must have one of the following liquid overflow protection arrangements.

(a) A system meeting the requirements of § 39.20-7 of this part which:

(1) Includes a self-contained power supply;

(2) Is powered by generators installed on the barge; or

(3) Receives power from a facility and is fitted with a shore tie cable and a 120 volt 20 amp explosion-proof plug which meets:

(i) ANSI/NEMA WD6;

(ii) NFPA 70, Articles 410-57 and 501-12; and

(iii) § 111.105-9 of this chapter.

(b) An intrinsically safe overflow control system which:

(1) Is independent of the cargo gauging device required by § 39.20-3(a) of this part;

(2) Actuates an alarm and automatic shutdown system at the facility overflow control panel, or on the vessel to be lightered if a lightering operation, 60 seconds before the tank becomes 100 percent liquid full;

(3) Is able to be checked at the tank for proper operation prior to each loading;

(4) Consists of components which, individually or in series, will not generate or store a total of more than 1.2 V, 0.1 A, 25 mW, or 20 microjoules;

(5) Has at least one tank overflow sensor switch with normally closed contacts per cargo tank;

(6) Has all tank overflow sensor switches connected in series;

(7) Has interconnecting cabling that meets § 111.105-15(b) of this chapter; and

(8) Has a male plug with a 5 wire, 16 amp connector body meeting IEC 309-1/309-2 which is:

(i) Configured with pins S2 and R1 for the tank overflow sensor circuit, pin G connected to the cabling shield, and pins N and T3 reserved for an optional high level alarm circuit meeting the requirements of this paragraph; and

(ii) Labeled "Connector for Barge Overflow Control System" and with the total inductance and capacitance of the connected switches and cabling.

(c) A spill valve which:

(1) Meets ASTM F1271;

(2) Relieves at a pressure higher than the pressure at which the pressure relief valves meeting the requirements of § 39.20-11 operate;

(3) Limits the maximum pressure at the cargo tank top during liquid overflow, at the maximum loading rate for the tank, to not more than the maximum design working pressure for the tank; and

(4) If the vessel is in ocean or coastwise service, has provisions to prevent opening due to cargo sloshing.

(d) A rupture disk arrangement which meets paragraphs (c)(2), (c)(3) and (c)(4) of this section and is approved by the Commandant (G-MSO).

[CGD 88-102, 55 FR 25446, June 21, 1990, as amended by CGD 95-072, 60 FR 50462, Sept. 29, 1995; CGD 96-041, 61 FR 50727, Sept. 27, 1996]

§ 39.20-11 Vapor overpressure and vacuum protection—TB/ALL.

(a) The cargo tank venting system required by § 32.55 of this chapter must:

(1) Be capable of discharging cargo vapor at 1.25 times the maximum transfer rate such that the pressure in the vapor space of each tank connected to the vapor collection system does not exceed:

(i) The maximum design working pressure for the tank, or

(ii) If a spill valve or rupture disk is fitted, the pressure at which the device operates;

(2) Not relieve at a pressure corresponding to a pressure in the cargo tank vapor space of less than 1.0 psig;

(3) Prevent a vacuum in the cargo tank vapor space, whether generated by withdrawal of cargo or vapor at maximum rates, that exceeds the maximum design vacuum for any tank connected to the vapor collection system; and

(4) Not relieve at a vacuum corresponding to a vacuum in the cargo tank vapor space of less than 0.5 psi below atmospheric pressure.

(b) Each pressure-vacuum relief valve must:

(1) Be tested for venting capacity in accordance with paragraph 1.5.1.3 of API 2000; and

(2) Have a means to check that the device operates freely and does not remain in the open position, if installed after July 23, 1991.

(c) The relieving capacity test required by paragraph (b)(1) of this section must be carried out with a flame screen fitted at the vacuum relief opening and at the discharge opening if the pressure-vacuum relief valve is not designed to ensure a minimum vapor discharge velocity of 30 meters (98.4 ft.) per second.

§ 39.20-13 High and low vapor pressure protection for tankships—T/ALL.

Each tankship vapor collection system must be fitted with a pressure sensing device that senses the pressure in the main vapor collection line, which:

(a) Has a pressure indicator located on the vessel where the cargo transfer is controlled; and

(b) Has a high pressure and a low pressure alarm that:

(1) Is audible and visible on the vessel where cargo transfer is controlled;

(2) Alarms at a high pressure of not more than 90 percent of the lowest pressure relief valve setting in the cargo tank venting system; and

(3) Alarms at a low pressure of not less than four inches water gauge (0.144 psig) for an inerted tankship, or the lowest vacuum relief valve setting in the cargo tank venting system for a non-inerted tankship.

Subpart 39.30—Operations

§ 39.30-1 Operational requirements—TB/ALL.

(a) Vapor from a tank vessel may not be transferred to:

(1) A facility in the United States which does not have its letter of adequacy endorsed as meeting the requirements of 33 CFR part 154, subpart E; or

(2) In the case of a lightering or topping off operation, a vessel which does not have its certificate of inspection or certificate of compliance endorsed as meeting the requirements of this part.

(b) The pressure drop through the vapor collection system from the most remote cargo tank to the vessel vapor connection must be:

(1) Determined for each cargo handled by the vapor collection system at the maximum transfer rate and at lesser transfer rates;

(2) Based on a 50 percent cargo vapor and air mixture, and a vapor growth rate appropriate for the cargo being loaded; and

(3) Included in the vessel's oil transfer procedures as a table or graph showing the liquid transfer rate versus the pressure drop.

(c) If a vessel carries vapor hoses, the pressure drop through the hoses must be included in the pressure drop calculations required by paragraph (b) of this section.

(d) The rate of cargo transfer must not exceed the maximum allowable transfer rate as determined by the lesser of the following:

(1) Eighty (80) percent of the total venting capacity of the pressure relief valves in the cargo tank venting system when relieving at the set pressure required by § 39.20-11(a) of this part;

(2) The total vacuum relieving capacity of the vacuum relief valves in the cargo tank venting system when relieving at the set pressure required by § 39.20-11(a) of this part;

(3) The rate based on pressure drop calculations at which, for a given pressure at the facility vapor connection, or if lightering at the vapor connection of the vessel receiving cargo, the pressure in any cargo tank connected to the vapor collection system exceeds 80 percent of the setting of any pressure relief valve in the cargo tank venting system.

(e) A cargo tank must not be filled higher than:

(1) 98.5 percent of the cargo tank volume; or

(2) The level at which an overfill alarm complying with § 39.20-7 or § 39.20-9(b)(2) of this part is set.

(f) A cargo tank must not be opened to the atmosphere during cargo trans-

fer operations except as provided in paragraph (g) of this section.

(g) A cargo tank may be opened to the atmosphere for gauging or sampling while a tank vessel is connected to a vapor control system if the following conditions are met:

(1) The cargo tank is not being filled;

(2) Except when the tank is inerted, any pressure in the cargo tank vapor space is first reduced to atmospheric pressure by the vapor control system;

(3) The cargo is not required to be closed or restricted gauged by Table 151.05 of part 151 or Table 1 in part 153 of this chapter; and

(4) For static accumulating cargo, all metallic equipment used in sampling or gauging is electrically bonded to the vessel before it is put into the tank, remains bonded to the vessel until it is removed from the tank, and if the tank is not inerted, a period of 30 minutes has elapsed since loading of the tank was completed.

(h) For static accumulating cargo the initial transfer rate must be controlled in accordance with Section 7.4 of the OCIMF, International Safety Guide for Oil Tankers and Terminals, in order to minimize the development of a static electrical charge.

(i) If cargo vapor is collected by a facility that requires the vapor from the vessel to be inerted in accordance with 33 CFR 154.820(a) or (b), the oxygen content in the vapor space of each cargo tank connected to the vapor collection system must not exceed 8 percent by volume at the start of cargo transfer. The oxygen content of each tank must be measured at a point one meter (3.28 feet) below the tanktop and at a point equal to one-half of the ullage. Where tanks have partial bulkheads, the oxygen content of each area of that tank formed by each partial bulkhead must be measured at a point one meter (3.28 feet) below the tanktop and at a point equal to one-half of the ullage.

(j) If the vessel is equipped with an inert gas system, the isolation valve required by § 39.20-1(a)(6) of this part must remain closed during vapor transfer.

(k) Unless equipped with an automatic self-test and circuit monitoring feature, each high level alarm and tank overfill alarm required by § 39.20-7 or

§ 39.20-9 of this part, on a cargo tank being loaded, must be tested at the tank for proper operation within 24 hours prior to the start of cargo transfer.

[CGD 88-102, 55 FR 25446, June 21, 1990; 55 FR 39270, Sept. 26, 1990]

Subpart 39.40—Lightering and Topping-Off Operations with Vapor Balancing

§ 39.40-1 General requirements for vapor balancing—TB/ALL.

(a) Except as provided in paragraph (b) of this section, each vessel which uses vapor balancing while conducting a lightering or topping-off operation must meet the requirements of this subpart in addition to the requirements of subparts 39.10, 39.20, and 39.30 of this part.

(b) An arrangement to control vapor emissions during a lightering or topping-off operation which does not use vapor balancing must receive approval from the Commandant (G-MSO).

(c) A vapor balancing operation must not use a compressor or blower to assist vapor transfer without approval from the Commandant (G-MSO).

(d) Vapor balancing is prohibited when the cargo tanks on a vessel discharging cargo are inerted and the cargo tanks on a vessel receiving cargo are not inerted.

(e) A vessel which intends to engage in a lightering or topping-off operation while collecting cargo vapor from other than crude oil, gasoline, or benzene must receive specific approval from the Commandant (G-MSO).

[CGD 88-102, 55 FR 25446, June 21, 1990; 55 FR 39270, Sept. 26, 1990, as amended by CGD 95-072, 60 FR 50462, Sept. 29, 1995; CGD 96-041, 61 FR 50727, Sept. 27, 1996]

§ 39.40-3 Design and equipment for vapor balancing—TB/ALL.

(a) If the cargo tanks on a vessel discharging cargo and a vessel receiving cargo are inerted, the service vessel must:

(1) Have a means to inert the vapor transfer hose prior to transferring cargo vapor; and

(2) Have an oxygen analyzer with a sensor or sampling connection fitted

within 3 meters (9.74 ft.) of the vessel vapor connection which:

(i) Activates an audible and visible alarm at a location on the service vessel where cargo transfer is controlled when the oxygen content in the vapor collection system exceeds 8 percent by volume;

(ii) Has an oxygen concentration indicator located on the service vessel where the cargo transfer is controlled; and

(iii) Has a connection for injecting a span gas of known concentration for calibration and testing of the oxygen analyzer.

(b) If the cargo tanks on a vessel discharging cargo are not inerted, the vapor collection line on the service vessel must be fitted with a detonation arrester that meets the requirements of 33 CFR 154.822(a) located within 3 meters (9.74 ft.) of the vessel vapor connection.

(c) An electrical insulating flange or one length of non-conductive hose must be provided between the vessel vapor connection on the service vessel and the vapor connection on the vessel being lightered or topped-off.

§ 39.40-5 Operational requirements for vapor balancing—TB/ALL.

(a) During a lightering or topping-off operation each cargo tank being loaded must be connected by the vapor collection system to a cargo tank which is being discharged.

(b) If the cargo tanks on both the vessel discharging cargo and the vessel receiving cargo are inerted, the following requirements must be met:

(1) Each tank on a vessel receiving cargo which is connected to the vapor collection system must be tested prior to cargo transfer to ensure that the oxygen content in the vapor space does not exceed 8 percent by volume. The oxygen content of each tank must be measured at a point one meter (3.28 feet) below the tanktop and at a point equal to one-half of the ullage. Where tanks have partial bulkheads, the oxygen content of each area of that tank formed by each partial bulkhead must be measured at a point one meter (3.28 feet) below the tanktop and at a point equal to one-half of the ullage;

§ 39.40-5

46 CFR Ch. I (10-1-99 Edition)

(2) The oxygen analyzer required by § 39.40-3(a) must be tested for proper operation prior to the start of each transfer operation;

(3) The oxygen content of vapors being transferred must be continuously monitored during the transfer operation;

(4) Cargo transfer must be terminated if the oxygen content exceeds 8 percent by volume and must not be restarted until the oxygen content in the tanks of the vessel receiving cargo is reduced to 8 percent by volume or less; and

(5) The vapor transfer hose must be purged of air and inerted prior to starting vapor transfer.

(c) The isolation valve, required by § 39.20-1(c) of this part, located on the service vessel must not be opened until the pressure in the vapor collection system on the vessel receiving cargo exceeds the pressure in the vapor col-

lection system on the vessel discharging cargo.

(d) The cargo transfer rate must be controlled from the vessel discharging cargo, and must not exceed the maximum allowable transfer rate for the vessel receiving cargo.

(e) The pressure in the vapor space of any cargo tank connected to the vapor collection line on either the vessel receiving cargo or the vessel discharging cargo must not exceed 80 percent of the lowest setting of any pressure relief valve during ballasting or cargo transfer.

(f) All impressed current cathodic protection systems must be deenergized during cargo transfer operations.

(g) Tank washing is prohibited unless the cargo tanks on both the vessel discharging cargo and the vessel receiving cargo are inerted or the tank is isolated from the vapor collection line.

[CGD 88-102, 55 FR 25446, June 21, 1990; 55 FR 39270, Sept. 26, 1990]

INDEX

SUBCHAPTER D—TANK VESSELS

EDITORIAL NOTE: This listing is provided for informational purposes only. It is compiled and kept current by the U.S. Coast Guard, Department of Transportation.

Part, subpart, or section

A

Accident or casualty report	Subpart 35.15
Accommodations for crew	Subpart 32.40
Application	32.40-1
Construction	32.40-15
Heating and cooling	32.40-50
Hospital space	32.40-35
Insect screens	32.40-55
Location of Crew spaces	32.40-10
Messrooms	32.40-30
On tankships constructed before June 15, 1987	32.40-65
On tankships of less than 100 gross tons and manned tank barges	32.40-60
Other spaces	32.40-40
Sleeping Accommodations	32.40-20
Washrooms and toilet rooms	32.40-25
Aids to Navigation:	
Charts or information regarding	35.20-1
Coast pilots	35.20-1
Current tables	35.20-1
Light lists	35.20-1
Nautical publications	35.20-1
Notice to Mariners	35.20-1
Sailing directions	35.20-1
Tide tables	35.20-1
Air compressor	32.35-15, 35.35-85
Alarm bells	32.25
Marking required	35.40-5
Switches, markings of	35.40-1
Alarm systems	Subpart 32.25
Alcohol or drugs, used by crew	35.05-25
Alterations and repairs, regulations governing	30.01-10, 31.10-25
American Bureau of Shipping	31.10-1
Annual inspection:	
Application for:	31.01-15
Fire extinguishers	31.10-18
Anode installations, sacrificial	35.01-25
Appeal right of	30.20-50
Application for inspection	31.01-15, 31.1-20
Application, electrical installations Subpart	32.45
Application of regulations:	
Governing alterations and repairs	30.01-10
Vessels on an international voyage	30.01-6
Approved, definition	30.10-3

46 CFR Ch. I (10-1-99 Edition)

Arresters, flame..... 30.10-23, 32.20-10
Assignment of functions..... 31.01-10
Auto pilot 35.20-45
Auxiliary machinery:
 Construction 32.35-1
 Design 32.35-1
 Installation of internal combustion engine 32.35-5
Axes, fire 34.05-20, 34.60

B

Ballasting 31.10-32
Bell, alarm Subpart 32.25
Bell signals..... 32.30-5
Bilge injection valves 31.10-20
Bilge systems Subpart 32.52
Bills of lading required 35.01-10
Boilerroom, fire extinguishing systems for 34.05-5
Boilers:
 Accident report by chief engineer 35.25-5
 Examination by engineer 35.25-1
 Safety rules for fires 35.30-5
Breches buoy, poster containing instruction regarding use of..... Subpart 35.12
Breathing apparatus, fresh air 35.30-20, 35.40-20
Butterworth plates, safety rules regarding 35.30-10

C

Carbon dioxide extinguishing systems:
 Alarms 34.15-30
 Amount of carbon dioxide required 34.15-5
 Application 34.15-1
 Controls 34.15-10
 Discharge outlets..... 34.15-25
 Dry cargo spaces 34.15-5
 Enclosed ventilation systems for rotating electrical propulsion equip-
 ment 34.15-5
 Enclosure openings 34.15-35
 Installation contracted for prior to January 1, 1962 34.15-90
 Machinery spaces pumprooms paint lockers and similar spaces 34.15-5
 Piping 34.15-15
 Pressure relief 34.15-40
 Quantity, pipe sizes, and discharge rates 34.15-5
 Storage 34.15-20
 Total available supply 34.15-5
Cargo definition 30.10-5
Cargo discharge 32.5-3
Cargoes elevated temperatures..... Part 36
Cargoes regulated..... Subpart 30.25
Cargo gear certificates or registers 31.10-16, Subpart 31.37
Cargo gear inspection 31.10-16, 31.37
Cargo handling:
 Equipment maintenance..... 35.35-70
 General 35.35
 Liquefied petroleum gases Subpart 38.15
 Loading information..... 35.35
 Safety requirements 35.30
 Unmanned tank barges 35.35-1
Cargo handling room, definitions..... 30.10-6

Subchapter D Index

Cargo hose	35.35-15, 35.35-70, 38.15-5
Cargo piping.....	40.15-1,38.10-10
Cargo pumps.....	Subpart 32.50
Cargo pump relief valves.....	36.10-1
Cargo pump, testing of	35.35-70
Cargo tank hatches, ullage holes and Butterworth plates, safety rules re- garding	35.30-10
Cargo tanks:	
Construction and testing of	32.60-40, 32.65-40, 32.70-25, 32.75-10
Design and installation of.....	38.05
Electric bonding and grounding of	32.75-15
Filling densities	38.15-1
Fire extinguishing systems for	34.05-5
Hydrostatic test of.....	38.25-1
Installation for carrying liquids at elevated temperatures	36.05-1
Independent.....	32.60-30, 32.65-30, 32.70-25, 32.75-10
Lagging.....	38.05-20
Liquefied petroleum gases	Part 38
Liquid level gauging devices	38.10-20, 32.20-20
Marking of	38.05-5
Periodic test.....	38.25-1
Piping	38.10-10
Refrigeration system used with.....	38.05-25
Removal from service	38.25-5
Venting of.....	Subpart 32.55, 38.20-1, 38.20-5
Cargo transfer:	
Approval of	35.35-25
Conditions affecting	35.35-40
Connecting of cargo hose.....	35.35-15
Declaration of inspection	35.35-30
Duties of senior deck officer.....	35.35-35
Electric bonding.....	35.35-5
Filling densities.....	38.15-1
Handling of packaged goods, etc.....	35.35-55
Inspection prior to.....	35.35-2 0
Liquefied flammable gases	38.15-5
Maintenance of equipment	35.35-70
Men on duty	35.35-1
Tank barges	35.35-60
Termination of	35.35-50
Towing vessels furnishing steam, air or electricity	35.35-45
Vapor control systems.....	Part 39
Vessels coming alongside during	35.35-42
Carriage of person other than crew	35.01-15
Casualty or accident report	Subpart 35.15
Certificate of class	31.10-5
Certificate of inspection:	
Application for	31.01-15, 31.01-20
Cargoes of elevated temperatures, carriage of.....	36.01-5
Delivery of	31.05-1
Endorsed for liquefied flammable gas	38.01-5
Indication of water traveled on.....	31.20-1
Ocean or unlimited coastwise vessels on inland and Great Lakes Routes-TB/OC.....	30.01-7
Posting of.....	31.05-5
Terms, endorsements.....	31.05-15
Certificates regarding shipboard cargo gear.....	31.10-16, 31.37

46 CFR Ch. I (10–1–99 Edition)

Certificates under International Convention for Safety of Life at Sea.....	31.10-16, 31.37
1960 American Bureau of Shipping.....	31.40-45
Application	31.40-1
Cargo Ship Safety Construction Certificate.....	31.40-5
Cargo Ship Safety Equipment Certificate.....	31.40-10
Cargo Ship Safety Radiotelegraphy Certificate.....	31.40-15
Cargo Ship Safety Radiotelephony Certificate.....	31.40-20
Duration of Convention Certificate.....	31.40-40
Exemption Certificate	31.40-25
Posting of Convention Certificates.....	31.40-35
Certified crewmembers	31.15-1
Certified definition	30.10-7
Charts of navigable waters required	35.20-1
Chief Engineer:	
Repairs of boilers and unfired pressure vessels and reports or accidents.....	35.25-5
Class, certificate of.....	31.10-5
Classification requirements, definition	30.10-9
CO ₂ fire apparatus, marking required.....	35.40-10
Coast Guard District Commander	30.10-19
Coast pilots	35.20-1
Coastwise, definition	30.10-11
Cofferdam:	
Definition of	30.10-13
Location of.....	32.60-10, 32.65-15, 32.70-10
Requirements of	32.70-10
Venting of.....	32.55-45
Combustible gas indicator.....	35.30-15
Combustible liquids, definition	30.10-15
Commandant, definition.....	30.10-17
Commodities regulated.....	Subpart 30.25
Communication, interior system	Subpart 32.30
Construction and testing of cargo tanks and bulkheads on tank vessels	32.65-40, 32.60-40, 32.75-10
Construction of tank barges of materials other than steel or iron, requirements	32.80-1
Construction of tank vessels:	
Cargo spaces segregated from cargo tanks	32.57-10, 32.60
Ceilings	32.57-1
Deck	32.57-10
Enclosed spaces	32.60-10
General cargo spaces	32.60-15
Hatch covers.....	32.57-10
Hull requirements.....	32.60, 32.65, 32.70, 32.75
Lamp Lockers.....	32.57-10
Living quarters.....	32.60-25, 32.65-25
Location of cargo tank spaces.....	32.60-10
Location of independent	tanks32.60-30
Machinery	32.35-1
Paint lockers	32.57-10
Requirements for scantlings, material and workmanship	32.60-1, 32.65-1, 32.70-5, 32.75-5
Segregation of cargo.....	32.60-10
Stowage spaces	32.60-10
Subdivision of cargo space.....	32.60-5, 32.65-10
Testing of cargo tanks and bulkheads	32.60-40, 32.65-40, 32.70-25, 32.75-10

Subchapter D Index

Construction of vessels for liquefied gases.....	38.05-1
Construction of wood hull tank vessels:	
Application of regulations	32.75-1
Electric bonding and grounding of cargo tanks.....	32.75-15
Hold spaces	32.75-20
Independent cargo tanks	32.75-10
Convention certificates.....	Subpart 31.40
Conversion of vessels to tank vessels	31.10-10
Crew:	
Certified members of.....	31.15-1
Illness of	35.05-25
Licensed officers	31.15-1
Physical condition of.....	35.05-20
Required for cargo handling.....	35.35-1
Crew accommodations:	
Inspection of.....	31.10-45
Requirements for	Subpart 32.40
Sanitary condition of.....	35.01-5
Current tables	35.20-1

D

Deck foam system.....	Subpart 34.20
Declaration of inspection prior to bulk cargo transfer	35.35-30
Definition of terms	Subpart 30.10
Delivery of certificate of inspection	31.05-1
Design:	
Cargo tanks.....	38.05-2
Main and auxiliary machinery.....	32.35-1
Vapor control system.....	Subpart 39.20
Devices, spark producing.....	35.30-35
Display of Plans	35.10-3
Draft marks.....	32.05-1, 35.20-5
Drills:	
Boat.....	35.10-5
Fire	35.10-5
Line throwing appliance	35.10-1
Drydock or hauling out	31.10-20

E

Effective date of regulation.....	30.01-15
Electric bonding and grounding.....	32.75-15, 35.35-5
Electrical installations.....	31.35, 32.45
Elevated temperature cargoes:	
Cargo pump relief valves.....	36.10-1
Certificate of inspection	36.01-5
Flame Screens, vents and ventilations	36.20-1
Installation of cargo tanks	36.05-1
Lagged tanks, periodic inspections.....	36.30-1
Protection of personnel	36.05-10
Ventilation of pumproom.....	36.20-5
Emergency:	
Authority of senior officer	35.35-75
Breathing equipment, marking	35.40-20
Lighting and power systems.....	35.10-15
Outfit.....	35.30-20
Repairs to firefighting equipment	35.01-35
Signals	35.10-5

46 CFR Ch. I (10–1–99 Edition)

Training	35.10-1
Enclosed ventilating system, fire extinguishing system	34.05-5
Enforcement.....	30.20-1
Engineering, electrical	31.35, 32.45
Engineering, marine Subpart	31.30
Equipment:	
Cargo handling.....	Subpart 32.50
Emergency.....	35.30-20
Fire and emergency, marking.....	Subpart 35.40, 35.40-40
Installed but not required.....	34.01-5
Portable electrical.....	35.30-30
Previously approved	30.01-15
Equipment installations	Subpart 32.20
Equipment installations on vessels during World War II.....	32.20-1
Equipment, navigation	Subpart 32.15
Equivalents	30.15-1
Escape, means of.....	32.02-1
Examination of tail shaft	61.15-15
Examination of sea chests, sea valves, sea strainers, and bilge injection valves.....	31.10-20
Exemption certificate.....	31.40-25
Explosives, transportation of	35.30-25

F

Fire axes.....	34.05-20, 34.60
Location of	34.60-10
Number required	34.60-5
Fire drills	35.10-5
Fire extinguishers, portable and semiportable:	
Application	34.50-1
Classification.....	34.50-5
Location	34.50-10
Spare charges	34.50-15
Vessels contracted for prior to January 1, 1962	34.50-90
Fire extinguishing deck foam system:	
Application	34.20-1
Area protected	34.20-5
Cargo area definitions.....	34.20-3
Controls.....	34.20-10
Discharge outlets.....	34.20-20
Installations contracted for prior to January 1, 1970.....	34.20-90
Marking.....	35.40-10
Piping	34.20-15
Quantity of foam required	34.20-5
Rate of application.....	34.20-5
Separate supply of foam-producing material.....	34.20-5
Supply of foam producing material.....	34.20-5
Water supply	34.20-5
Fire extinguishing fixed foam systems:	
Additional protection required.....	34.17-25
Application	34.17-1
Area protected	34.17-5
Controls.....	34.17-10
Discharge outlets.....	34.17-20
Installations contracted for prior to January 1, 1962.....	34.17-90
Piping	34.17-15
Rate of Application.....	34.17-5

Subchapter D Index

Separate supply of foam-producing material.....	34.17-5
Supply of foam producing material.....	34.17-5
Water supply for required pumps.....	34.17-5
Fire extinguishing systems:	
Boilerrooms.....	34.05-5
Carbon dioxide.....	34.15
Cargo tanks.....	34.05-5
Dry cargo compartments.....	34.05-5
Enclosed ventilating systems.....	34.05-5
Foam, deck.....	Subpart 34.20
Foam, fixed.....	Subpart 34.17
Installations contracted for prior to January 1, 1962.....	34.10-90
Lamp, paint lockers and similar pages.....	34.05-5
Machinery spaces.....	34.05-5
Marking.....	35.40-10
Piping.....	34.10-15
Pumprooms.....	34.05-5
Fire extinguishing system, steam smothering:	
Application.....	34.13-1
Installations contracted for prior to January 1, 1962.....	34.17-90
Firefighting equipment:	
Application.....	34.01-1
Fire axes.....	34.05-20, 34.60
Fire main system.....	34.05-1
Hose.....	34.10-10
Nozzles.....	35.40-10
Hydrants.....	35.40-15
Installed but not required.....	34.01-5
Portable, vessel's name on.....	35.40-40
Protection for unusual arrangements or special products.....	34.01-10
Testing and inspection.....	31.10-18, 31.10-19
Fire main system:	
Application.....	34.10-1
Fire pumps.....	34.10-5
Fire station hydrants hose and nozzles.....	34.10-10
Fire, matches and smoking safety rules.....	35.30-5
Fire protection, structural, for tank vessels contracted for on or after January 1, 1963.....	Subpart 32.57
Fire protection, structural for ships with a keel laying date on or after January 1, 1975.....	Subpart 32.56
Fire station.....	34.10-10
Fitting and piping for liquefied petroleum gases.....	38.10-10
Fittings, cargo.....	Subpart 32.50
Flame arresters.....	30.10-23, 32.20-10
Flame screen.....	30.10-25, 36.20-1
Flammable liquid, definition.....	30.10-22
Flammable liquid and gas fuels as ships' stores.....	35.30-40
Flammable or inflammable, definition.....	30.10.21
Flashpoint, definition.....	30.10-27
Foam hose/monitor stations.....	35.40-17
Fresh air breathing apparatus.....	35.30-20, 35.40-20
Fuel oil, requirements.....	35.25-10
Fuels, flammable liquid and gas.....	35.30-40
Functions, assignment of.....	30.01-3

G

Galley fires, safety rules.....	35.30-5
---------------------------------	---------

46 CFR Ch. I (10–1–99 Edition)

Gangway signs	35.30-1
Gas chemist certified by American Bureau of Shipping	35.01-1
Gas free, definition	30.10-29
Gauge, liquid level	32.20-20, 38.10-20, 39.20-3
Gear, shipboard cargo, certificates or registers	31.10-16, 31.37
General alarm switch, marking of	35.40-1
General alarm systems:	
Alarm bells for tankships constructed on or after September 15, 1943.....	32.25-1
Alarm bells for tankships constructed prior to September 15, 1943	32.25
Alarm bells for manned barges	32.25
General rules and regulations	30.10-31
Grade D, combustible liquid	30.10-15
Grade E, combustible liquid	30.10-15
Great Lakes	30.10-33

H

Hauling out or drydocking	31.10-20
Headquarters	30.10-35
Hose, cargo	32.50-30
Hospital accommodations	32.40-1
Hull and cargo tank requirements:	
Alternative arrangements.....	32.63-8
Application	32.63-1
Barge hull classifications.....	32.63-5
Cargo tanks and supports	32.63-25
Hull structure.....	32.63-20
Rakes and coamings	32.63-10
Hull requirements.....	32.60, 32.63, 32.65, 32.70, 32.75, 32.80
Hydrostatic test for cargo tanks.....	38.25-1

I

Independent cargo tanks.....	32.60-30, 32.60-35, 32.65-30, 32.70-25 32.75-10
Inert gas system.....	Subpart 32.53
Inspection:	
Alternations and repairs.....	31.10-25
Bilges.....	31.10-50
Certificate of.....	Subpart 31.05
Conversion of a vessel to a tank vessel, application for	31.01-20
Crew accommodations	31.10-45
During trial trip	31.10-40
General requirements	Subpart 31.01
Initial, scope of	31.01-5
Lagged tanks.....	36.30-1
New tank vessel	31.01-20, 31.10-5
Plans and specifications.....	31.10-5
Recognized classification society	31.10-1
Required.....	31.01-1
Required before making repairs.....	35.01-1
Required, liquefied, petroleum gas tanks	38.25-1
Required on new tank vessels	31.01-1
Safety valves	38.25-10
Two years	31.10-15, 31.10-17
Inspection and certification of cargo gear.....	31.10-16
Inspection and test, periodic, of independent cargo tanks	38.25
Inspection of cargo gear:	
Additions to gear	31.37-60

Subchapter D Index

Advance notice that cargo gear testing is desired.....	31.37-80
Alterations, renewals, or repairs of cargo gear	31.37-65
Annealing	31.37-55
Cargo gear plans	31.37-15
Certification	31.10-16
Definitions of terms	31.37-3
Dismantling or disassembling.....	31.37-3
Factors of safety.....	31.37-25
Loose gear certificates and tests.....	31.37-30
Marking of booms and cranes.....	31.37-45
Proof test of cargo gear as a unit	31.37-40
Records	31.37-75
Responsibility for conducting required tests and examinations	31.37-85
Responsibility of ship's officer for inspection of cargo gear.....	31.37-70
Safe working load	31.37-3
Tests and examinations of shipboard cargo gear	31.37-5
Thorough examination.....	31.37-3
Ton.....	31.37-3
When made.....	31.37-1
Installation of cargo tanks.....	38.05-10
Installation of internal combustion engines.....	32.35-5
Installations made during the Unlimited National Emergency.....	32.20-1
Internal combustion installations, fire extinguishing systems	34.05-5
International voyage.....	30.01-6
Interior communications system:	
Bell signals between engine room and pilothouse.....	32.30-5
Inspection of	32.30
Telegraph systems	32.30
Telephone equipment	32.30-1
Voice tubes.....	32.30-1
Issuance of certificates of inspection.....	31.05-1

L

Lagging for independent cargo tanks.....	38.05-20
Lakes, bays and sounds	30.10-41
Lamp and paintrooms:	
Fire extinguishing system for.....	34.05-5
Fireproofing of.....	32.85-1
Licensed officers required	31.15-1
Lifeboat drills	35.10-5
Lifesaving Appliances and Approaches	Subpart 31.36
Actions to be required	35.07-10
Certificate of inspection regulation.....	31.05-1
Drills.....	35.10-1
Inspections required.....	31.01-1
Musters	35.10-5
Lights, flashing the ray of.....	35.20-30
Light List.....	35.20-1
Liquid, flammable	30.10-22
Liquid level gauging devices	32.20-20, 38.10-1, 38.10-20 39.20-3
Liquefied flammable gas.....	30.10-39
Cargo hose.....	38.15-5
Cargo piping	38.10-10
Certificate of inspection	38.01-5
Design and construction of cargo tanks.....	38.05-2
Design and construction of nonpressure vessel type cargo tanks	38.05-4
Design and construction of pressure vessel type cargo tanks.....	38.05-3

46 CFR Ch. I (10–1–99 Edition)

Design and construction of vessels, general.....	38.05-1
Electrical installations	38.15-15
Filling and discharge pipes	38.10-5
Filling of tanks	38.15-1
Installation of cargo tanks.....	38.05-10
Insulation	38.05-20
Leak detection systems.....	38.15-10
Liquid level gauging devices.....	38.10-20
Markings.....	38.05-5
Refrigerated systems.....	38.05-25
Remote shutdowns.....	38.15-20
Removal of defective tanks.....	38.25-5
Safety relief valves.....	38.25-10
Safety relief valves for pressure vessel type tanks.....	38.10-15
Scope of regulations.....	38.01-1
Tests and inspections.....	38.25-1
Transportation of.....	Part 38
Transportation of portable cylinders or portable tanks containing or having previously contained liquefied flammable gases in dry cargo spaces.....	38.01-2
Valves, fittings, and accessories	38.10-1
Vapor control system	Part 39
Ventilation	38.20-10
Venting.....	38.20-1, 38.20-5
Living quarters.....	32.60-25, 32.65-25
Load lines.....	Subpart 31.25
Loading information.....	31.10-32
Logbook entries:	
Actions required to be logged.....	35.07-10
Application	35.07-1
Draft of tank ship	35.20-5
Fire and lifeboat drills.....	35.10-5
Fuel oil requirements	35.25-10
Logbooks and records.....	35.07-5
Steering gear tests	35.20-10

M

Machinery spaces, fire extinguishing systems for	34.05-5
Machinery, main and auxiliary:	
Accident report by chief engineer.....	35.25-5
Air compressors	32.35-15
Construction	32.35-1
Design	32.35-1
Examination by engineer	32.25-1
Installation of internal combustion engines.....	32.35-5
Steering apparatus	32.35-10
Maneuvering characteristics, display of.....	35.20-40
Manning:	
Tank vessels.....	31.15, 35.35-1
Marine engineering and material specifications.....	Subpart 31.30
Marine inspector, authority of	31.01-10
Markings:	
Booms and cranes	31.37-45
CO ₂ alarm.....	35.40-7
Draft marks	32.05-1
Emergency breathing apparatus.....	35.40-20
Emergency lights.....	35.40-6

Subchapter D Index

Fire and emergency equipment.....	Subpart 35.40
Firehose stations.....	35.40-15
General alarm bell.....	35.40-5
General alarm bell switch.....	35.40-1
Lifesaving equipment.....	35.40-40
Portable fire extinguishers.....	35.40-25
Steam, foam or CO ₂ apparatus.....	35.40-10
Steering station.....	35.40-35
Tanks for liquefied flammable gas, marking of.....	38.05-5
Vapor control system piping.....	39.20-1
Vessel's name.....	32.05-10, 32.05-15
Vessel's name on equipment.....	32.05-5
Master:	
Casualty or accident report.....	35.15-1
Licensed officer.....	35.05-1
Station bills and muster list.....	35.10-1, 35.10-5
Master's and officer's responsibility.....	35.20-20
Matches:	
Use of.....	35.30-5
Materials specification.....	Subpart 31.30
Material, scantlings and workmanship.....	32.60-1, 32.65-1
Means of escape.....	32.02-1
Muster list.....	35.10-1, 35.10-5

N

Nautical publications.....	35.20-1
Navigation, use of Auto Pilot.....	35.20-45
Navigation equipment:	
Anchors for seagoing barges.....	32.15-15
Magnetic compass and gyro compass.....	32.15-35
Radar.....	32.15-30
Sounding machines.....	32.15-10
Whistles.....	32.15-5
New tank vessels, inspection of.....	31.10-5
New tank vessels, plans for inspection of.....	31.10-5(a)
Notice to mariners.....	35.20-1

O

Ocean, definition.....	30.10-45
Officer in Charge, Marine Inspection.....	30.10-47
Officers required on tank vessels.....	Subpart 35.05
Open hopper type barges.....	35.01-45
Overfill protection, liquid, tank barge.....	39.20-9
Overfill protection, liquid, tank ship.....	39.20-7
Overpressure and vacuum protection, vapor, tank barge and ship.....	39.20-11
Oxygen breathing apparatus, marking of.....	35.40-20

P

Paintrooms.....	Subparts 32.85, 34.05-05
Penalties for violations of regulations.....	30.20-10
Period covered by certificate of inspection.....	31.05-10
Permit definition.....	30.10-49
Permit to proceed to another port for repairs.....	31.10-35
Piping:	
Fire extinguishing systems.....	34.10-10, 34.10-15, 34.10-90, 34.15-15, 34.17-15, 34.20-15, 34.25-15

46 CFR Ch. I (10–1–99 Edition)

Piping, bilge.....	32.52-5
Piping, cargo.....	Subpart 32.50
Cargo tanks.....	38.10-10
Steering apparatus.....	32.35-10
Placard of lifesaving signals and breeches buoy instructions.....	Subpart 35.12
Application.....	35.12-1
Availability.....	35.12-5
Plans, Display of.....	35.10-3
Plans for inspection of new tank vessels.....	31.10-5(a)
Portable and semiportable extinguishers.....	34.05-10, 34.50
Portable tanks-interpretive rulings.....	30.01-20
Portable electrical equipment.....	35.30-30
Posting of certificate of inspection.....	31.05-5
Pressure-vacuum relief valve.....	30.10-55, 32.20-5
Prevention of oil pollution.....	35.01-40
Proof test of cargo gear as a unit.....	31.37-40
Protection for personnel.....	36.05-10
Pumprooms:	
Electrical installations.....	32.60-20
Fire extinguishing systems for.....	34.05-5
Lighting.....	32.60-20
Location of.....	32.60-20, 32.65-20
Requirements for.....	32.70-15, 32.70-20
Ventilation.....	32.60-20, 36.20-5
Pumps, bilge.....	32.60-20, 36.20-5
Pumps, cargo.....	32.52-1

Q

Quarters, living.....	32.60-25, 32.65-25
-----------------------	--------------------

R

Radar.....	32.15-30
Radio room warning signs.....	35.30-1
Recognized classification society, definition.....	30.10-57
Refrigerated systems.....	38.05-25
Registers regarding shipboard cargo gear.....	31.10-16, Subpart 31-37
Regulations:	
Application of.....	30.01-5
Authority vested in Commandant.....	30.01-1
Effective date.....	30.01-15
Explanation of vessel description.....	30.01-5
Governing alterations and repairs.....	30.01-10
Liquefied flammable gas.....	Part 38
Scope of.....	36.01-1
Vapor control system.....	Part 39
Reid vapor pressure, definition.....	30.10-59
Reinspection.....	31.10-17
Relief valves:	
Cargo pump.....	36.10-1
Cargo pump, testing of.....	35.35-70
Cargo tanks.....	38.10-15
Repairs:	
Application of regulations.....	30.01-10
Firefighting equipment.....	35.01-35
Inspection before making.....	35.01-1
Involving hot work.....	35.01-1
Permit to proceed to another port.....	31.10-35

Subchapter D Index

Reports of engineers.....	35.25-5
Right of appeal	30.20-50
Rivers, definition.....	30.10-61
Rudder:	
Indicators	35.40-35

S

Safety requirements:	
Means of escape.....	32.02-1
Safety relief valves for cargo tanks.....	38.10-15
Safety rules.....	Subpart 35.30
Safety valve seal, breaking of	35.25-20
Sailing directions.....	35.20-1
Sanitary inspection by master and chief engineer	35.01-5
Scantlings, material and workmanship.....	32.60-1, 32.65-5
Scuppers, closing of	35.35-10
Sea chests, examination of	31.10-20
Sea strainers, examination of.....	31.10-20
Sea valves, closing of.....	35.35-10
Segregation of spaces containing the emergency source of electric power	32.60-45
Shipboard cargo gear, certificates or registers.....	31.10-16, Subpart 31.37
Shipping papers required	35.01-10
Sleeping quarters	Subpart 32.40
Smoking safety rules	35.30-5
Sounding machines.....	32.15-10
Spark arrester	30.10-63
Spark producing devices.....	35.30-35
Spray nozzles	34.10-10
Specifications, material.....	Subpart 31.30
Special operating requirements	Subpart 35.01
Special operating requirements for tank barges carrying certain dangerous bulk cargoes	35.01-50
Stability requirements.....	31.10-30
Station bills required.....	35.10-1
Steam fire extinguishing systems, marking of.....	35.40-10
Steam, carrying of excess	35.25-15
Steam smothering system	Subpart 34.13
Steel hull tank vessels	Subparts 32.70, 32.60, 32.63, 32.65
Steering apparatus on tank vessel	32.35-10
Steering gear, instruction for changing	35.40-30
Steering gear test.....	35.20-10
Steering orders, marking	35.40-35
Stowage of package and general cargo	35.35-55
Subdivision of cargo spaces	32.60-5, 32.65-10

T

Tank barge:	
Carrying bulk cargoes having dangerous characteristics in addition to flammability and combustibility	35.01-50
Definition	30.10-65
Watchman for	35.05-15
Tankerman, definition	30.10-71
Tankship:	
Definition	30.10-67
Licensed officers and crew	35.05-1

46 CFR Ch. I (10–1–99 Edition)

Tanks, portable-interpretive rulings..... 30.01-20
Tank vessel:
 Definition 30.10-69
 Laid up or dismantled 31.01-1
Telegraph equipment, engine order Subpart 32.30
Telephone equipment, sound powered Subpart 32.30
Testing of firefighting equipment 31.10-19
Tide tables 35.20-1
Toilet facilities..... 32.40-25
Towing vessels..... 31.15-10, 35.35-45
Trial trip inspection 31.10-40

U

Ullage holes, safety rules regarding 35.30-10

V

Valves:
 Back pressure check type..... 38.10-1, 38.10-5
 Excess flow 38.10-1, 38.10-5
 Liquefied flammable gas 38.10-1, 38.10-5
 Pressure vacuum relief..... 30.10.55, 32.20.5
 Relief 35.35-70, 38.10-1, 38.10-10, 38.10-15
 Shutoff 38.10-1
Vapor balancing:
 Design and equipment for 39.40-3
 General requirements for 39.40-1
 Operational requirements for..... 39.40-5
Vapor collection system 39.20-1
Vapor control systems..... Part 39
 Applicability 39.10-1
 Cargo gauging system 39.20-3
 Definitions 39.10-3
 Design and equipment Subpart 39.20
 General requirements Subpart 39.10
 Lightering and topping-off operations with vapor balancing Subpart 39.40
 Operational requirements 39.30-1
 Operations..... Subpart 39.30
 Personnel training..... 39.10-11
 Submission of vapor control system designs 39.10-13
 Tank barge and ship vapor overpressure and vacuum protection..... 39.20-11
 Tank barge liquid overfill protection 39.20-9
 Tankship high and low vapor pressure protection..... 39.20-13
Vessel vapor processing units 39.10-9
Ventilation and venting:
 Cargo tanks..... Subpart 32.55
 Cargo tanks, independent Subpart 38.20
 Cofferdams Subpart 32.55
 Flame screen 36.20-1
 Hold spaces 32.55-15
 Pumproom..... 36.20-5
 Tank ships with a keel laying date on or after January 1, 1975 32.55-50
Vessels coming alongside 35.35-42
Vessels converted to tank vessels..... 31.10-10
Vessel's name on equipment 35.40-40
Vessel's name 32.05-10, 32.05-15
Voice tubes..... 32.30-1

Subchapter D Index

W

Warning signals and signs	35.30-1
Warning signs	35.30-1
Washing facilities	32.40-25
Watchman for tank barge	35.05-15
Water spray extinguishing systems, details	Subpart 34-25
Application	34.25-1
Capacity and arrangement	34.25-5
Controls	34.25-10
Installations contracted for prior to January 1, 1964	34.25-90
Piping	34.25-15
Spray nozzles	34.25-20
Water spray systems, marking of	35.40-18
Waters, travel permitted on	Subpart 31.20
Welding repairs	35.01-1
Whistles	32.15-5
Whistle signals for drills	35.10-5
Whistling, unnecessary	35.20-35
Wire rope	31.37-35, 31.37-50
Work vests:	
Application of	35.03-1
Approved unicellular plastic foam	35.03-5
Shipboard inspection	35.03-20
Shipboard stowage	35.03-15
Use	35.03-10
Workmanship, material, and scantlings	132.60-1, 32.65-5