(1) Maximum allowable pressure, as determined by the safety relief valve setting; or

(2) Design pressure, when cargo tanks operate at maximum allowable pressures reduced below the design pressure in order to satisfy special mechanical stress relief requirements.

NOTE: See the ASME Code, section VIII, appendix 3 for information on design pressure.

(c) For pressure vessels designed and/or supported such that they cannot safely be filled with water, the Commandant will consider a pneumatic test in lieu of the hydrostatic test. A leak test shall be performed in conjunction with the pneumatic test. Pneumatic testing shall be in accordance with subchapter F (Marine Engineering) of this chapter.

(d) Nonpressure vessel type tanks shall be tested to a pressure equal to the pressure on the bottom of the tank under the design conditions listed in § 38.05–4(e).

(e) In the application of the requirements for testing of the cargo tanks, the test shall in no case be less severe than the worst anticipated service condition of the cargo loading.

(f) In the design and testing of the independent cargo tanks, consideration shall be given to the possibility of the independent tanks being subjected to external loads.

[CGFR 66–33, 31 FR 15269, Dec. 6, 1966, as amended by CGD 85–061, 54 FR 50962, Dec. 11, 1989; USCG–2014–0688, 79 FR 58280, Sept. 29, 2014]

§ 38.25–3 Nondestructive testing—TB/ALL.

(a) Before nondestructive testing may be conducted to meet § 38.25–1 (a)(4) and (a)(5), the owner shall submit a proposal to the Officer in Charge, Marine Inspection for acceptance that includes—

(1) The test methods and procedures to be used, all of which must meet section V of the ASME Boiler and Pressure Vessel Code (1986);

(2) Each location on the tank to be tested; and

(3) The test method and procedure to be conducted at each location on the tank.

(b) If the Officer in Charge, Marine Inspection rejects the proposal, the Officer in Charge, Marine Inspection informs the owner of the reasons why the proposal is rejected.

(c) If the Officer in Charge, Marine Inspection accepts the proposal, then the owner shall ensure that—

(1) The proposal is followed; and

(2) Nondestructive testing is performed by personnel meeting ASNT ''Recommended Practice No. SNT-TC-1A (1988), Personnel Qualification and Certification in Nondestructive Testing.''

(d) Within 30 days after completing the nondestructive test, the owner shall submit a written report of the results to the Officer in Charge, Marine Inspection.

[CGD 85–061, 54 FR 50963, Dec. 11, 1989]

§ 38.25–5 Removal of defective tanks—TB/ALL.

If a tank fails to pass the tests prescribed in this subpart, it shall be removed from service unless otherwise authorized by the Commandant.

§ 38.25–10 Safety relief valves—TB/ALL.

(a) The cargo tank safety relief valves shall be inspected at least once in every 2 years.

(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 39.1000—General

Sec.

AUTHORITY: 42 U.S.C. 7511b(f)(2); 46 U.S.C. 3306, 3703, 3715(b), 70011, 70034; E.O. 12234, 45 FR 58801, 3 CFR, 1980 Comp., p. 277; Department of Homeland Security Delegation No. 0170.1.

EFFECTIVE DATE NOTE: By USCG–2020–0519, 89 FR 76696, Sept. 18, 2024, the authority citation for part 39 was revised, effective Oct. 18, 2024. For the convenience of the user, the revised text is set forth as follows:

AUTHORITY: 42 U.S.C. 7511b(f)(2); 46 U.S.C. 3306, 3703, 3715(b), 70011, 70034; E.O. 12234, 45 FR 58801, 3 CFR, 1980 Comp., p. 277; DHS Delegation No. 00170.1, Revision No. 01.4.

SOURCE: USCG–1999–5150, 78 FR 42642, July 16, 2013, unless otherwise noted.

Subpart 39.1000—General

§ 39.1001 Applicability—TB/ALL.

(a) This part applies to tank vessels that use a vapor control system (VCS) to collect vapors emitted to or from a vessel's cargo tanks while operating in the navigable waters of the United States, except—

(1) Tank vessels with an operating vapor collection system approved by the Coast Guard prior to July 23, 1990, for the collection and transfer of cargo vapor to specific facilities. Such tank vessels are only subject to 46 CFR 39.1013, 39.3001, and 39.4005; and

(2) A tank barge that collects vapors emitted from its cargo tanks during gas-freeing or cleaning operations at a cleaning facility. This type of tank barge is only subject to 46 CFR part 39, subparts 39.1000 and 39.6000, and must comply with requirements of these two subparts at the time of its next inspection for certification required by 46 CFR 31.10–15, but no later than August 15, 2018.

(b) This part does not apply to the collection of vapors of liquefied flammable gases as defined in 46 CFR 30.10–39.

(c) In this part, regulatory measurements, whether in the metric or English system, are sometimes followed by approximate equivalent measurements in parentheses, which are given solely for the reader's convenience. Regulatory compliance with the regulatory measurement is required.

§ 39.1003 Definitions—TB/ALL.

As used in this part only:

Barge vapor connection means the point in a barge's piping system where it connects to a vapor collection hose or arm. This may be the same as the barge's cargo connection while controlling vapors during tank barge cargo tank-cleaning operations.

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

Cargo tank venting system means the venting system required by 46 CFR 32.55.

Certifying entity means a certifying entity accepted by the Coast Guard as such pursuant to 33 CFR part 154, subpart P.

Cleaning facility means a facility used or capable of being used to conduct cleaning operations on a tank barge.

Cleaning operation means any stripping, gas-freeing, or tank-washing operation of a barge's cargo tanks conducted at a cleaning facility.

Commandant means the Commandant (CG–ENG), U.S. Coast Guard, 2100 2nd St. SW., Stop 7126, Washington, DC 20593–7126.

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

Fixed stripping line means a pipe extending to the low point of each cargo tank, which is welded through the deck and terminated above deck with a valve, and plugged at the open end.

Flammable liquid means a liquid as defined in 46 CFR 30.10–22.

Fluid displacement system means a system that removes vapors from a barge's cargo tanks during gas freeing through the addition of an inert gas or other medium into the cargo tank.

Fluid injection connection means the point in a fluid displacement system at which the fixed piping or hose that supplies the inert gas or other medium connects to a barge's cargo tanks or fixed piping system.

Gas freeing means the removal of vapors from a tank barge.

Independent as applied to two systems means that one system will operate when there is a failure of any part of the other system.

Inerted means the oxygen content of the vapor space in a cargo tank is reduced in accordance with the inert gas requirements of 46 CFR 32.53 or 33 CFR 153.500. If a cargo vapor in a cargo tank that is connected to the vapor collection system is defined as inerted at the start of cargo transfer, the oxygen content in the vapor space of the cargo tank must not exceed 60 percent by volume of the cargo's minimum oxygen concentration for combustion, or 8 percent by volume for vapor of crude oil, gasoline blends, or benzene.

Marine Safety Center (MSC) means Commanding Officer, Marine Safety Center, U.S. Coast Guard, 2703 Martin Luther King Jr. Avenue SE., Washington, DC 20593 for visitors. Send all mail to Commanding Officer (MSC), Attn: Marine Safety Center, U.S. Coast Guard Stop 7430, 2703 Martin Luther King Jr. Avenue SE., Washington, DC 20593–7430.

Maximum allowable gas-freeing rate means the maximum volumetric rate at which a barge may be gas-freed during cleaning operations.

Maximum allowable stripping rate means the maximum volumetric rate at which a barge may be stripped during cleaning operations prior to the opening of any hatch and/or fitting on the cargo tank being stripped.

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

Minimum oxygen concentration for combustion (MOCC) means the lowest level of oxygen in a vapor or vapor mixture that will support combustion.

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

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

Set pressure means the pressure at which the pressure or vacuum valve begins to open and the flow starts through the valve.

Stripping means the removal, to the maximum extent practicable, of cargo residue remaining in the barge's cargo tanks and associated fixed piping system after cargo transfer or during cleaning operations.

Vacuum displacement system means a system that removes vapors from a barge's cargo tanks during gas-freeing by sweeping air through the cargo tank hatch openings.

Vapor balancing means the transfer of vapor displaced by incoming cargo from the tank of a vessel or facility 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 to or from a vessel's cargo tanks and to transport the vapor to a vapor processing unit or a tank.

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

Vapor processing unit means the components of a VCS that recover, destroy, or disperse vapor collected from a vessel.

Vessel-to-vessel transfer (direct or through a shore loop) means either—

(1) The transfer of a bulk liquid cargo from a tank vessel to a service vessel; or

(2) 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.

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

[USCG–1999–5150, 78 FR 42642, July 16, 2013, as amended by USCG–2013–0671, 78 FR 60147, Sept. 30, 2013; USCG–2016–0498, 82 FR 35089, July 28, 2017]

§ 39.1005 Incorporation by reference—TB/ALL.

(a) Certain material is incorporated by reference (IBR) into this part with the approval of the Director of the Federal Register under 5 U.S.C. 552(a) and 1 CFR part 51. To enforce any edition other than that specified in this section, the Coast Guard must publish notice of change in the FEDERAL REGISTER and the material must be available to the public. All approved material is available for inspection at the Coast Guard Headquarters, Commandant (CG–ENG), Attn: Office of Design and Engineering Standards, U.S. Coast Guard Stop 7509, 2703 Martin Luther King Jr. Avenue SE, Washington, DC 20593–7509, telephone 202–372–1418 and at the National Archives and Records Administration (NARA). For information on the availability of this material at NARA, call 202–741–6030 or go to *http://www.archives.gov/federal_register/code_of_federal_regulations/ibr_locations.html*. Also, it is available from the sources indicated in this section.

(b) American National Standards Institute (ANSI), 25 West 43rd Street, 4th floor, New York, NY 10036.

(1) ANSI B16.5, Steel Pipe Flanges and Flanged Fittings, 1981, IBR approved for §§ 39.2001(i) and 39.6001(k).

(2) [Reserved]

(c) American Petroleum Institute (API), 1220 L Street NW., Washington, DC 20005.

(1) API Standard 2000, Venting Atmospheric and Low-Pressure Storage Tanks (Non-refrigerated and Refrigerated), Third Edition, January 1982 (reaffirmed December 1987)(''API 2000''), IBR approved for § 39.2011(b).

(2) [Reserved]

(d) ASTM International (ASTM), 100 Barr Harbor Drive, West Conshohocken, PA 19428–2959.

(1) ASTM F1122–87 (Reapproved1992)—Standard Specification for Quick Disconnect Couplings (''ASTM F1122''), IBR approved for § 39.2001(k).

(2) ASTM F1271—Standard Specification for Spill Valves for Use in Marine Tank Liquid Overpressure Protection Applications (''ASTM F1271''), December 29, 1989, IBR approved for § 39.2009(a).

(e) International Electrotechnical Commission (IEC), Bureau Central de la Commission Electrotechnique Internationale, 3, rue de Varembé, P.O. Box 131, CH—1211 Geneva 20, Switzerland.

(1) IEC 60309–1 Plugs, Socket-Outlets and Couplers for Industrial Purposes—Part 1: General Requirements, Edition 4.2 2012–06, IBR approved for § 39.2009(a).

(2) IEC 60309–2 Plugs, Socket-Outlets and Couplers for Industrial Purposes—Part 2: Dimensional Interchangeability Requirements for Pin and Contact-tube Accessories, Edition 4.2 2012–05, IBR approved for § 39.2009(a).

(f) International Maritime Organization (IMO), 4 Albert Embankment, London SE1 7SR, United Kingdom.

(1) International Convention for the Safety of Life at Sea, Consolidated Text of the 1974 SOLAS Convention, the 1978 SOLAS Protocol, the 1981 and 1983 SOLAS Amendments (1986) (''SOLAS''), IBR approved for § 39.2001(e).

(2) [Reserved]

(g) National Electrical Manufacturers Association (NEMA), 1300 North 17th Street, Suite 1752, Rosslyn, VA 22209.

(1) ANSI NEMA WD–6—Wiring Devices, Dimensional Requirements, 1988 (''NEMA WD–6''), IBR approved for § 39.2009(a)

(2) [Reserved]

(h) National Fire Protection Association (NFPA), 1 Batterymarch Park, Quincy, MA 02169–7471.

(1) NFPA 70—National Electrical Code, 2011, IBR approved for § 39.2009(a).

(2) [Reserved]

(i) Oil Companies International Marine Forum (OCIMF), 29 Queen Anne's Gate, London SWIH 9BU, England.

(1) International Safety Guide for Oil Tankers and Terminals, Fifth Edition, 2006 (''ISGOTT''), IBR approved for §§ 39.3001(g), 39.5001(c), 39.6001(g), and 39.6005(a).

(2) [Reserved]

[USCG–1999–5150, 78 FR 42642, July 16, 2013, as amended by USCG–2020–0304, 85 FR 58282, Sept. 18, 2020]

EFFECTIVE DATE NOTE: By USCG–2020–0519, 89 FR 76697, Sept. 18, 2024, § 39.1005 was amended by revising paragraph (a); redesignating paragraphs (g) through (i) as paragraphs (h) through (j); and adding new paragraph (g), effective Oct. 18, 2024. For the convenience of the user, the added and revised text is set forth as follows:

§ 39.1005 Incorporation by reference—TB/ALL.

(a) Certain material is incorporated by reference into this part with the approval of the Director of the Federal Register under 5 U.S.C. 552(a) and 1 CFR part 51. All approved incorporation by reference (IBR) material is available for inspection at the Coast Guard and at the National Archives and Records Administration (NARA). Contact Coast Guard at: Commandant (CG–ENG–4), U.S. Coast Guard Stop 7509, 2703 Martin Luther King Jr. Avenue SE, Washington, DC 20593–7509; email *typeapproval@uscg.mil* or visit *www.dco.uscg.mil/CG–ENG–4/*. For information on the availability of this material at NARA, visit *www.archives.gov/federal-register/cfr/ibr-locations.html* or email *fr.inspection@nara.gov*. The material may be obtained from the sources in the following paragraphs of this section.

* * * * *

(g) International Organization for Standardization (ISO), ISO Central Secretariat Chemin de Blandonnet 8. CP 401—1214 Vernier, Geneva, Switzerland phone 41 22 749 01 11; *www.iso.org/contact-iso.html*.

(1) ISO 15364:2021(E), Ships and Marine Technology—Pressure-vacuum valves for cargo tanks and devices to prevent the passage of flame into cargo tanks, Fourth Edition, February 2021 (''ISO 15364''); IBR approved for § 39.2011(b).

(2) [Reserved]

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§ 39.1009 Additional tank vessel vapor processing unit requirements—TB/ALL.

(a) Vapor piping, fitting, valves, flanges, and pressure vessels comprising the construction and installation of a permanent or portable vapor processing unit onboard a tank vessel must meet the marine engineering requirements of 46 CFR chapter I, subchapter F.

(b) Electrical equipment comprising the construction and installation of a permanent or portable vapor processing unit onboard a tank vessel must meet the electrical engineering requirements of 46 CFR chapter I, subchapter J.

(c) In addition to complying with the rules of this part, tank vessels with a permanent or portable vapor processing unit must comply with applicable requirements of 33 CFR part 154, subpart P.

(d) When differences between the requirements for vessels contained in 46 CFR chapter I, subchapters F and J and requirements for facilities contained in 33 CFR part 154, subpart P need to be resolved, the requirements of 46 CFR chapter I, subchapters F and J apply, unless specifically authorized by the Marine Safety Center.

§ 39.1011 Personnel training requirements—TB/ALL.

Personnel responsible for operating the vapor control system (VCS) must complete a training program prior to the operation of the system installed onboard the tank vessel. As part of the training program, personnel must be able to demonstrate, through drills and practical knowledge, the proper VCS operation procedures for normal and emergency conditions. The training program must cover the following subjects:

(a) Purpose of a VCS;

(b) Principles of the VCS;

(c) Components of the VCS;

(d) Hazards associated with the VCS;

(e) Coast Guard regulations in this part;

(f) Vapor control operation procedures during cargo transfer or tank barge cleaning, including:

(1) Testing and inspection requirements;

(2) Pre-transfer or pre-cleaning procedures;

(3) Connection sequence;

(4) Startup procedures; and

(5) Normal operations; and

(g) Emergency procedures.

§ 39.1013 U.S.-flagged tank vessel certification procedures for vapor control system designs—TB/ALL.

(a) For an existing Coast Guard-approved vapor control system (VCS) that has been operating before July 23, 1990, the tank vessel owner or operator must submit detailed engineering drawings, calculations, and specifications to the Marine Safety Center (MSC) for review and approval before modifying the system or transferring vapor to a facility that was not approved by the Coast Guard for that kind of vapor transfer.

(b) For a Coast Guard-approved vessel VCS that began operating on or after July 23, 1990, the tank vessel owner or operator must submit plans, calculations, and specifications to the MSC for review and approval before modifying the system.

(c) A tank vessel owner or operator must submit plans, calculations, and specifications for a new tank vessel VCS to the MSC for review and approval before installing the system. A permanent or portable vapor processing unit onboard a tank vessel will be reviewed, together with the tank vessel, as a complete and integrated system.

(d) Once the plan review and inspection of the tank vessel VCS satisfy the requirements of this part, the Officer in Charge, Marine Inspection (OCMI) will endorse the Certificate of Inspection for the U.S.-flagged tank vessel.

§ 39.1015 Foreign-flagged tank vessel certification procedures for vapor control system designs—TB/ALL.

As an alternative to meeting the requirements in 46 CFR 39.1013(a), (b), and (c), the owner or operator of a foreign-flagged tank vessel may submit certification by the classification society that classifies vessels under their foreign flags to the Marine Safety Center. Upon receipt of the certification stating that the vapor control system (VCS) meets the requirements of this part, the Officer in Charge, Marine Inspection (OCMI) will endorse the vessel's Certificate of Compliance for foreign-flagged tank vessels.

[USCG–1999–5150, 78 FR 42642, July 16, 2013, as amended by USCG–2020–0304, 85 FR 58282, Sept. 18, 2020]

§ 39.1017 Additional certification procedures for a tank barge vapor collection system design—B/ALL.

(a) For a tank barge vapor collection system intended for operation in multi-breasted loading using a single facility vapor connection, the tank barge owner or operator must submit plans, calculations, and specifications to the Marine Safety Center (MSC) for review and approval before beginning a multi-breasted loading operation.

(b) For a tank barge intended for collecting vapors emitted from its cargo tanks during gas-freeing or cleaning operations at a cleaning facility, the barge owner or operator must submit the following items to the MSC for review and approval:

(1) Stripping system plans and specifications, except those approved by the MSC on or before the August 15, 2013; and

(2) Stripping and/or gas-freeing rate calculations, except those approved by

the MSC on or before the August 15, 2013.

(c) Once the vapor collection system satisfies the requirements of this part, the Officer in Charge, Marine Inspection (OCMI) will endorse the Certificate of Inspection that the tank barge is acceptable for collecting vapors during cleaning operations.

Subpart 39.2000—Equipment and Installation

§ 39.2001 Vapor collection system—TB/ALL.

(a) Vapor collection piping must be fixed piping and the vessel's vapor connection must be located as close as practicable to the loading manifold, except—

(1) As allowed by the Commandant; and

(2) A vessel certificated to carry cargo listed in 46 CFR, part 151, Table 151.05 or part 153, Table 1 may use flexible hoses no longer than three meters (9.84 feet) for interconnection between fixed piping onboard the vessel to preserve segregation of cargo systems. These flexible hoses must also meet the requirements in paragraph (i) of this section, excluding paragraph (i)(5), and meet the following additional requirements:

(i) The installation of flexible hoses must include an isolation valve mounted on the tank side of the connection; and

(ii) Hose connections permitted under paragraph (a)(2) of this section are exempt from the requirements of paragraph (h) of this section.

(b) When collecting incompatible vapors simultaneously, vapors must be kept separate throughout the entire vapor collection system.

(c) Vapor collection piping must be electrically bonded to the hull and must be electrically continuous.

(d) The vapor collection system must have a mechanism to eliminate liquid condensation, such as draining and collecting liquid from each low point in the line.

(e) For a tankship that has an inert gas system, a mechanism must be in place to isolate the inert gas supply from the vapor control system (VCS). The inert gas main isolation valve required by chapter II–2, Regulation 62.10.8 of SOLAS (incorporated by reference, see 46 CFR 39.1005), may be used to satisfy this requirement.

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

(g) The tank vessel owner or operator must install an isolation valve capable of manual operation. It must be located at the vessel vapor connection and must clearly show whether the valve is in the open or closed position via an indicator, valve handle, or valve stem.

(h) The last 1.0 meter (3.3 feet) of vapor piping upstream of the vessel vapor connection and each end of a vapor hose must be—

(1) Painted in the sequence of red/yellow/red. The width of the red bands must be 0.1 meter (0.33 foot) and the width of the middle yellow band must be 0.8 meter (2.64 feet); and

(2) Labeled with the word ''VAPOR'' painted in black letters at least 50.8 millimeters (2 inches) high.

(i) Hoses that transfer vapors must meet the following requirements:

(1) Have a design burst pressure of at least 25 pounds per square inch gauge (psig);

(2) Have a maximum allowable working pressure no less than 5 psig;

(3) Be capable of withstanding at least a 2.0 pounds per square inch (psi) vacuum without collapsing or constricting;

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

(5) Have flanges with—

(i) A bolthole arrangement complying with the requirements for 150 pound class ANSI B16.5 flanges (incorporated by reference, see 46 CFR 39.1005); and

(ii) One or more 15.9 millimeter (0.625 inch) diameter hole(s) located midway between bolthole and in line with the bolthole pattern; and

(6) Be abrasion and kinking resistant.

(j) Each vessel vapor connection flange face must have a permanent stud projecting outward that has a 12.7 millimeter (0.5 inch) diameter and is at least 25.4 millimeters (1 inch) long. It must be located at the top of the flange face, midway between boltholes, and in line with the bolthole pattern.

(k) Quick disconnect couplings (QDCs) may be used instead of flanges at the flexible hose connection and fixed piping on tankships provided they meet ASTM F1122 (incorporated by reference, see 46 CFR 39.1005) and are designed as ''Standard Class QDC.''

(l) Hose saddles that provide adequate support to prevent kinking or collapse of hoses must accompany vapor hose handling equipment.

(m) For cargoes that have toxic properties, listed in 46 CFR Table 151.05 with the ''Special requirements'' column referring to 46 CFR 151.50–5, an overfill alarm and shutdown system that meet the requirements of 46 CFR 39.2007(a), 39.2009(a), or 39.2009(b) must be used for primary overfill protection. If the vessel is also equipped with spill valves or rupture disks, their setpoints must be set higher than the vessel's pressure relief valve setting as required by 46 CFR 39.2009(a)(3).

§ 39.2003 Cargo gauging system—TB/ALL.

(a) A cargo tank of the tank vessel connected to a vapor collection system must be equipped with a permanent or portable cargo gauging device that—

(1) Is a closed type as defined in 46 CFR 151.15.10(c) that does not require opening the tank to the atmosphere during cargo transfer;

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

(3) Has an indicator for the level of liquid in the tank that is located where cargo transfer is controlled; and

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

(b) Each cargo tank of a tank barge must have a high-level indicating device, unless the barge complies with 46 CFR 39.2009(a). The high-level indicating device must—

(1) Indicate visually the level of liquid in the cargo tank when the liquid level is within a range of 1 meter (3.28 feet) of the top of the tank;

(2) Show a permanent mark to indicate the maximum liquid level permitted under 46 CFR 39.3001(e) at even keel conditions; and

(3) Be visible from all cargo control areas.

§ 39.2007 Tankship liquid overfill protection—T/ALL.

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

(b) If installed after July 23, 1990, the high-level alarm and tank overfill alarm required by paragraph (a) of this section must—

(1) Be independent of each other;

(2) Activate an alarm in the event of loss of power to the alarm system;

(3) Activate an alarm during the failure of electrical circuitry to the tank level sensor; and

(4) Be able to be verified at the tank for proper operation prior to each transfer. This procedure may be achieved with the use of an electronic self-testing feature that monitors the condition of the alarm circuitry and sensor.

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

(1) Activate an alarm once the cargo level reaches 95 percent of the tank capacity or higher, but before the tank overfill alarm;

(2) Be identified with the legend ''High-level Alarm'' in black letters at least 50.8 millimeters (2 inches) high on a white background; and

(3) Activate a visible and audible alarm so that it can be seen and heard on the vessel where cargo transfer is controlled.

(d) The tank overfill alarm required by paragraph (a) of this section must—

(1) Be independent of the cargo gauging system;

(2) Be identified with the legend ''TANK OVERFILL ALARM'' in black letters at least 50.8 millimeters (2 inches) high on a white background;

(3) Activate a visible and audible alarm so that it can be seen and heard on the vessel where cargo transfer is controlled and in the cargo deck area; and

(4) Activate an alarm early enough to allow the person in charge of transfer operations to stop the cargo transfer before the 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 46 CFR 39.2009(a)(3).

(f) If a rupture disk is installed on a cargo tank fitted with a vapor collection system, it must meet the requirements of 46 CFR 39.2009(a)(4).

[USCG-1999-5150, 78 FR 42642, July 16, 2013, as amended by USCG–2016–0498, 82 FR 35089, July 28, 2017]

§ 39.2009 Tank barge liquid overfill protection—B/ALL.

(a) Each cargo tank of a tank barge must have one of the following liquid overfill protection arrangements:

(1) A system meeting the requirements of 46 CFR 39.2007 that—

(i) Includes a self-contained power supply;

(ii) Is powered by generators on the barge; or

(iii) Receives power from a facility and is fitted with a shore tie cable and a 120-volt, 20-ampere explosion-proof plug that meets—

(A) ANSI NEMA WD–6 (incorporated by reference, see 46 CFR 39.1005);

(B) NFPA 70, Articles 406.9 and 501–145 (incorporated by reference, see 46 CFR 39.1005); and

(C) 46 CFR 111.105–9;

(2) An intrinsically safe overfill control system that—

(i) Is independent of the cargo-gauging device required by 46 CFR 39.2003(a);

(ii) Activates an alarm and automatic shutdown system at the facility overfill control panel 60 seconds before the tank is 100 percent liquid-full during a facility-to-vessel cargo transfer;

(iii) Activates an alarm and automatic shutdown system on the vessel discharging cargo 60 seconds before the tank is 100 percent liquid-full during a vessel-to-vessel cargo transfer;

(iv) Can be inspected at the tank for proper operation prior to each loading;

(v) Consists of components that, individually or in series, will not generate or store a total of more than 1.2 volts (V), 0.1 amperes (A), 25 megawatts (MW), or 20 microJoules (μJ);

(vi) Has at least one tank overfill sensor switch per cargo tank that is designed to activate an alarm when its normally closed contacts are open;

(vii) Has all tank overfill sensor switches connected in series;

(viii) Has interconnecting cabling that meets 46 CFR 111.105–11(b) and (d), and 46 CFR 111.105–17(a); and

(ix) Has a male plug with a five-wire, 16–A connector body meeting IEC 60309–1 and IEC 60309–2 (both incorporated by reference, see 46 CFR 39.1005), that is—

(A) Configured with pins S2 and R1 for the tank overfill 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

(B) Labeled ''Connector for Barge Overflow Control System'' and labeled with the total inductance and capacitance of the connected switches and cabling;

(3) A spill valve that meets ASTM F1271 requirements (incorporated by reference, see 46 CFR 39.1005), and—

(i) Relieves at a predetermined pressure higher than the pressure at which the pressure relief valves meeting the requirements of 46 CFR 39.2011 operate;

(ii) Limits the maximum pressure at the top of the cargo tank during liquid overfill to not more than the maximum design working pressure for the tank when at the maximum loading rate for the tank; and

(iii) Has a means to prevent opening due to cargo sloshing while the vessel is in ocean or coastwise service; or

(4) A rupture disk arrangement that meets paragraphs (a)(3)(i), (ii), and (iii) of this section and is approved by the Commandant.

(b) A tank barge authorized to carry a cargo having toxic properties, meaning they are listed in 46 CFR Table 151.05 with the ''Special requirements'' column referring to 46 CFR 151.50–5, must comply with the requirements of 46 CFR 39.2001(m).

§ 39.2011 Vapor overpressure and vacuum protection—TB/ALL.

(a) The cargo tank venting system required by 46 CFR 32.55 must—

(1) Be capable of discharging cargo vapor at the maximum transfer rate plus the vapor growth for the cargo such that the pressure in the vapor space of each tank connected to the vapor control system (VCS) 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) Relieve at a pressure corresponding to a pressure in the cargo tank vapor space not less than 1.0 pounds per square inch gauge (psig);

(3) Prevent a vacuum, which generates in any tank connected to the vapor collection system during the withdrawal of cargo or vapor at maximum rates, in a cargo tank vapor space from exceeding the maximum design vacuum; and

(4) Not relieve at a vacuum corresponding to a vacuum in the cargo tank vapor space between 14.7 pounds per square inch absolute (psia) (0 psig) and 14.2 psia (−0.5 psig).

(b) Each pressure-vacuum relief valve must—

(1) Be of a type approved under 46 CFR 162.017, for the pressure and vacuum relief setting desired;

(2) Be tested for venting capacity in accordance with paragraph 1.5.1.3 of API 2000 (incorporated by reference, see 46 CFR 39.1005). The test 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 feet) per second; and

(3) If installed after July 23, 1991, have a mechanism to check that it operates freely and does not remain in the open position.

(c) A liquid filled pressure-vacuum breaker may be used for vapor overpressure and vacuum protection if the vessel owner or operator obtains the prior written approval of the Commandant.

(d) Vapor growth must be calculated following the Marine Safety Center guidelines available in Coast Guard VCS guidance at *http://homeport.uscg.mil*, or as specifically approved in writing by the Commandant after consultation with the Marine Safety Center.

EFFECTIVE DATE NOTE: By USCG–2020–0519, 89 FR 76697, Sept. 18, 2024, § 39.2011 was amended by revising paragraph (b)(1), effective Oct. 18, 2024. For the convenience of the user, the revised text is set forth as follows:

§ 39.2011 Vapor overpressure and vacuum protection—TB/ALL.

* * * * *

(b) * * *

(1) Be type approved under 46 CFR 162.017 for the pressure and vacuum relief setting desired. Pressure-vacuum relief valves that meet the requirements of ISO 15364 (incorporated by reference, see § 39.1005) or equivalent standards acceptable to the flag state are acceptable for installation on foreign-flagged vessels and do not require type approval;

* * * * *

§ 39.2013 High and low vapor pressure protection for tankships—T/ALL.

Each tankship with a vapor collection system must be fitted with a pressure-sensing device, located as close as practicable to the vessel vapor connection, that measures the pressure in the main vapor collection line, which—

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

(b) Has a high-pressure and a low-pressure alarm that—

(1) Gives an audible and a visible warning on the vessel where the cargo transfer is controlled;

(2) Activates an alarm when the pressure-sensing device measures a high pressure of not more than 90 percent of the lowest pressure relief valve setting in the cargo tank venting system; and

(3) Activates an alarm when the pressure-sensing device measures a low pressure of not less than 0.144 pounds per square inch gauge (psig) for an inerted tankship, or the lowest vacuum relief valve setting in the cargo tank venting system for a non-inerted tankship.

§ 39.2014 Polymerizing cargoes safety—TB/ALL.

(a) Common vapor headers for polymerizing cargoes must be constructed with adequate means to permit internal examination of vent headers.

(b) Vapor piping systems and pressure-vacuum valves that are used for polymerizing cargoes must be inspected internally at least annually.

(c) Pressure-vacuum valves and spill valves which are used for polymerizing cargoes must be tested for proper movement prior to each transfer.

§ 39.2015 Tank barge pressure-vacuum indicating device—B/ALL.

A fixed pressure-sensing device must be installed as close as practicable to the vessel vapor connection on a tank barge with a vapor collection system. The pressure-sensing device must measure the pressure vacuum in the main vapor collection line and have a pressure indicator located where the cargo transfer is controlled.

Subpart 39.3000—Vapor Collection Operations During Cargo Transfer

§ 39.3001 Operational requirements for vapor control systems during cargo transfer—TB/ALL.

(a) Vapor from a tank vessel may not be transferred to a facility in the United States, or vapor from a facility storage tank may not be transferred to a tank vessel, unless the facility's marine vapor control system (VCS) is certified by a certifying entity as meeting the requirements of 33 CFR part 154, subpart P and the facility's facility operations manual is marked by the local Coast Guard Captain of the Port (COTP) as required by 33 CFR 154.325(d).

(b) Vapor from a tank vessel may not be transferred to a vessel that does not have its certificate of inspection or certificate of compliance endorsed as meeting the requirements of this part and for controlling vapor of the cargo being transferred.

(c) For each cargo transferred using a vapor collection system, the pressure drop through the vapor collection system from the most remote cargo tank to the vessel vapor connection, including vapor hoses if used by the vessel, must be—

(1) Calculated at the maximum transfer rate and at lesser transfer rates;

(2) Calculated using a density estimate for the cargo vapor and air mixture, or vapor and inert gas mixture, based on a partial pressure (partial molar volumes) method for the mixture, assuming ideal gas law conditions;

(3) Calculated using a vapor growth rate as stated in 46 CFR 39.2011(d) for the cargo being transferred; and

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

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

(1) Eighty percent of the total venting capacity of the pressure relief valves in the cargo tank venting system when relieving at the set pressure.

(2) The total vacuum relieving capacity of the vacuum relief valves in the cargo tank venting system when relieving at the set pressure.

(3) For a given pressure at the facility vapor connection, or if vessel-to-vessel transfer at the vapor connection of the service vessel, then the rate based on pressure drop calculations at which 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) Cargo tanks 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 46 CFR 39.2007 or 39.2009(a)(2) is set.

(f) A cargo tank should remain sealed from the atmosphere during cargo transfer operations. The cargo tank may only be opened temporarily for gauging or sampling while the tank vessel is connected to a VCS as long as the following conditions are met:

(1) The cargo tank is not being filled or no vapor is being transferred into the cargo tank;

(2) For cargo loading, any pressure in the cargo tank vapor space is first reduced to atmospheric pressure by the VCS, except when the tank is inerted;

(3) The cargo is not required to be closed or restricted gauged by 46 CFR part 151, Table 151.05 or part 153, Table 1; and

(4) For static accumulating cargo, all metallic equipment used in sampling or gauging must be electrically bonded

to the vessel and remain bonded to the vessel until it is removed from the tank, and if the tank is not inerted, 30 minutes must have elapsed after any cargo transfer to the tank is stopped, before the equipment is put into the tank.

(g) For static accumulating cargo, the initial transfer rate must be controlled in accordance with OCIMF ISGOTT Section 11.1.7 (incorporated by reference, see 46 CFR 39.1005), in order to minimize the development of a static electrical charge.

(h) If cargo vapor is collected by a facility that requires the vapor from the vessel to be inerted in accordance with 33 CFR 154.2105, the oxygen content in the vapor space of each cargo tank connected to the vapor collection system must not exceed 60 percent by volume of the cargo's minimum oxygen concentration for combustion (MOCC), or 8 percent by volume for vapor of crude oil, gasoline blends, or benzene, at the start of cargo transfer. The oxygen content of each tank, or each area of a tank formed by each partial bulkhead, must be measured at a point 1.0 meter (3.28 feet) below the tank top and at a point equal to one-half of the ullage.

(i) If the vessel is equipped with an inert gas system, the isolation valve required by 46 CFR 39.2001(e) must remain closed during vapor transfer.

(j) Unless equipped with an automatic self-test and circuit-monitoring feature, each high-level alarm and tank overfill alarm on a cargo tank being loaded, required by 46 CFR 39.2007 or 39.2009, must be tested at the tank for proper operation within 24 hours prior to the start of cargo transfer.

Subpart 39.4000—Vessel-to-Vessel Transfers Using Vapor Balancing

§ 39.4001 General requirements for vapor balancing—TB/ALL.

(a) Vessels using vapor balancing while conducting a vessel-to-vessel transfer operation, directly or through a shore loop, must meet the requirements of this subpart in addition to the requirements of 46 CFR part 39, subparts 39.1000, 39.2000, and 39.3000. Arrangements other than vapor balancing used to control vapor emissions during a vessel-to-vessel transfer operation must receive approval from the Commandant.

(b) A vapor balancing operation must receive approval from the Commandant to use a compressor or blower to assist vapor transfer.

(c) 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.

(d) A vessel that intends to collect vapors (during a vessel-to-vessel transfer operation) from cargoes not previously approved must receive specific approval from the Commandant before beginning transfer operations.

§ 39.4003 Design and equipment for vapor balancing—TB/ALL.

(a) During transfer operations, if the cargo tanks are inerted on a vessel discharging cargo to a receiving vessel with inerted cargo tanks, the service vessel must—

(1) 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 feet) of the vessel vapor connection that—

(i) Activates a visible and an audible alarm on the service vessel where cargo transfer is controlled when the oxygen content in the vapor collection system exceeds 60 percent by volume of the cargo's minimum oxygen concentration for combustion (MOCC), or 8 percent by volume for vapor of crude oil, gasoline blends, or benzene;

(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 are not inerted on a vessel discharging cargo during transfer operations, and the cargo is flammable or combustible, the vapor collection line on the service vessel must be fitted with a detonation arrester that meets the requirements of 33 CFR 154.2106, and be located within 3 meters (9.74 feet) 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 each vessel operating a vessel-to-vessel cargo transfer.

§ 39.4005 Operational requirements for vapor balancing—TB/ALL.

(a) During a vessel-to-vessel transfer operation, each cargo tank being loaded must be connected by the vapor collection system to a cargo tank that 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 60 percent by volume of the cargo's minimum oxygen concentration for combustion (MOCC), or 8 percent by volume for vapor of crude oil, gasoline blends, or benzene. The oxygen content of each tank, or each area of a tank formed by each partial bulkhead, must be measured at a point 1 meter (3.28 feet) below the tank top and at a point equal to one-half of the ullage;

(2) Prior to starting transfer operations, the oxygen analyzer required by 46 CFR 39.4003(a) must be tested for proper operation;

(3) During transfer operations the oxygen content of vapors being transferred must be continuously monitored;

(4) Cargo transfer must be terminated if the oxygen content exceeds 60 percent by volume of the cargo's MOCC, or 8 percent by volume for vapor of crude oil, gasoline blends, or benzene;

(5) Transfer operations may resume once the oxygen content in the tanks of the vessel receiving cargo is reduced to 60 percent by volume or less of the cargo's MOCC, or 8 percent by volume or less for vapor of crude oil, gasoline blends, or benzene; and

(6) Prior to starting vapor transfer operations, the vapor transfer hose must be purged of air and inerted.

(c) The isolation valve located on the service vessel required by 46 CFR 39.2001(g) must not be opened until the pressure in the vapor collection system on the vessel receiving cargo exceeds the pressure in the vapor collection system on the vessel discharging cargo.

(d) The vessel discharging cargo must control the cargo transfer rate so that the transfer rate does not exceed—

(1) The authorized maximum discharge rate of the vessel discharging cargo;

(2) The authorized maximum loading rate of the vessel receiving cargo; or

(3) The processing rate of the approved vessel vapor processing system, if one is used to process the vapor collected during the transfer operations.

(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) Impressed current cathodic protection systems must be de-energized 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.

Subpart 39.5000—Multi-breasted Loading Using a Single Facility Vapor Connection

§ 39.5001 General requirements for multi-breasted loading—B/CLBR.

(a) Each barge must be owned or operated by the same entity and must have an approved vapor control system (VCS).

(b) There must be only one crossover vapor hose and it must—

(1) Comply with 46 CFR 39.2001(h) and (i);

(2) Have a diameter at least as that of the largest pipe in the outboard barge's VCS, and

(3) If it extends more than 25 feet (7.62 meters) between the two barges during the transfer operation, it must be as short as is practicable, safe for the conditions, supported off the vessels' decks, and its pressure drop calculations must be approved for its length by the Marine Safety Center

(MSC), or reapproved by the MSC if existing approval was based on a 25-foot hose.

(c) The hazards associated with barge-to-barge or barge-to-shore electric currents must be controlled in accordance with sections 11.9 or 17.5 of OCIMF ISGOTT (incorporated by reference, see 46 CFR 39.1005).

(d) The cargo transfer procedures must reflect the procedures to align and disconnect a facility VCS to and from an inboard barge, and alternately, to and from an outboard barge through the vapor cross-over hose and the inboard barge's vapor header, or ''dummy'' header. This must include proper connections for the facility VCS's alarm/shutdown system to the alarm/shutdown system of the barge being loaded at the time.

(e) Calculations for multi-breasted loading must consider additional pressure drops across the barges' vapor collection systems and the cross vapor hose and must be reviewed and approved by the MSC per 46 CFR 39.1017(a).

(f) Barge owners and operators must comply with any additional operational requirements imposed by the local Captain of the Port (COTP) in whose zone the shore facility is located. These facilities' VCSs must be certified for conducting such an operation.

§ 39.5003 Additional requirements for multi-breasted loading using an inboard barge vapor collection system—B/CLBR.

(a) Each barge must have at least one liquid overfill protection system that fulfills the requirements of 46 CFR 39.2009.

(b) The vapor header of an inboard barge that is used during outboard barge loading must—

(1) Be aligned with the vapor header of the outboard barge;

(2) Have a diameter at least as large as the diameter of the largest pipe in the vapor collection system of the outboard barge; and

(3) Be marked in accordance with 46 CFR 39.2001(h).

(c) A licensed tankerman, trained in and familiar with multi-breasted loading operations, must be onboard each barge during transfer operations. The tankerman serves as the barge person-in-charge (PIC). During transfer operations, the barge PICs must maintain constant communication with each other as well as with the facility PIC.

(d) If multi-breasted loading will be conducted using more than one liquid transfer hose from the shore facility, the facility must be capable of activating the emergency shutdown system required by 33 CFR 154.550. This will automatically stop the cargo flow to each transfer hose simultaneously, in the event an upset condition occurs that closes the remotely operated cargo vapor shutoff valve in the facility's vapor control system. Multi-breasted loading is prohibited unless the shore facility can comply with this requirement.

§ 39.5005 Additional requirements for multi-breasted loading using a "dummy" vapor header—B/CLBR.

(a) Each inboard barge ''dummy'' header used during outboard barge loading must—

(1) Be aligned with the vapor header of the outboard barge;

(2) Have a diameter at least as large as the diameter of the largest pipe in the vapor collection system of the outboard barge;

(3) Be marked in accordance with 46 CFR 39.2001(h); and

(4) Meet the same design and installation requirements for the vapor collection piping onboard the same barge.

(b) Flanges must meet the same design and installation requirements for flanges in the vapor collection system onboard the same barge.

(c) A stud must be permanently attached, as required in 46 CFR 39.2001(j), to the vapor connection flange on the ''dummy'' header.

Subpart 39.6000—Tank Barge Cleaning Operations with Vapor Collection

§ 39.6001 Design and equipment of vapor collection and stripping systems—B/ALL.

(a) Each barge engaged in cleaning operations at an approved cleaning facility must have a conductive fixed stripping line installed in each cargo

tank. The line must extend to the low point of each cargo tank, extend through and be welded to the top of the cargo tank, and terminate above deck with a full port valve plugged at the open end.

(b) An existing fixed stripping system may be used instead of the stripping line required in paragraph (a) of this section.

(c) Each stripping line must be labeled at an on-deck location with the words ''Stripping Line-Tank'' followed by the tank's number, name, or location.

(d) Vapors may be collected from the barge's cargo tanks through a common fixed vapor header, through the fixed liquid cargo header, or through flanged flexible hoses located at the top of each cargo tank.

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

(f) A barge being gas-freed by a fluid displacement system must fulfill the following requirements:

(1) If the fluid medium is a compressible fluid, such as inert gas, it must be injected into the barge's cargo tanks through a common fixed vapor header, through the fixed liquid cargo header, or through a flexible hoses flanged to a connection located at the top of each cargo tank;

(2) If the fluid medium is a non-compressible fluid, such as water, it must be injected into the barge's cargo tanks through the fixed liquid cargo header only; and

(3) If the fluid medium is a non-compressible fluid, such as water, the barge must be equipped with a liquid overfill protection arrangement and fulfill the requirements for tank barge liquid overfill protection contained in 46 CFR 39.2009.

(g) The barge vapor connection must be electrically insulated from the facility vapor connection and the fluid injection connection must be electrically insulated from the fluid injection source, if fitted, in accordance with OCIMF ISGOTT section 17.5 (incorporated by reference, see 46 CFR 39.1005).

(h) Vapor collection piping must be electrically bonded to the barge hull and must be electrically continuous.

(i) All equipment used on the barge during cleaning operations must be electrically bonded to the barge and tested to ensure electrical continuity prior to each use.

(j) Hoses used for the transfer of vapors during cleaning operations must meet the requirements of 46 CFR 39.2001(i) and have markings as required in 46 CFR 39.2001(h).

(k) Hoses used for the transfer of liquids during cleaning operations must—

(1) Have a designed burst pressure of at least 600 pounds per square inch gauge (psig);

(2) Have a maximum allowable working pressure of at least 150 psig;

(3) Be capable of withstanding at least the maximum vacuum rating of the cleaning facility's vapor-moving device without collapsing or constricting;

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

(5) Have flanges with a bolthole arrangement complying with the requirements for 150 pound class ANSI B16.5 flanges (incorporated by reference, see 46 CFR 39.1005); and

(6) Be abrasion and kinking resistant and compatible with the liquids being transferred.

(l) If a hose is used to transfer either vapor or liquid from the barge during cleaning operations, hose saddles that provide adequate support to prevent the collapse or kinking of hoses must accompany hose handling equipment.

§ 39.6003 Overpressure and underpressure protection during stripping or gas-freeing operations—B/ALL.

(a) The volumetric flow rates during stripping or gas-freeing operations must be limited within a range such that the cargo tank venting system required by 46 CFR 32.55 will keep the cargo tank within its maximum design working pressure or the maximum design vacuum.

(b) Each barge must be fitted with a means for connecting the pressure-sensing and pressure-indicating devices required by 33 CFR 154.2203(g) and (o) on each cargo tank top, or on the common vapor header provided that pressures measured by the devices are adjusted to compensate for the pressure drop across the vapor piping from the

cargo tank to the devices. The valve for the connection point must be labeled ''Pressure Sensor/indicator Connection.''

(c) For stripping operations with closed cargo tanks, the maximum stripping rate must not exceed the volumetric flow capacity of the vacuum relief valve protecting the cargo tank.

§ 39.6005 Inspection prior to conducting gas-freeing operations—B/ALL.

(a) The following inspections must be conducted by the barge person in charge prior to commencing gas-freeing operations, and show that—

(1) Each part of the barge's vapor collection system is aligned to allow vapor to flow to a cleaning facility's vapor control system (VCS);

(2) If a fluid displacement system is used to conduct gas-freeing operations—

(i) The fluid supply line is connected to the fluid injection connection; and

(ii) The maximum fluid injection rate is determined in accordance with 46 CFR 39.6007(c)(2);

(3) The maximum stripping or gas-freeing rate is determined in accordance with 46 CFR 39.6003(c) or 39.6007(c), respectively, and adequate openings required by 46 CFR 39.6007(c)(1) are available and identified;

(4) The pressure-sensing and pressure-indicating devices required by 33 CFR 154.2203 are connected as required by 46 CFR 39.6003(b);

(5) The maximum and minimum operating pressures of the barge being cleaned are determined;

(6) Unrepaired loose covers, kinks, bulges, gouges, cuts, slashes, soft spots, or any other defects which would permit the discharge of vapors through the vapor recovery hose material must be detected during inspection and repaired prior to operation;

(7) The facility vapor connection is electrically insulated from the barge vapor connection and the fluid injection connection is electrically insulated from the fluid injection source, if fitted, in accordance with OCIMF ISGOTT section 17.5 (incorporated by reference, see 46 CFR 39.1005); and

(8) All equipment is bonded in accordance with 46 CFR 39.6001(h).

§ 39.6007 Operational requirements for tank barge cleaning—B/ALL.

(a) During cleaning operations, vapors from a tank barge cannot be transferred to a cleaning facility which does not have a marine vapor control system (VCS) certified by a certifying entity, and its facility operations manual endorsed by the Captain of the Port (COTP) as meeting the requirements of 33 CFR part 154, subpart P.

(b) Prior to commencing stripping operations, the maximum allowable stripping rate must be determined. The maximum allowable stripping rate must not exceed the volumetric flow capacity of the vacuum relief valve protecting the cargo tank.

(c) The maximum gas-freeing rate is determined by the following:

(1) For a vacuum displacement system—

(i) The maximum allowable gas-freeing rate is a function of the area open to the atmosphere for the cargo tank being gas-freed. The area open to the atmosphere must be large enough to maintain the pressure in the cargo tank being gas-freed at or above 14.5 pounds per square inch absolute (psia) (−0.2 pounds per square inch gauge (psig));

(ii) The maximum allowable gas-freeing rate must be calculated from Table 1 of this section, using the area open to the atmosphere for the cargo tank being gas-freed as the entering determination;

(2) For a fluid displacement system, the maximum allowable gas-freeing rate is determined by the lesser of the following:

(i) Eighty percent of the total venting capacity of the pressure relief valve in the cargo tank venting system when relieving at its set pressure;

(ii) Eighty percent of the total vacuum relieving capacity of the vacuum relief valve in the cargo tank venting system when relieving at its set pressure; or

(iii) The rate based on pressure drop calculations at which, for a given pressure at the facility vapor connection, the pressure in the cargo tank being gas-freed exceeds 80 percent of the setting of any pressure relief valve in the cargo tank venting system.

(d) Any hatch and/or fitting used to calculate the minimum area required to be open to the atmosphere must be opened and secured in such a manner as to prevent accidental closure during gas freeing. All flame screens for the hatch and/or fitting opened must be removed in order to allow for maximum airflow. The hatch and/or fitting must be secured open before the pressure in the cargo tank falls below 10 percent of the highest setting of any of the barge's vacuum relief valves.

(e) ''Do Not Close Hatch/Fitting'' signs must be conspicuously posted near the hatch and/or fitting opened during gas-freeing operations.

(f) To minimize the dangers of static electricity, all equipment used on the barge during gas-freeing and cleaning operations must be electrically bonded to the barge and tested to ensure electrical continuity before each use.

(g) If the barge is equipped with an inert gas system, the inert gas main isolation valve must remain closed during cleaning operations.

(h) Vapors from incompatible cargoes that are collected simultaneously must be kept separated throughout the barge's entire vapor collection system. Chemical compatibility must be determined in accordance with the procedures contained in 46 CFR part 150, part A.

TABLE 1—MINIMUM OPEN AREA FOR BARGE CLEANING HATCHES

Air flow (CFM) (cubic feet/minute)	Air flow (CFS) (cubic feet/ second)	Open area (square inches)	Diameter opening (inches)	Square opening (inches)
500	8.3	10.7	3.7	3.3
600	10.0	12.8	4.0	3.6
700	11.7	15.0	4.4	3.9
800	13.3	17.1	4.7	4.1
900	15.0	19.3	5.0	4.4
1000	16.7	21.4	5.2	4.6
1100	18.3	23.6	5.5	4.9
1200	20.0	25.7	5.7	5.1
1300	21.7	27.8	6.0	5.3
1400	23.3	30.0	6.2	5.5
1500	25.0	32.1	6.4	5.7
1600	26.7	34.3	6.6	5.9
1700	28.3	36.4	6.8	6.0
1800	30.0	38.5	7.0	6.2
1900	31.7	40.7	7.2	6.4
2000	33.3	42.8	7.4	6.5
2100	35.0	45.0	7.6	6.7
2200	36.7	47.1	7.7	6.9
2300	38.3	49.3	7.9	7.0
2400	40.0	51.4	8.1	7.2
2500	41.7	53.5	8.3	7.3
2600	43.3	55.7	8.4	7.5
2700	45.0	57.8	8.6	7.6
2800	46.7	60.0	8.7	7.7
2900	48.3	62.1	8.9	7.9
3000	50.0	64.2	9.0	8.0
3100	51.7	66.4	9.2	8.1
3200	53.3	68.5	9.3	8.3
3300	55.0	70.7	9.5	8.4
3400	56.7	72.8	9.6	8.5
3500	58.3	75.0	9.8	8.7
3600	60.0	77.1	9.9	8.8
3700	61.7	79.2	10.0	8.9
3800	63.3	81.4	10.2	9.0
3900	65.0	83.5	10.3	9.1
4000	66.7	85.7	10.4	9.3

§ 39.6009 Barge person in charge: Designation and qualifications—B/ALL.

The designation and qualification requirements contained in 33 CFR 155.700 and 33 CFR 155.710(a)(2) apply to the barge person in charge.

PART 40 [RESERVED]