

**§ 154.820**

**33 CFR Ch. I (7-1-05 Edition)**

vapor collection hoses, and the under-sea pipeline as a function of the actual transfer rate.

(l) If the pressure in the vapor collection system can exceed 2.0 psig due to a malfunction in an inerting, enriching, or diluting system a pressure relief valve must:

(1) Be installed between the point where inerting, enriching, or diluting gas is introduced into the vapor collection system and the facility vapor connection;

(2) Relieve at a pressure such that the pressure in the vapor collection system at the facility vapor connection does not exceed 2.0 psig;

(3) Have a relieving capacity equal to or greater than the maximum capacity of the facility inerting, enriching, or diluting gas source;

(4) If not designed to insure a minimum vapor discharge velocity of 30 meters (98.4 ft.) per second, have a flame screen fitted at the discharge opening; and

(5) Have been tested for relieving capacity in accordance with paragraph 1.5.1.3 of API 2000.

(m) The relieving capacity test required by paragraph (l)(5) must be carried out with a flame screen fitted at the discharge opening if the pressure relief valve is not designed to insure a minimum vapor discharge velocity of 30 meters (98.4 ft.) per second.

[CGD 88-102, 55 FR 25429, June 21, 1990, as amended by USCG-1998-3799, 63 FR 35531, June 30, 1998]

**§ 154.820 Fire, explosion, and detonation protection.**

(a) A vapor control system with a single facility vapor connection that receives vapor only from a vessel with inerted cargo tanks and processes vapor with a vapor recovery unit must:

(1) Be capable of inerting the vapor collection line in accordance with § 154.824(a) of this subpart prior to receiving vapors from the vessel;

(2) Have at least one oxygen analyzer that samples the vapor concentration continuously at a point not more than 6 meters (19.7 ft.) from the facility vapor connection; and

(3) Meet § 154.824 (f)(1), (f)(2), (g), (h)(2), and (h)(3) of this subpart.

(b) A vapor control system with a single facility vapor connection that receives vapor only from a vessel with inerted cargo tanks and processes vapor with a vapor destruction unit must:

(1) Have a detonation arrester located not more than 6 meters (19.7 ft.) from the facility vapor connection; or

(2) Have an inerting system that meets the requirements of § 154.824 of this subpart.

(c) A vapor control system with a single facility vapor connection that receives vapor from a vessel with cargo tanks that are not inerted and processes vapor with a vapor recovery unit must:

(1) Have a detonation arrester located not more than 6 meters (19.7 ft.) from the facility vapor connection; or

(2) Have an inerting, enriching, or diluting system that meets the requirements of § 154.824 of this subpart.

(d) A vapor control system with a single facility vapor connection that receives vapor from a vessel with cargo tanks that are not inerted and processes the vapor with a vapor destruction unit must:

(1) Have a detonation arrester located not more than 6 meters (19.7 ft.) from the facility vapor connection; and

(2) Have an inerting, enriching, or diluting system that meets the requirements of § 154.824 of this subpart.

(e) A vapor control system with multiple facility vapor connections that processes vapor with a vapor recovery unit must have a detonation arrester located not more than 6 meters (19.7 ft.) from each facility vapor connection.

(f) A vapor control system with multiple facility vapor connections that processes vapor with a vapor destruction unit must:

(1) Have a detonation arrester located not more than 6 meters (19.7 ft.) from each facility vapor connection; and

(2) Have an inerting, enriching, or diluting system that meets the requirements of § 154.824 of this subpart.

(g) A vapor control system that uses a vapor balancing system in which cargo vapor from a vessel is transferred through the facility vapor collection system to facility storage tanks must:

(1) Have a detonation arrester located not more than 6 meters (19.7 ft.) from each facility vapor connection;

(2) Have a detonation arrester located within the storage tank containment area as close as practical to the vapor return connection of each facility storage tank; and

(3) Have facility storage tank high level alarm systems and facility storage tank overflow control systems arranged to prevent cargo from entering the vapor return line.

(h) Except for a discharge vent from a vapor destruction unit, each outlet of a vapor control system that vents to atmosphere and is not isolated with a pressure-vacuum relief valve must have a flame arrester located at the outlet.

**§ 154.822 Detonation arresters, flame arresters, and flame screens.**

(a) Each detonation arrester required by this part must:

(1) Be capable of arresting a detonation from either side of the device; and

(2) Be acceptable to the Commandant (G-MSO). A detonation arrester designed, built, and tested in accordance with appendix A of this part will be acceptable to the Commandant (G-MSO).

(b) Each flame arrester required by this part must be acceptable to the Commandant (G-MSO). A flame arrester designed, built, and tested in accordance with appendix B of this part will be acceptable to the Commandant (G-MSO).

(c) Each flame screen required by this part must be either a single screen of corrosion resistant wire of at least 30 by 30 mesh, or two screens, both of corrosion resistant wire, of at least 20 by 20 mesh, spaced not less than 12.7 millimeters (½ in.) or more than 38.1 millimeters (1½ in.) apart.

[CGD 88-102, 55 FR 25429, June 21, 1990; 55 FR 39270, Sept. 26, 1990, as amended by CGD 96-026, 61 FR 33666, June 28, 1996; USCG-2002-12471, 67 FR 41333, June 18, 2002]

**§ 154.824 Inerting, enriching, and diluting systems.**

(a) A vapor control system which uses inerting, enriching, or diluting gas must be capable of inerting, enriching, or diluting the vapor collection line prior to receiving cargo vapor.

(b) Except as permitted by § 154.820(a) of this subpart, a vapor control system which uses an inerting, enriching, or diluting system must be equipped with a gas injection and mixing arrangement located as close as practical but not more than 10 meters (32.8 ft.) from the facility vapor connection that ensures complete mixing of the gases within 20 pipe diameters of the injection point;

(c) A vapor control system that uses an inerting or enriching system may not be operated at a vacuum after the injection point unless:

(1) There are no sleeve-type pipe couplings, vacuum relief valves, or other devices which could allow air into the vapor collection system downstream of the injection point; or

(2) An additional analyzer is used to monitor the downstream vapor concentration and a means is provided to inject additional inerting or enriching gas.

(d) A vapor control system that uses analyzers to control the amount of inerting, enriching, or diluting gas injected into the vapor collection line must be equipped with at least 2 analyzers. The analyzers must be connected so that:

(1) When oxygen analyzers are used, the higher oxygen concentration reading controls the inerting or enriching system and activates the alarm and automatic shutdown system required by paragraph (h), (j) or (k)(2) of this section;

(2) When hydrocarbon analyzers are used, the lower hydrocarbon concentration reading controls the enriching system and activates the alarm and automatic shutdown system required by paragraph (i) or (k)(1) of this section; and

(3) When hydrocarbon analyzers are used, the higher hydrocarbon concentration reading controls the diluting system and activates the alarm and automatic shutdown system required by paragraph (l) of this section.

(e) A vapor control system that uses volumetric measurements to control the amount of inerting, enriching, or diluting gas injected into the vapor collection line must be equipped with at least one analyzer to activate the