

**§ 154.2109**

**33 CFR Ch. I (7-1-14 Edition)**

the vapor collection system, the compressor must be installed with indicators and audible and visible alarms to warn against the following conditions:

(1) Excessive gas temperature at the compressor outlet;

(2) Excessive cooling water temperature;

(3) Excessive vibration;

(4) Low lube oil level;

(5) Low lube oil pressure; and

(6) Excessive shaft bearing temperature.

(d) If the vapor is handled by a liquid ring-type compressor in the vapor collection system, it must be installed with indicators and audible and visible alarms to warn against the following conditions:

(1) Low level of liquid sealing medium;

(2) Lack of flow of the liquid sealing medium;

(3) Excessive temperature of the liquid sealing medium;

(4) Low lube oil level;

(5) Low lube oil pressure, if pressurized lubricating system; and

(6) Excessive shaft bearing temperature.

(e) If the vapor is handled by a centrifugal compressor, fan, or lobe blower in the vapor collection system, construction of the blades or housing must be one of the following:

(1) Blades or housing of nonmetallic construction;

(2) Blades and housing of nonferrous material;

(3) Blades and housing of corrosion resistant steel;

(4) Ferrous blades and housing with one-half inch or more design tip clearance;

(5) Nonferrous blades and ferrous housing with one-half inch or more design tip clearance; or

(6) Blades of aluminum or magnesium alloy and a ferrous housing with a nonferrous insert sleeve at the periphery of the impeller.

**§ 154.2109 Vapor recovery and vapor destruction units.**

Paragraphs (a), (b), and (e) of this section apply only to facilities collecting vapors of flammable, combustible, or non-high flash point liquid cargoes.

(a) The inlet to a vapor recovery unit that receives vapor that has not been inerted, enriched, or diluted in accordance with 33 CFR 154.2107 must be fitted with a detonation arrester.

(b) The inlet to a vapor destruction unit must—

(1) Have a liquid seal that meets the requirements of paragraph (e) of this section, except as specified by paragraph (b)(3) of this section; and

(2) Have two quick-closing stop valves installed in the vapor line. One of them must be installed upstream of the detonation arrester required by paragraph (c)(2) of this section. The quick-closing stop valves must—

(i) Close within 30 seconds after detection of a condition that requires the closing of these two quick-closing stop valves by a control component required by this subpart for a vapor control system (VCS) with a vapor destruction unit;

(ii) Close automatically if the control signal is lost;

(iii) Have a local valve position indicator or be designed so that the valve position is readily determined from the valve handle or valve stem position; and

(iv) If the valve seat is fitted with resilient material, be a Category A valve as defined by 46 CFR 56.20-15 and not allow appreciable leakage when the resilient material is damaged or destroyed; and

(3) Instead of a liquid seal as required by paragraph (b)(1) of this section, have the following:

(i) An anti-flashback burner accepted by the Commandant and installed at each burner within the vapor destruction unit; and

(ii) A differential pressure sensor that activates the quick-closing stop valves as required by paragraph (b)(2) of this section upon sensing a reverse flow condition.

(c) A vapor destruction unit must—

(1) Not be within 30 meters (98.8 feet) of any tank vessel berth or mooring at the facility;

(2) Have a detonation arrester fitted in the inlet vapor line; and

(3) Activate an alarm that satisfies the requirements of 33 CFR 154.2100(e) and shut down when a flame is detected on the detonation arrester.

(d) When a vapor destruction unit shuts down or has a flame-out condition, the vapor destruction unit control system must—

(1) Activate and close the quick-closing stop valves required by paragraph (b)(2) of this section;

(2) Close the remotely operated cargo vapor shutoff valve required by 33 CFR 154.2101(a); and

(3) Automatically shut down any vapor-moving devices installed in the VCS.

(e) If a liquid seal is installed at the inlet to a vapor destruction unit, then—

(1) The liquid used in the liquid seal must be compatible with the vapors being controlled;

(2) For partially or totally soluble cargoes that can polymerize in solution, there must be an adequate amount of inhibitor in the liquid seal;

(3) The liquid seal must be compatible with the design of the VCS and must not contribute to the flammability of the vapor stream; and

(4) The liquid seal must have a low-level alarm and a low-low level shutdown.

**§ 154.2110 Vapor balancing requirements.**

Paragraphs (a)(2) and (4), (b), and (c) of this section apply only to facilities transferring vapors of flammable, combustible, or non-high flash point liquid cargoes.

(a) A vapor control system (VCS) that uses a vapor balancing system in which cargo vapor is transferred from a vessel cargo tank or facility storage tank through the facility vapor collection system to a facility storage tank or vessel cargo tank must—

(1) Have facility storage tank high-level alarm systems and facility storage tank overfill control systems, independent of the high-level alarm system, arranged to prevent the cargo from entering the vapor return line;

(2) Have a detonation arrester located within the storage tank containment area and a detonation arrester located as close as practicable to the facility vapor connection. The total pipe length between the detonation arrester and the facility vapor connection must not exceed 18 meters (59.1 feet) and the

vapor piping between the detonation arrester and the facility vapor connection must be protected from any potential internal or external ignition source;

(3) Meet the overpressure and over-vacuum protection requirements of 33 CFR 154.2103; and

(4) As an alternative to paragraph (a)(2) of this section, inert cargo systems can meet the requirements of 33 CFR 2105(a)(1).

(b) A vapor balancing system, while in operation to transfer vapor to or from a vessel cargo tank and connected by way of the facility storage tank vent to a facility's main VCS with a vapor destruction unit, must have—

(1) A means to prevent backflow of vapor from the facility's main VCS to the marine vapor line; and

(2) Two fail-safe, quick-closing valves installed in the marine vapor line at the facility storage tank that automatically close when—

(i) Flame is detected on the facility storage tank; or

(ii) The temperature of the facility storage tank's vapor space reaches 177 °C (350 °F) or 70 percent of the vapor's auto-ignition temperature in degrees Celsius, whichever is lower.

(c) Transferring vapor from a non-inerted facility storage tank to a vessel cargo tank that is required to be inerted in accordance with 46 CFR 32.53, 153.500, or Table 151.05, is prohibited.

(d) A vapor balancing system that transfers vapor to a vessel cargo tank must not use a vapor-moving device to assist vapor transfer or inject inerting, enriching, or diluting gas into the vapor line without approval from the Commandant.

**§ 154.2111 Vapor control system connected to a facility's main vapor control system.**

(a) When a marine vapor control system (VCS), or a marine vapor collection system, is connected to a facility's main VCS serving other facility processing areas that are not related to tank vessel operations, the marine vapor line, before the point where the marine VCS connects to the facility's main VCS, must be fitted with—