

(2) Close the remotely operated cargo vapor shutoff valve required by §154.810(a) of this subpart when the oxygen concentration in the vapor collection line exceeds 16.5 percent by volume.

(k) An enriching system may be used in a vapor collection system that receives cargo vapor from a vessel with inerted cargo tanks if:

(1) Hydrocarbon analyzers are used to comply with paragraph (i)(2) and (i)(3) of this section; or

(2) If oxygen analyzers are used, the analyzers activate an alarm when the oxygen concentration in the vapor collection line exceeds 8 percent by volume, and close the remotely operated cargo vapor shutoff valve required by §154.810(a) of this subpart when the oxygen concentration exceeds 9 percent by volume.

(1) An air dilution system must:

(1) Supply sufficient additional air to the vapor stream to ensure that the hydrocarbon concentration throughout the vapor collection system is maintained below 30 percent by volume of the lower flammable limit;

(2) Activate an alarm when the hydrocarbon concentration in the vapor collection line exceeds 30 percent by volume of the lower flammable limit; and

(3) Close the remotely operated cargo vapor shutoff valve required by §154.810(a) of this subpart when the hydrocarbon concentration in the vapor collection line exceeds 50 percent by volume of the lower flammable limit.

[CGD 88-102, 55 FR 25429, June 21, 1990; 55 FR 39270, Sept. 26, 1990]

§ 154.826 Vapor compressors and blowers.

(a) Each inlet and outlet to a compressor or blower which handles vapor that has not been inerted, enriched, or diluted in accordance with §154.824 of this subpart must be fitted with:

(1) A detonation arrester;

(2) A flame arrester; or

(3) An explosion suppression system acceptable to the Commandant (G-MSO).

(b) If a reciprocating or screw-type compressor handles vapor in the vapor collection system, it must be provided with indicators and audible and visible

alarms to warn against the following conditions:

(1) Excessive discharge gas temperature at each compressor chamber or cylinder;

(2) Excessive cooling water temperature;

(3) Excessive vibration;

(4) Low lube oil level;

(5) Low lube oil pressure; and

(6) Excessive shaft bearing temperatures.

(c) If a liquid ring-type compressor handles vapor in the vapor collection system, it must be provided 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 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.

(d) If a centrifugal compressor, fan, or lobe blower handles vapor in the vapor collection system, construction of the blades and/or housing must meet 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; or

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

[CGD 88-102, 55 FR 25429, June 21, 1990, as amended by CGD 96-026, 61 FR 33666, June 28, 1996]

§ 154.828 Vapor recovery and vapor destruction units.

(a) The inlet to a vapor recovery unit which receives cargo vapor that has not been inerted, enriched, or diluted in accordance with §154.824 of this subpart must be fitted with one of the following:

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- (1) A detonation arrester;
 - (2) A flame arrester; or
 - (3) An explosion suppression system acceptable to the Commandant (G-MSO).
- (b) The inlet to a vapor destruction unit must:
- (1) Have a liquid seal; and
 - (2) Have two quick-closing stop valves installed in the vapor line.
- (c) A vapor destruction unit must:
- (1) Not be within 30 meters (98.8 ft.) of any tank vessel berth or mooring at the facility;
 - (2) Have a flame arrester or detonation arrester fitted in the vapor line; and
 - (3) Alarm and shut down when a flame is detected on the flame arrester or detonation arrester.
- (d) When a vapor destruction unit shuts down or has a flame-out condition the vapor destruction unit control system must:
- (1) Close the quick-closing stop valves required by paragraph (b)(2) of this section; and
 - (2) Close the remotely operated cargo vapor shutoff valve required by §154.810(a) of this subpart.

[CGD 88-102, 55 FR 25429, June 21, 1990, as amended by CGD 96-026, 61 FR 33666, June 28, 1996]

§ 154.840 Personnel training.

- (a) A person in charge of a transfer operation utilizing a vapor control system must have completed a training program covering the particular system installed at the facility. 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 subpart;
 - (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.

§ 154.850 Operational requirements.

- (a) A facility must receive vapors only from a vessel which has its certificate of inspection or certificate of compliance endorsed in accordance with 46 CFR 39.10-13(e).
- (b) The following must be performed not more than 24 hours prior to each transfer operation:
- (1) All alarms and automatic shut-down systems required by this part must be tested; and
 - (2) The analyzers required by §154.820(a), §154.824 (d) and (e) of this subpart must be checked for calibration by use of a span gas.
- (c) The position of all valves in the vapor line between the vessel's tanks and the facility vapor collection system must be verified prior to the start of the transfer operation.
- (d) A tank barge overfill control system that meets the requirements of 46 CFR 39.20-9(b) must not be connected to an overfill sensor circuit that exceeds the system's rated cable length, inductance, and capacitance.
- (e) When vapor is being received from a vessel with inerted cargo tanks, the remotely operated cargo vapor shutoff valve required by §154.810(a) of this subpart must not be opened until the pressure at the facility vapor connection exceeds the pressure on the downstream side of the remotely operated cargo vapor shutoff valve.
- (f) The initial cargo transfer rate must not exceed the rate agreed upon at the pre-transfer conference required by §156.120(w) of this chapter and 46 CFR 39.30-1(h).
- (g) The cargo transfer rate must not exceed the maximum allowable transfer rate as determined by the lesser of the following:
- (1) A transfer rate corresponding to the maximum vapor processing rate for the vapor control system, as specified in the facility operations manual required by §154.300 of this chapter; or