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(c) Each pressure relief valve must:

(1) Meet Subpart 162.018 of this chapter or, if the valve is also capable of vacuum relief and the MARVS is 69 kPa gauge (10 psig) or less, Subpart 162.017 of this chapter, and have at least the capacity required under § 154.806;

(2) Not be set for a higher pressure than the MARVS;

(3) Have a fitting for sealing wire that prevents the set pressure from being changed without breaking the sealing wire;

(4) Be fitted on the cargo tank to remain in the vapor phase under conditions of 15° list and of 0.015 L trim by both the bow and stern;

(5) Vent to a vent mast under § 154.805, except a relief valve may vent to a common tank relief valve header if the back pressure is included in determining the required capacity under § 154.806;

(6) Not vent to a common header or common vent mast if the relief valves are connected to cargo tanks carrying chemically incompatible cargoes;

(7) Not have any stop valves or other means of isolating the cargo tank from its relief valve unless:

(i) The stop valves are interlocked or arranged so that only one pressure relief valve is out of service at any one time;

(ii) The interlock arrangement automatically shows the relief valve that is out of service; and

(iii) The other valves have the relieving capacity required under § 154.806, or all relief valves on the cargo tank are the same size and there is a spare of the same size, or there is a spare for each relief valve on a cargo tank.

(d) The pressure relief system must:

(1) If the design temperature is below 0°C (32°F), be designed to prevent the relief valve from becoming inoperative due to ice formation; and

(2) Be designed to prevent chattering of the relief valve.

[CGD 74–289, 44 FR 26009, May 3, 1979; 44 FR 59234, Oct. 15, 1979]

§ 154.802 Alternate pressure relief settings.

Cargo tanks with more than one relief valve setting must have one of the following arrangements:

(a) Relief valves that:

(1) Are set and sealed under § 154.801(c);

(2) Have the capacity under § 154.806; and

(3) Are interlocked so that cargo tank venting can occur at any time.

(b) Relief valves that have spacer pieces or springs that:

(1) Change the set pressure without pressure testing to verify the new setting; and

(2) Can be installed without breaking the sealing wire required under § 154.801(c)(3).

§ 154.804 Vacuum protection.

(a) Except as allowed under paragraph (b) of this section, each cargo tank must have a vacuum protection system meeting paragraph (a)(1) of this section and either paragraph (a)(2) or (a)(3) of this section.

(1) There must be a means of testing the operation of the system.

(2) There must be a pressure switch that operates an audible and visual alarm in the cargo control station identifying the tank and the alarm condition and a remote group audible and visual alarm in the wheelhouse. Both alarms must be set at or below 80% of the maximum external design pressure differential of the cargo tanks. There must be a second, independent pressure switch that automatically shuts off all suction of cargo liquid or vapor from the cargo tank and secures any refrigeration of that tank at or below the maximum external design pressure differential.

(3) There must be a vacuum relief valve that:

(i) Has a gas flow capacity at least equal to the maximum cargo discharge rate per tank;

(ii) Is set to open at or below the maximum external design pressure differential; and

(iii) Admits inert gas, cargo vapor from a source other than a cargo vapor header, or air except as prohibited under § 154.1710.

(b) A vacuum protection system does not have to be installed if the cargo tank is designed to withstand:

(1) A maximum external pressure differential exceeding 24.5 kPa gauge (3.55 psig); and