

(b) 110 percent of the cargo's vapor pressure at the steady state temperature obtained by a full tank of cargo with the refrigeration system operating under ambient conditions described within the definition of a refrigerated tank in §153.2.

§ 153.372 Gauges and vapor return for cargo vapor pressures exceeding 100 kPa (approx. 14.7 psia).

When table 1 references this section, the containment system must have a:

- (a) Tank pressure gauge at the point where cargo flow is controlled during transfer; and
- (b) Vapor return connection.

[CGD 73-96, 42 FR 49027, Sept. 26, 1977; 42 FR 57126, Nov. 1, 1977, as amended by CGD 81-078, 50 FR 21173, May 22, 1985]

CARGO GAUGING SYSTEMS

§ 153.400 General requirements for gauges.

(a) Columnar gauge glasses must not be installed on a cargo containment system.

(b) Flat sight glasses must meet §38.10-20(h) of this chapter.

§ 153.404 Standards for containment systems having required closed gauges.

When Table 1 requires a cargo's containment system to have a closed gauge, the containment system must have the following:

- (a) A permanently installed closed gauging system.
- (b) A vapor return connection.
- (c) The high level alarm described in §153.409.
- (d) Either a closed cargo sampling system or a cargo sampling arrangement allowing the retrieval of a sample through an orifice not exceeding:

(1) 0.635 cm (approx. 0.25 in.) diameter when the cargo's vapor pressure is 28 kPa gauge (approx. 4 psig) or less; or

(2) 0.140 cm (approx. 0.055 in.) diameter when the cargo's vapor pressure exceeds 28 kPa (approx. 4 psig).

§ 153.406 Standards for containment systems having required restricted gauges.

When Table 1 requires a cargo's containment system to have a restricted

gauge, the containment system must have:

- (a) A closed gauging system; or
- (b) A system that has:
 - (1) A restricted gauge (e.g., a sounding tube) with an orifice diameter not exceeding 20 cm (approx. 7.8 in.);
 - (2) A permanently attached gauge cover that is vapor tight when in place; and
 - (3) A venting system that has either:
 - (i) Lock open PV valves; or
 - (ii) Valved bypasses around the PV valves.

§ 153.407 Special requirements for sounding tube gauges.

(a) A sounding tube installed as a restricted gauge must extend to within one meter (approx. 39.4 in.) of the bottom of the tank.

(b) A sounding tube must not be installed on a tank whose relief valve setting exceeds 28 kPa (approx. 4 psig) unless it is specifically permitted by the Commandant (CG-522).

(c) A sounding tube must have no perforations in the tube wall.

[CGD 73-96, 42 FR 49027, Sept. 26, 1977, as amended by CGD 82-063b, 48 FR 4782, Feb. 3, 1983]

§ 153.408 Tank overflow control.

(a) When table 1 references this section, a cargo containment system must have a cargo high level alarm meeting §153.409 and one of the following additional systems:

- (1) A second high level (cargo overflow) alarm.
- (2) A system that automatically stops cargo flow to the tank (automatic shutdown system).

(b) The high level alarm and the cargo overflow alarm or automatic shutdown system must:

- (1) Be independent of one-another; and
- (2) Operate on loss of power.

(c) The cargo overflow alarm or the automatic shutdown system must operate early enough to:

- (1) Stop the loading operation before the cargo tank overflows; and
- (2) Avoid surge pressures that exceed the working pressure specified in §153.294(b).