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§ 154.460 Design criteria.

At static angles of heel up through 30°, a secondary barrier must

(a) If a complete secondary barrier is required in § 154.459, hold all of the liquid cargo in the cargo tank for at least 15 days under the dynamic loads in § 154.409(e);

(b) If a partial secondary barrier is permitted in § 154.459, hold any leakage of liquid cargo corresponding to the extent of failure under § 154.448(a) after initial detection or primary barrier leak for at least 15 days under the dynamic loads in § 154.409(e);

(c) If the primary barrier fails, prevent the temperature of the vessel's structure from falling below the minimum allowable service temperature of the steel; and

(d) Be designed so that a cargo tank failure does not cause a failure in the secondary barrier.

INSULATION

§ 154.465 General.

If the design temperature is below −10°C (14°F), the cargo tank insulation must prevent the temperature of the vessel's hull from cooling below the minimum temperature allowed under § 154.172.

§ 154.466 Design criteria.

(a) The insulation for a cargo tank without a secondary barrier must be designed for the cargo tank at the design temperature, and for a vessel operating in:

(1) Any waters in the world, except Alaskan waters, for the ambient cold condition of:

(i) Five knots air at −18°C (0°F); and

(ii) Still sea water at 0°C (32°F); or

(2) Alaskan waters for the ambient cold condition of:

(i) Five knots air at −29°C (20°F); and

(ii) Still sea water at −2°C (28°F).

(b) The insulation for a cargo tank with a secondary barrier must be designed for the secondary barrier at the design temperature, and the ambient cold conditions listed under paragraph (a)(1) or paragraph (a)(2) of this section.

(c) The insulation material must be designed for any loads transmitted from adjacent hull structure.

(d) Insulation for cargo tank and piping must meet § 38.05–20 of this chapter.

(e) Powder or granulated insulation must:

(1) Not compact from vibrations of the vessel;

(2) Maintain the thermal conductivity listed under § 154.467; and

(3) Not exert a static pressure greater than the external design pressure of the cargo tank under § 154.408.

§ 154.467 Submission of insulation information.

The following insulation information must be submitted for special approval by the Commandant (G–MSO):

(a) Compatibility with the cargo.

(b) Solubility in the cargo.

(c) Absorption of the cargo.

(d) Shrinkage.

(e) Aging.

(f) Closed cell content.

(g) Density.

(h) Mechanical properties.

(i) Thermal expansion.

(j) Abrasion.

(k) Cohesion.

(l) Thermal conductivity.

(m) Resistance to vibrations.

(n) Resistance to fire and flame spread.

(o) The manufacturing and installation details of the insulation including:

(1) Fabrication;

(2) Storage;

(3) Handling;

(4) Erection; and

(5) Quality control.

[CGD 74–289, 44 FR 26009, May 3, 1979, as amended by CGD 82–063b, 48 FR 4782, Feb. 3, 1983]

SUPPORT SYSTEM

§ 154.470 General.

(a) A cargo tank must have a support system that:

(1) prevents movement of the cargo tank under the static and dynamic loads in § 154.406; and

(2) allows the cargo tank to contract and expand from temperature variation and hull deflection without exceeding the design stress of the cargo tank and the hull.

(b) The cargo tank support system must have a key that prevents rotation of the cargo tank.