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(b) Each tankship that has a cargo tank with a required cooling system must have a manual that contains:

(1) A piping diagram for the cooling system; and

(2) Instructions for changing over to the standby system described in paragraph (a) of this section.

[CGD 73–96, 42 FR 49027, Sept. 26, 1977, as amended by CGD 78–128, 47 FR 21209, May 17, 1982]

§ 153.434 Heat transfer coils within a tank.

When a cargo tank contains any quantity of cargo, a cargo cooling or heating system having coils within the tank must keep the heat transfer fluid at a pressure greater than the pressure exerted on the heating or cooling system by the cargo.

[CGD 78–128, 47 FR 21209, May 17, 1982]

§ 153.436 Heat transfer fluids: compatibility with cargo.

A heat transfer fluid separated from the cargo by only one wall (for example, the heat transfer fluid in a coil within a tank) must be compatible with the cargo under the standards prescribed for compatibility between two cargoes in Part 150 of this chapter.

[CGD 81–078, 50 FR 21174, May 22, 1985]

§ 153.438 Cargo pressure or temperature alarms required.

(a) Each refrigerated tank must have:

(1) An alarm that operates when the cargo's pressure exceeds the vapor pressure described in § 153.371(b); or

(2) An alarm that operates when the cargo's temperature exceeds the steady state temperature described in § 153.371(b).

(b) The alarm must give an audible and visual signal on the bridge and at the cargo control station.

(c) The cargo pressure or temperature alarm must be independent of other cargo pressure or temperature sensing arrangements.

§ 153.440 Cargo temperature sensors.

(a) Except as prescribed in paragraph (c) of this section, when Table 1 refers to this section, the containment system must meet the following requirements:

(1) A heated or refrigerated cargo tank must have a remote reading thermometer sensing the temperature of the cargo at the bottom of the tank.

(2) A refrigerated tank must have a remote reading second thermometer near the top of the tank and below the maximum liquid level allowed by § 153.981.

(3) Unless waived under § 153.491(a), a cargo tank endorsed to carry a Category A, B, or C NLS cargo must have a thermometer whose temperature reading is no greater than the temperature of the cargo at a level above the tank bottom at least one-eighth but no more than one-half the height of the tank if the cargo is—

(i) A Category A NLS or a Category B NLS having a viscosity of at least 25 mPa.s at 20 °C;

(ii) A Category C NLS having a viscosity of at least 60 mPa.s at 20 °C; or

(iii) A Category A, B, or C NLS that has a melting point greater than 0 °C.

(b) A readout for each remote thermometer required by this section must be at the point where cargo transfer is controlled.

(c) A portable thermometer may be substituted for the equipment required in paragraphs (a) and (b) of this section if—

(1) Table 1 allows open gauging with the cargo; or

(2) Table 1 allows restricted gauging with the cargo, and the portable thermometer is designed to be used through the containment system's restricted gauging system.

[CGD 78–128, 47 FR 21209, May 17, 1982, as amended by CGD 81–101, 52 FR 7781, Mar. 12, 1987; CGD 81–101, 53 FR 28974, Aug. 1, 1988 and 54 FR 12629, Mar. 28, 1989]

Special Requirements for Flammable or Combustible Cargoes

§ 153.460 Fire protection systems.

Each self-propelled ship and each manned non-self-propelled ship must meet the following:

(a) With the exception of the vent riser, each part of a cargo containment system exposed on the weatherdeck must be covered by the fire protection system listed beside the cargo in Table 1 and described in the footnotes to Table 1.