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as required under § 154.1854 if the gas fuel supply is cut-off.

§ 154.706 Cargo boil-off as fuel: Fuel lines.

(a) Gas fuel lines must not pass through accommodation, service, or control spaces. Each gas fuel line passing through other spaces must have a master gas fuel valve and meet one of the following:

(1) The fuel line must be a double-walled piping system with the annular space containing an inert gas at a pressure greater than the fuel pressure. Visual and audible alarms must be installed at the machinery control station to indicate loss of inert gas pressure.

(2) The fuel line must be installed in a mechanically exhaust-ventilated pipe or duct, having a rate of air change of at least 30 changes per hour. The pressure in the space between the inner pipe and outer pipe or duct must be maintained at less than atmospheric pressure. Continuous gas detection must be installed to detect leaks in the ventilated space. The ventilation system must meet § 154.1205.

(b) Each double wall pipe or vent duct must terminate in the ventilation hood or casing under § 154.707(a). Continuous gas detection must be installed to indicate leaks in the hood or casing.

§ 154.707 Cargo boil-off as fuel: Ventilation.

(a) A ventilation hood or casing must be installed in areas occupied by flanges, valves, and piping at the fuel burner to cause air to sweep across them and be exhausted at the top of the hood or casing.

(b) The hood or casing must be mechanically exhaust-ventilated and meet § 154.1205.

(c) The ventilated hood or casing must have an airflow rate specially approved by the Commandant.

§ 154.708 Cargo boil-off as fuel: Valves.

(a) Gas fuel lines to the gas consuming equipment must have two fail-closed automatic valves in series. A third valve, designed to fail-open, must vent that portion of pipe between the two series valves to the open atmosphere.

(b) The valves under paragraph (a) of this section must be arranged so that loss of boiler forced draft, flame failure, or abnormal gas fuel supply pressure automatically causes the two series valves to close and the vent valve to open. The function of one of the series valves and the vent valve may be performed by a single three-way valve.

(c) A master gas fuel valve must be located outside the machinery space, but be operable from inside the machinery space and at the valve. The valve must automatically close when there is:

(1) A gas leak detected under § 154.706(a)(2) or § 154.706(b);

(2) Loss of the ventilation under § 154.706(a)(2) or § 154.707(c); or

(3) Loss of inert gas pressure within the double-walled piping system under § 154.706(a)(1).

§ 154.709 Cargo boil-off as fuel: Gas detection equipment.

(a) The continuous gas detection system required under § 154.706(a)(2) and (b) must:

(1) Meet § 154.1350(c), (d), and (j) through (s); and

(2) Have a device that:

(i) Activates an audible and visual alarm at the machinery control station and in the wheelhouse if the methane concentration reaches 1.5 percent by volume; and

(ii) Closes the master gas fuel valve required under § 154.708(c) before the methane concentration reaches 3 percent by volume.

(b) The number and arrangement of gas sampling points must be specially approved by the Commandant (G–MSO).

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

CARGO VENT SYSTEMS

§ 154.801 Pressure relief systems.

(a) Each cargo tank that has a volume of 20m^3 (706 $ft.^3$) or less must have at least one pressure relief valve.

(b) Each cargo tank that has a volume of more than 20m^3 (706 $ft.^3$) must have at least two pressure relief valves of the same nominal relieving capacity.