

than the pressure under paragraph (b) of this section.

(d) The COW system must have two or more pumps that are capable of supplying oil to the COW machines.

(e) The COW system must be designed to meet the requirements of this subpart with any one pump not operating.

§ 157.128 Stripping system.

(a) Each tank vessel having a COW system under § 157.10(e), § 157.10a(a)(2), or § 157.10c(b)(2) must have a stripping system that is designed to remove crude oil from—

(1) Each cargo tank at 1.25 times the rate at which all the COW machines that are designed to simultaneously wash the bottom of the tank, are operating; and

(2) The bottom of each tank to allow the tank vessel to pass the inspection under § 157.140(a)(2).

(b) Each cargo tank must be designed to allow the level of crude oil in the tank to be determined by:

(1) Hand dipping at the aftermost portion of the tank and three other locations; or

(2) Any other means accepted by the Commandant.

(c) Each stripping system must have at least one of the following devices for stripping oil from each cargo tank:

- (1) A positive displacement pump.
- (2) A self-priming centrifugal pump.
- (3) An eductor

(4) Any other device accepted by the Commandant.

(d) There must be a means in the stripping system piping between the device under paragraph (c) of this section and each cargo tank to isolate each tank from the device.

(e) If the stripping system has a positive displacement pump or a self-priming centrifugal pump, the stripping system must have the following:

- (1) In the stripping system piping:
 - (i) A pressure gauge at the inlet connection to the pump; and
 - (ii) A pressure gauge at the discharge connection to the pump.
- (2) At least one of the following monitoring devices to indicate operation of the pump.
 - (i) Flow indicator.
 - (ii) Stroke counter.
 - (iii) Revolution counter.

(f) If the stripping system has an eductor, the stripping system must have:

(1) A pressure gauge at each driving fluid intake and at each discharge; and

(2) A pressure/vacuum gauge at each suction intake.

(g) The equipment required under paragraphs (e) and (f) of this section must have indicating devices in the cargo control room or another location that is accepted by the Commandant.

[CGD 77-058b, 45 FR 43709, June 30, 1980, as amended by CGD 82-28, 50 FR 11627, Mar. 22, 1985]

§ 157.130 Crude oil washing with more than one grade of crude oil.

If a tank vessel having a COW system under §§ 157.10(e), 157.10a(a)(2), or 157.10c(b)(2) carries more than one grade of crude oil, the COW system must be capable of washing the cargo tanks with the grades of crude oil that the vessel carries.

[CGD 82-28, 50 FR 11627, Mar. 22, 1985]

§ 157.132 Cargo tanks: Hydrocarbon vapor emissions.

Each tank vessel having a COW system under § 157.10a(a)(2) or § 157.10c(b)(2) without sufficient segregated ballast tanks or dedicated clean ballast tanks to allow the vessel to depart from any port in the United States without ballasting cargo tanks must have—

(a) A means to discharge hydrocarbon vapors from each cargo tank that is ballasted to a cargo tank that is discharging crude oil; or

(b) Any other means accepted by the Commandant that prevents hydrocarbon vapor emissions when the cargo tanks are ballasted in port.

[CGD 77-058b, 45 FR 43709, June 30, 1980, as amended by CGD 82-28, 50 FR 11628, Mar. 22, 1985]

§ 157.134 Cargo tank drainage.

Each cargo tank must be designed for longitudinal and transverse drainage of crude oil to allow the tank vessel to pass the inspections under § 157.140.

§ 157.136 Two-way voice communications.

Each tank vessel having a COW system under § 157.10(e), § 157.10a(a)(2), or

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§157.10c(b)(2) must have a means that enables two-way voice communications between the main deck watch required under §157.168 and each cargo discharge control station.

[CGD 82-28, 50 FR 11628, Mar. 22, 1985]

§ 157.138 Crude Oil Washing Operations and Equipment Manual.

(a) Each *Crude Oil Washing Operations and Equipment Manual* must include the following information:

(1) The text of the Annex of Resolution 15 of the MARPOL 73/78.

(2) A line drawing of the tank vessel's COW system showing the locations of pumps, piping, and COW machines.

(3) A description of the COW system.

(4) The procedure for the inspection of the COW system during COW operations.

(5) Design characteristic information of the COW system that includes the following:

(i) Pressure and flow of the crude oil pumped to the COW machines.

(ii) Revolutions, number of cycles, and length of cycles of each COW machine.

(iii) Pressure and flow of the stripping suction device.

(iv) Number and location of COW machines operating simultaneously in each cargo tank.

(6) The design oxygen content of the gas or mixture of gases that is supplied by the inert gas system to each cargo tank.

(7) The results of the inspections recorded when passing the inspections under §157.140.

(8) Characteristics of the COW system recorded during the COW operations when passing the inspections under §157.140 that includes the following:

(i) Pressure and flow of the crude oil pumped to the COW machines.

(ii) Revolutions, number of cycles, and length of cycles of each COW machine.

(iii) Pressure and flow of the stripping device.

(iv) Number and location of COW machines operating simultaneously in each cargo tank.

(9) The oxygen content of the gas or mixture of gases that is supplied by the inert gas system to each cargo tank re-

corded during COW operations when passing the inspections under §157.140.

(10) The volume of water used for water rinsing recorded during COW operations when passing the inspections under §157.140.

(11) The trim conditions of the tank vessel recorded during COW operations when passing the inspections under §157.140.

(12) The procedure for stripping cargo tanks of crude oil.

(13) The procedure for draining and stripping the pumps and piping of the COW system, cargo system, and stripping system after each crude oil cargo discharge.

(14) The procedure for crude oil washing cargo tanks that includes the following:

(i) The tanks to be crude oil washed to meet §157.160.

(ii) The order in which those tanks are washed.

(iii) The single-stage or multi-stage method of washing each tank.

(iv) The number of COW machines that operate simultaneously in each tank.

(v) The duration of the crude oil wash and water rinse.

(vi) The volume of water to be used for water rinse in each tank.

(15) The procedures and equipment needed to prevent leakage of crude oil from the COW system.

(16) The procedures and equipment needed if leakage of crude oil from the COW system occurs.

(17) The procedures for testing and inspecting the COW system for leakage of crude oil before operating the system.

(18) The procedures and equipment needed to prevent leakage of crude oil from the steam heater under §157.122(i) to the engine room.

(19) The number of crew members needed to conduct the following:

(i) The discharge of cargo.

(ii) The crude oil washing of cargo tanks.

(iii) The simultaneous operations in paragraphs (a)(19) (i) and (ii) of this section.

(20) A description of the duties of each crew member under paragraph (a)(19) of this section.