

(1) 90 percent or more of the total horizontal area of all the:

- (i) Tank bottoms;
- (ii) Upper surfaces of large primary structural members; and
- (iii) Upper surfaces of any other structural member determined to be equivalent to a large primary structural member by the Commandant.

(2) 85 percent or more of the total vertical area of all the tank sides and swash bulkheads.

(g) Each single nozzle COW machine that is mounted to the deck must have a means located outside of the cargo tank that indicates the arc and rotation of the movement of the COW machine during COW operations.

(h) Each multi-nozzle COW machine that is mounted to the deck must have a means located outside of the cargo tank that indicates the movement of the COW machine during COW operations.

(i) Each COW machine mounted to or close to the bottom of a tank without a means located outside of the cargo tank that indicates movement of the machine must not be programmable.

NOTES: 1. In the calculations to meet §157.124 (e) or (f), areas that are shielded from direct impingement by structural members other than large primary structural members or swash bulkheads can be calculated as areas being washed by direct impingement.

2. One or more types of COW machines could be used to meet §157.124 (e) or (f).

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

#### § 157.126 Pumps.

(a) Crude oil must be supplied to the COW machines by COW system pumps or cargo pumps.

(b) The pumps under paragraph (a) of this section must be designed and arranged with sufficient capacity to meet the following:

(1) A sufficient pressure and flow is supplied to allow the simultaneous operation of those COW machines designed to operate simultaneously.

(2) If an eductor is used for tank stripping, enough driving fluid is provided by the pumps to allow the eductor to meet §157.128(a).

(c) There must be means on the tank vessel to maintain the pressure under

paragraph (b) of this section when shore terminal back pressure is less 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.