

§ 157.21

meters or $(400) \times (\sqrt[3]{\text{DWT}})$ whichever is greater, limited to a maximum of 40,000 cubic meters);

(2) The volume of each wing tank and center tank is less than the allowable volume of a wing tank (VOL_w) and the allowable volume of a center tank (VOL_c) respectively; and

(3) The length of a tank is less than the allowable length of a tank (l_a).

(c) If a cargo transfer system interconnects two or more cargo tanks, the system must have valves to segregate the tanks from each other.

(d) If a line of piping that runs through a cargo tank in a position less than t_c from the vessel's side or less than v_s from the vessel's bottom as defined in Appendix A of this part, has a branch, that branch must have a stop valve:

(1) Within each cargo tank into which the branch opens; or

(2) Outside each tank into which the branch opens in a location that is immediately adjacent to the point at which the branch enters the tank.

(e) If piping that serves suction wells is installed within a double bottom, that piping must be:

(1) Fitted with valves located at the point of connection to the tank served to prevent oil outflow in the event of damage to the piping; and

(2) Designed to be installed as high from the bottom shell as possible.

[CGD 74-32, 40 FR 48283, Oct. 14, 1975, as amended by CGD 75-240, 41 FR 54180, Dec. 13, 1976; CGD 76-088b, 48 FR 45720, Oct. 6, 1983; USCG-2000-7223, 65 FR 40058, June 29, 2000]

§ 157.21 Subdivision and stability.

A new vessel that is a U.S. vessel must meet the following subdivision and damage stability criteria after assuming side and bottom damages, as defined in Appendix B of this Part. A U.S. vessel that meets the requirements in this section is considered by the Coast Guard as meeting 46 CFR 42.20-5.

(a) The final waterline, taking into account sinkage, heel, and trim, must be below the lower edge of an opening through which progressive flooding may take place, such as an air pipe, or any opening that is closed by means of a weathertight door or hatch cover.

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This opening does not include an opening closed by a:

(1) Watertight manhole cover;

(2) Flush scuttle;

(3) Small watertight cargo tank hatch cover that maintains the high integrity of the deck;

(4) Remotely operated watertight sliding door; or

(5) Side scuttle of the non-opening type.

(b) In the final stage of flooding, the angle of heel due to unsymmetrical flooding must not exceed 25 degrees, except that this angle may be increased to 30 degrees if no deck edge immersion occurs.

(c) For acceptable stability in the final stage of flooding, the righting lever curve must have a range of at least 20 degrees beyond the position of equilibrium in association with a maximum residual righting lever of at least 0.1 meter. For the calculations required in this section, weathertight openings or openings fitted with automatic closures (e.g., a vent fitted with a ball check valve), need not be considered as points of downflooding within the range of residual stability, but other openings must be accounted for in the calculation.

[CGD 74-32, 40 FR 48283, Oct. 14, 1975, as amended by CGD 75-240, 41 FR 54180, Dec. 13, 1976]

§ 157.23 Cargo and ballast system information.

(a) Each tank vessel to which this part applies must have an instruction manual that describes the automatic and manual operation of the cargo and ballast system in the vessel.

(b) The format and information contained in the instruction manual required in paragraph (a) of this section must be similar to the manual entitled "Clean Seas Guide for Oil Tankers" which can be obtained from the International Chamber of Shipping, 30-32 St. Mary Axe, London, England, EC3A 8ET.

§ 157.24 Submission of calculations, plans, and specifications.

The owner, builder or designer of a new vessel to which this part applies shall submit the documentation specified in this section to the Coast Guard before that vessel enters the navigable

waters of the United States. The owner, builder, or designer of a vessel that must comply with §157.10d shall submit the documentation specified in this section to the Coast Guard before that vessel enters the navigable waters of the United States or the U.S. Exclusive Economic Zone.

(a) Calculations to substantiate compliance with the tank arrangement and size requirements under §157.19, or a letter from the government of the vessel's flag state that certifies compliance with:

(1) Section 157.19; or

(2) Regulations 24 of Annex I of the International Convention for the Prevention of Pollution from Ships, 1973.

(b) Except for a new vessel that is a foreign vessel, calculations to substantiate compliance with subdivisions and damage stability requirements under §157.21.

(c) Plans and calculations to substantiate compliance with the applicable segregated ballast and double hull requirements in §§157.09, 157.10, 157.10a, 157.10b, or 157.10d, or certification from the government of the vessel's flag state that the vessel complies with the segregated ballast and double hull requirements in:

(1) Sections 157.09, 157.10, 157.10a, 157.10b, or 157.10d, as applicable; or

(2) For a vessel to which §157.10d does not apply, Regulations 13 and 13E of the MARPOL Protocol.

(d) Plans and specifications for the vessel that include:

(1) Design characteristics;

(2) A lines plan;

(3) Curves of form (hydrostatic curves) or hydrostatic tables;

(4) A general arrangement plan of each deck and level;

(5) Inboard and outboard profile plans showing oiltight and watertight bulkheads;

(6) A midship section plan;

(7) A capacity plan showing the capacity and the vertical and longitudinal centers of gravity of each cargo space, tank, and similar space;

(8) Tank sounding tables or tank capacity tables;

(9) Draft mark locations;

(10) Detailed plans of watertight doors; and

(11) Detailed plans of vents.

[CGD 75-240, 41 FR 54180, Dec. 13, 1976, as amended by CGD 77-058b, 45 FR 43708, June 30, 1980; CGD 79-152, 45 FR 82250, Dec. 15, 1980; CGD 90-051, 57 FR 36244, Aug. 12, 1992]

§ 157.24a Submission of calculations, plans, and specifications for existing vessels installing segregated ballast tanks.

(a) Before modifications are made to a U.S. tank vessel to meet §157.10a(a)(1), §157.10a(c)(1), §157.10c(b)(1), or §157.10c(c)(1), the vessel's owner or operator must submit the following to the Officer in Charge, Marine Inspection, of the zone where the modification will be made or to the appropriate Coast Guard technical office listed in 157.100(b):

(1) A drawing or diagram of the pumping and piping system for the segregated ballast tanks.

(2) A drawing of the segregated ballast tank arrangement.

(3) Documentation, calculations, or revised stability information to show that the vessel, with the addition of the segregated ballast tanks, meets the stability standards for load line assignment in 46 CFR Part 42.

(4) Documentation, calculations, or a revised loading manual to show that the vessel, with the addition of the segregated ballast tanks, meets the structural standards in 46 CFR Part 32.

(5) Plans and calculations to show that the vessel, as modified, complies with the segregated ballast capacity and distribution requirements in §157.10a.

(b) Before each foreign vessel under §157.10a(a)(1) or §157.10a(c)(1) enters the navigable waters of the United States, the owner or operator of that vessel must—

(1) Submit to the Commandant (G-MOC), U.S. Coast Guard, Washington, D.C. 20593-0001—

(i) A letter from the authority that assigns the load line to the vessel finding that the location of the segregated ballast tanks is acceptable; and

(ii) Plans and calculations to substantiate compliance with the segregated ballast capacity requirements in §157.09(b); or

(2) Submit to the Officer in Charge, Marine Inspection, of the zone in which