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trunk is within 5 feet (1.5 meters) of the hull.

§ 174.070 General damage stability assumptions.

For the purpose of determining compliance with §174.065, the assumptions are made that during flooding and the resulting change in the unit's waterline—

(a) The unit is not anchored or moored; and

(b) No compartment on the unit is ballasted or pumped out to compensate for the flooding described in §§174.075 through 174.085.

§ 174.075 Compartments assumed flooded: general.

The individual flooding of each of the compartments described in §§174.080 and 174.085 must be assumed for the purpose of determining compliance with §174.065 (a). Simultaneous flooding of more than one compartment must be assumed only when indicated in §§174.080 and 174.085.

§ 174.080 Flooding on self-elevating and surface type units.

(a) On a surface type unit or self-elevating unit, all compartments within 5 feet (1.5 meters) of the hull of the unit between two adjacent main watertight bulkheads, the bottom shell, and the uppermost continuous deck or first superstructure deck where superstructures are fitted must be assumed to be subject to simultaneous flooding.

(b) On the mat of a self-elevating unit, all compartments of the mat must be assumed to be subject to individual flooding.

§ 174.085 Flooding on column stabilized units.

(a) Watertight compartments that are outboard of, or traversed by, a plane which connects the vertical centerlines of the columns on the periphery of the unit, and within 5 feet (1.5 meters) of an outer surface of a column or footing on the periphery of the unit, must be assumed to be subject to flooding as follows:

(1) When a column is subdivided into watertight compartments by horizontal watertight flats, all compartments in the column within 5 feet (1.5

meters) of the unit's waterline before damage causing flooding must be assumed to be subject to simultaneous flooding.

(2) When a column is subdivided into watertight compartments by vertical watertight bulkheads, each two adjacent compartments must be assumed subject to simultaneous flooding if the distance between the vertical watertight bulkheads, measured at the column periphery, is equal to or less than one-eighth of the column perimeter at the draft under consideration.

(3) When a column is subdivided into watertight compartments by horizontal watertight flats and vertical watertight bulkheads, those compartments that are within the bounds described in paragraph (a)(2) of this section and within 5 feet (1.5 meters) of the unit's waterline before damage causing flooding must be assumed to be subject to simultaneous flooding.

(b) Each compartment in a footing must be assumed to be subject to individual flooding when any part of the compartment is within 5 feet (1.5 meters) of the unit's waterline before damage causing flooding.

§ 174.090 Permeability of spaces.

When doing the calculations required in §174.065—

(a) The permeability of a floodable space, other than a machinery space, must be as listed in Table 174.090; and

(b) Calculations in which a machinery space is treated as a floodable space must be based on an assumed machinery space permeability of 85%, unless the use of an assumed permeability of less than 85% is justified in detail.

TABLE 174.090—PERMEABILITY

Spaces and tanks	Permeability (percent)
Storeroom spaces	60.
Accommodation spaces	95.
Voids	95.
Consumable liquid tanks	95 or 0. ¹
Other liquid tanks	95 or 0. ²

¹ Whichever results in the more disabling condition.

² If tanks are partially filled, the permeability must be determined from the actual density and amount of liquid carried.

§ 174.100 Appliances for watertight and weathertight integrity.

(a) Appliances to insure watertight integrity include watertight doors,

hatches, scuttles, bolted manhole covers, or other watertight closures for openings in watertight decks and bulkheads.

(b) Appliances to insure weathertight integrity include weathertight doors and hatches, closures for air pipes, ventilators, ventilation intakes and outlets, and closures for other openings in deckhouses and superstructures.

(c) Each internal opening equipped with appliances to insure watertight integrity that is used intermittently during operation of the unit while afloat must meet the following:

(1) Each door, hatch, and scuttle must—

(i) Be remotely controlled from a normally manned control station, and be operable locally from both sides of the bulkhead; or

(ii) If there is no means of remote control there must be an alarm system that signals whether the appliance is open or closed both locally at each appliance and in a normally manned control station.

(2) Each closing appliance must remain watertight under the design water pressure of the watertight boundary of which it is a part.

(d) Each external opening fitted with an appliance to insure weathertight integrity must be located so that it would not be submerged below the final equilibrium waterline if the unit is subjected simultaneously to—

(1) Damage causing flooding described in §§ 174.075 through 174.085; and

(2) A wind heeling moment calculated in accordance with § 174.055 using a wind velocity of 50 knots (25.8 meters per second).

(e) If a unit is equipped with sliding watertight doors, each sliding watertight door must—

(1) Be designed, constructed, tested, and marked in accordance with ASTM F 1196 (incorporated by reference, see § 174.007);

(2) Have controls in accordance with ASTM F 1197 (incorporated by reference, see § 174.007), except that a remote manual means of closure, as specified in paragraphs 7.1 and 7.5.1, and a remote mechanical indicator, as specified in paragraph 7.5.2, will not be required; and

(3) If installed in a subdivision bulkhead, meet Supplemental Requirements Nos. S1 and S3 of ASTM F 1196 (incorporated by reference, see § 174.007), unless the watertight doors are built in accordance with plans previously approved by the Coast Guard, in which case, only Supplemental Requirements Nos. S1 and S3.1.4 of ASTM F 1196 (incorporated by reference, see § 174.007) must be met. In either case, control systems for watertight doors must have power supplies, power sources, installation tests and inspection, and additional remote operating consoles in accordance with Supplemental Requirements Nos. S1 through S4 of ASTM F 1197 (incorporated by reference, see § 174.007).

(f) Installations of sliding watertight door assemblies must be in accordance with the following:

(1) Before a sliding watertight door assembly is installed in a vessel, the bulkhead in the vicinity of the door opening must be stiffened. Such bulkhead stiffeners, or deck reinforcement where flush deck door openings are desired, must not be less than 6 inches nor more than 12 inches from the door frame so that an unstiffened diaphragm of bulkhead plating 6 to 12 inches wide is provided completely around the door frame. Where such limits cannot be maintained, alternative installations will be considered by the Marine Safety Center. In determining the scantlings of these bulkhead stiffeners, the door frame should not be considered as contributing to the strength of the bulkhead. Provision must also be made to adequately support the thrust bearings and other equipment that may be mounted on the bulkhead or deck.

(2) Sliding watertight door frames must be either bolted or welded watertight to the bulkhead.

(i) If bolted, a suitable thin heat and fire resistant gasket or suitable compound must be used between the bulkhead and the frame for watertightness. The bulkhead plating shall be worked to a plane surface in way of the frame when mounting.

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(ii) If welded, caution must be exercised in the welding process so that the door frame is not distorted.

[CGD 79-023, 48 FR 51048, Nov. 4, 1983, as amended by CGD 88-032, 56 FR 35828, July 29, 1991; USCG-2000-7790, 65 FR 58464, Sept. 29, 2000]

Subpart D [Reserved]

Subpart E—Special Rules Pertaining to Tugboats and Towboats

§ 174.140 Specific applicability.

Each tugboat and towboat inspected under subchapter I of this chapter must comply with this subpart.

§ 174.145 Intact stability requirements.

(a) In each condition of loading and operation, each vessel must be shown by design calculations to meet the requirements of paragraphs (b) through (e) of this section.

(b) The area under each righting arm curve must be at least 16.9 foot-degrees (5.15 meter-degrees) up to the smallest of the following angles:

(1) The angle of maximum righting arm.

(2) The downflooding angle.

(3) 40 degrees.

(c) The area under each righting arm curve must be at least 5.6 foot-degrees (1.72 meter-degrees) between the angles of 30 degrees and 40 degrees, or between 30 degrees and the downflooding angle if this angle is less than 40 degrees.

(d) The maximum righting arm shall occur at a heel of at least 25 degrees.

(e) The righting arm curve must be positive to at least 60 degrees.

(f) For the purpose of this section, at each angle of heel, a vessel's righting arm may be calculated considering either—

(1) The vessel is permitted to trim free until the trimming moment is zero; or

(2) The vessel does not trim as it heels.

Subpart F [Reserved]

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Subpart G—Special Rules Pertaining to Offshore Supply Vessels

SOURCE: CGD 82-004 and CGD 86-074, 62 FR 49353, Sept. 19, 1997, unless otherwise noted.

§ 174.180 Applicability.

Each offshore supply vessel (OSV), except a liftboat inspected under subchapter L of this chapter, must comply with this subpart.

§ 174.185 Intact stability.

(a) Each OSV must be shown by design calculations to meet, under each condition of loading and operation, the minimal requirements for metacentric height (GM) in §170.170 of this chapter, and in either §170.173 of this chapter or paragraphs (b) through (e) of this section.

(b) The area under each righting arm curve must be at least 0.08 meter-radians (15 foot-degrees) up to the smallest of the following angles:

(1) The angle of maximum righting arm;

(2) The downflooding angle; or

(3) 40 degrees.

(c) The downflooding angle must not be less than 20 degrees.

(d) The righting arm curve must be positive to at least 40 degrees.

(e) The freeboard at the stern must be equal to the freeboard calculated to comply with subchapter E of this chapter or to the value taken from Table 174.185, whichever is less.

(f) For paragraphs (b) and (d) of this section, at each angle of heel an OSV's righting arm may be calculated considering either—

(1) The vessel is permitted to trim free until the trimming moment is zero; or

(2) The vessel does not trim as it heels.

(g) For the purpose of paragraphs (b) and (d) of this section, the method of calculating righting arms chosen must be the same for all calculations.