deck house, must be capable of withstanding the maximum load from wave and wind conditions expected due to its location on the vessel and the authorized route of the vessel.

§ 177.1030 Operating station visibility.

(a) Windows and other openings at the operating station must be of sufficient size and properly located to provide an adequate view for safe navigation in all operating conditions.

(b) Glass or other glazing material used in windows at the operating station must have a light transmission of not less than 70 percent according to Test 2 of American National Standards Institute (ANSI) Z 26.1 ''Safety Glazing Materials For Motor Vehicles Operating on Land Highways,'' and must comply with Test 15 of ANSI Z 26.1 for Class I Optical Deviation.

PART 178—INTACT STABILITY AND SEAWORTHINESS

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178.325 Intact stability requirements for a sailing vessel.
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178.510 Ballast.

AUTHORITY: 43 U.S.C. 1333; 46 U.S.C. 2103, 3306, 3703; E.O. 12234, 45 FR 58801, 3 CFR, 1980 Comp., p. 277; Department of Homeland Security Delegation No. 0170.1.

SOURCE: CGD 85–080, 61 FR 966, Jan. 10, 1996, unless otherwise noted.

Subpart A—General Provisions

§ 178.115 Applicability to existing vessels.

An existing vessel must comply with the intact stability and seaworthiness regulations which were applicable to the vessel on March 10, 1996, or, as an alternative, the vessel may comply with the regulations in this part.

Subpart B—Stability Instructions for Operating Personnel

§ 178.210 Stability information.

(a) Stability information (stability details indicated on the Certificate of Inspection, a stability letter, or a stability booklet) is required on certain vessels by paragraphs (b) or (c) of this section. Enough stability information, including stability calculations and assumptions made to use them, must be provided to allow the master to be able to determine operating guidelines, loading restrictions, and ensure compliance with the applicable intact and damage stability regulations of this chapter.

(b) A vessel which, under §178.310, must comply with requirements in subchapter S of this chapter, must have stability details on the vessel's Certificate of Inspection, a stability letter issued by the cognizant Officer in Charge, Marine Inspection (OCMI) or the Commanding Officer, Marine Safety Center, or an approved stability booklet. The form in which the stability information must be contained (i.e., stability details on the Certificate of Inspection, a stability letter, or a stability booklet) will be determined by the Commanding Officer, Marine Safety Center.

(c) When necessary for safe operation, the cognizant OCMI may place specific stability restrictions in a stability letter or on the Certificate of Inspection of a vessel of not more than 19.8 meters (65 feet) in length, which, under §178.310 of this part, must comply with the requirements of §178.320 of this part.

§ 178.220 Stability booklet.

When the Commanding Officer, Marine Safety Center determines, in accordance with § 178.210(b), that a vessel must have a stability booklet, the owner or operator must prepare the booklet in accordance with subchapter S of this chapter, and submit it to the Commanding Officer, Marine Safety Center.

§ 178.230 Stability letter or Certificate of Inspection stability details.

(a) When the cognizant OCMI or the Commanding Officer, Marine Safety Center determines, in accordance with § 178.210, that a vessel must have stability details indicated on its Certificate of Inspection or a stability letter, the owner or operator must submit the information listed in paragraph (b) of this section:

(1) If § 178.210(c) is applicable, to the OCMI for approval; or

(2) If § 178.210(b) is applicable, to the Commanding Officer, Marine Safety Center for approval.

(b) The following applicable information, and the necessary calculations used to determine that information, must be submitted as required by paragraph (a) of this section:

(1) Allowable number of passengers and crew on each deck;

(2) Deepest waterline drafts or freeboard;

(3) Location of watertight bulkheads and openings in watertight bulkheads;

(4) Explanation of the vessel's subdivision and specific identification of the vessel's subdivision bulkheads;

(5) Location of openings through watertight bulkheads, such as watertight doors, which must be closed to limit flooding in an emergency;

(6) Location, type and amount of fixed ballast;

(7) Location and details of foam flotation material; and

(8) Maximum weight of portable equipment permitted on the vessel including diving equipment.

Subpart C—Intact Stability Standards

§ 178.310 Applicability based on length and passenger capacity.

(a) A vessel of not more than 19.8 meters (65 feet) in length must meet the applicable requirements of § 178.320 or 178.325, or of §§ 170.170, 170.173, and 171.050 in subchapter S of this chapter, if:

(1) Carrying not more than 150 passengers on a domestic voyage;

(2) Carrying not more than 12 passengers on an international voyage; or

(3) It has not more than one deck above the bulkhead deck, exclusive of a pilot house.

(b) The following vessels must meet the appropriate requirements of §§ 170.170, 170.173, 171.050, 171.055, and 171.057 in subchapter S of this chapter;

(1) A vessel of more than 19.8 meters (65 feet) in length;

(2) A vessel carrying more than 12 passengers on an international voyage; and

(3) A vessel with more than 1 deck above the bulkhead deck exclusive of a pilot house.

[CGD 85–080, 61 FR 966, Jan. 10, 1996, as amended at 62 FR 51356, Sept. 30, 1997]

§ 178.320 Intact stability requirements.

(a) A vessel, except a pontoon vessel operating on protected waters, must undergo a simplified stability proof test in accordance with § 178.330 of this part in the presence of a Coast Guard marine inspector.

(b) A pontoon vessel operating on protected waters must undergo a simplified stability proof test in accordance with § 178.340 of this part in the presence of a Coast Guard marine inspector.

(c) The cognizant OCMI may dispense with the simplified stability proof test in § 178.330 for a vessel carrying not more than 49 passengers where it can be established that, due to the form, arrangement, construction, number of decks, route, and operating restrictions of the vessel, the vessel's stability can be safely determined without such a test. Vessels which carry deck cargo must undergo a simplified stability proof test.

(d) A vessel whose stability is questioned by the cognizant OCMI must be shown by design calculations to meet the applicable stability criteria of §§ 170.170, 170.173, and 171.050 in subchapter S of this chapter in each condition of loading and operation.

(e) A simplified stability proof test in accordance with § 178.330 is conducted to determine if a vessel, as built and operated, has a minimum level of initial stability. Failure of the simplified test does not necessarily mean that the vessel lacks stability for the intended route, service, and operating condition, but that calculations or other methods must be used to evaluate the stability of the vessel.

[CGD 85–080, 61 FR 966, Jan. 10, 1996; 61 FR 20557, May 7, 1996]

§ 178.325 Intact stability requirements for a sailing vessel.

(a) Except as provided in paragraphs (b), (c) and (e) of this section, each sailing vessel must undergo a simplified stability proof test in accordance with § 178.330 of this part in the presence of a Coast Guard marine inspector.

(b) Each of the following sailing vessels must meet the intact stability standards of §§ 170.170 and 171.055 in subchapter S of this chapter:

(1) A vessel to be operated on exposed waters;

(2) A vessel to be operated during non-daylight hours;

(3) A vessel of unusual type, rig, or hull form, including vessels without a weathertight deck, such as open boats;

(4) A vessel that carries more than 49 passengers;

(5) A sailing school vessel that carries a combined total of six or more sailing school students or instructors;

(6) A vessel on which downflooding occurs at angles of 60° or less; and

(7) A vessel which has a cockpit longer than Length Over Deck (LOD)/5.

(c) A catamaran must meet the intact stability requirements of § 171.057 in subchapter S of this chapter while under sail as well as the intact stability requirements of § 170.170 in subchapter S of this chapter or § 178.320 under barepoles (if an auxiliary sailing vessel) and with storm sails set and trimmed flat (if a sailing vessel).

(d) A sailing vessel that is not listed in paragraph (b) or (c) of this section and operates on partially protected waters must be equipped with a self-bailing cockpit.

(e) The cognizant OCMI may perform operational tests to determine whether the vessel has adequate stability and satisfactory handling characteristics under sail for protected waters or partially protected waters, in lieu of conducting a simplified stability proof test.

(f) Commanding Officer, Marine Safety Center, may prescribe additional or different stability requirements for a broad, shallow draft vessel with little or no ballast outside the hull.

§ 178.330 Simplified stability proof test.

(a) A vessel must be in the condition specified in this paragraph when a simplified stability proof test is performed.

(1) The construction of the vessel must be complete in all respects.

(2) Ballast, if necessary, must be in compliance with § 178.510 and must be on board and in place.

(3) Each fuel and water tank must be approximately three-quarters full.

(4) A weight equal to the total weight of all passengers, crew, and other loads permitted on the vessel must be on board and distributed so as to provide normal operating trim and to simulate the vertical center of gravity causing the least stable condition that is likely to occur in service. Unless otherwise specified, weight and vertical center of gravity is assumed to be as follows:

(i) The weight of primary lifesaving equipment should be simulated at its normal location, if not on board at the time of the test;

(ii) The weight of one person is considered to be 72.6 kilograms (160 pounds) except the weight of one person is considered to be 63.5 kilograms (140 pounds) if the vessel operates exclusively on protected waters and the passenger load consists of men, women, and children;

(iii) The vertical center for the simulated weight of passengers, crew, and other loads must be at least 760 millimeters (2.5 feet) above the deck; and

(iv) If the vessel carries passengers on diving excursions, the total weight of diving gear must be included in the loaded condition as follows:

(A) The total weight of individual diving gear for each passenger carried is assumed to be 36 kilograms (80 pounds), which includes the weight of scuba tanks, harness, regulator, weight belt, wet suit, mask, and other personal diving equipment; and

(B) The weight of any air compressors carried.

(v) On vessels having one upper deck above the main deck available to passengers, the weight distribution must not be less severe than the following:

Total Test Weight (W) = ____
Passenger Capacity of Upper Deck: ____
Weight on Upper Deck = (# of Passengers on Upper Deck) × (Wt per Passenger) × 1.33''
Weight on Main Deck = Total Test Weight − Weight on Upper Deck

(5) All non-return closures on cockpit scuppers or on weather deck drains must be kept open during the test.

(b) A vessel must not exceed the limitations in paragraph (f) of this section, when subjected to the greater of the following heeling moments:

$M_p = (W)\ (B_p)/6$; or
$M_w = (P)\ (A)\ (H)$

where:

M_p = passenger heeling moment in kilogram-meters (foot-pounds);
W = the total passenger weight using 72.6 kilograms (160 pounds) per passenger, or, if the vessel operates exclusively on protected waters and the passenger load consists of men, women, and children, 63.5 kilograms (140 pounds) per passenger may be used;
B_p = the maximum transverse distance in meters (feet) of a deck that is accessible to passengers;
M_w = wind heeling moment in kilogram-meters (foot-pounds);
P = wind pressure of:
(1) 36.6 kilograms/square meter (7.5 pounds/square foot) for operation on protected waters;
(2) 48.8 kilogram/square meter (10.0 pounds/square foot) for operation on partially protected waters; or
(3) 73.3 kilograms/square meter (15.0 pounds/square foot) for operation on exposed waters;
A = area, in square meters (square feet), of the projected lateral surface of the vessel above the waterline (including each projected area of the hull, superstructure and area bounded by railings and structural canopies). For sailing vessels this is the bare poles area, or, if the vessel has no auxiliary power, with storm sails set; and
H = height, in meters (feet), of the center of area (A) above the waterline, measured up from the waterline.

(c) For sailing vessels the heeling moment used for this test must be the greater of the following:

(1) Passenger heeling moment from paragraph (b) of this section.

(2) Wind heeling moment from paragraph (b) of this section.

(3) Wind heeling moment calculated from the wind heeling moment equation in paragraph (b) of this section, where:

M_w = wind heeling moment in kilogram-meters (foot-pounds);
P=4.9 kilograms/square meter (1.0 pounds/square foot) for both protected and partially protected waters.
A=the windage area of the vessel in square meters (square feet) with all sails set and trimmed flat;
H=height, in meters (feet), of the center of effort of area (A) above the waterline, measured up from the waterline; and

(d) A vessel must not exceed the following limits of heel:

(1) On a flush deck vessel, not more than one-half of the freeboard may be immersed.

(2) On a well deck vessel, not more than one-half of the freeboard may be immersed, except that, on a well deck vessel that operates on protected waters and has non-return scuppers or freeing ports, the full freeboard may be immersed if the full freeboard is not more than one-quarter of the distance from the waterline to the gunwale.

(3) On a cockpit vessel, the maximum allowable immersion is calculated from the following equation:

(i) On exposed waters—

$i = f(2L - 1.5L')/4L$

(ii) On protected or partially protected waters—

$i = f(2L - L')/4L$

where:

i=maximum allowable immersion in meters (feet);
f=freeboard in meters (feet);
L=length of the weather deck, in meters (feet); and
L′=length of cockpit in meters (feet).

(4) On an open boat, not more than one quarter of the freeboard may be immersed.

(5) On a flush deck sailing vessel, the full freeboard may be immersed.

(6) In no case may the angle of heel exceed 14 degrees.

(e) The limits of heel must be measured at:

(1) The point of minimum freeboard; or

(2) At a point three-quarters of the vessel's length from the bow if the point of minimum freeboard is aft of this point.

(f) When demonstrating compliance with paragraph (d) of this section, the freeboard must be measured as follows:

(1) For a flush deck or well deck vessel, the freeboard must be measured to the top of the weatherdeck at the side of the vessel; and

(2) For a cockpit vessel or for an open boat, the freeboard must be measured to the top of the gunwale.

(g) A ferry must also be tested in a manner acceptable to the cognizant OCMI to determine whether the trim or heel during loading or unloading will submerge the deck edge. A ferry passes this test if, with the total number of passengers and the maximum vehicle weight permitted on board, the deck edge is not submerged during loading or unloading of the vessel.

[CGD 85–080, 61 FR 966, Jan. 10, 1996; 61 FR 20557, May 7, 1996, as amended at 62 FR 51356, Sept. 30, 1997; 62 FR 64306, Dec. 5, 1997]

§ 178.340 Stability standards for pontoon vessels on protected waters.

(a) The portion of the deck accessible to passengers on a pontoon vessel must not extend beyond the outboard edge of either pontoon, nor beyond the forward or aft ends of the pontoons.

(b) A pontoon vessel that has more than 2 pontoons or has decks higher than 150 milimeters (6 inches) above the pontoons must meet a stability standard acceptable to the Commanding Officer, Marine Safety Center.

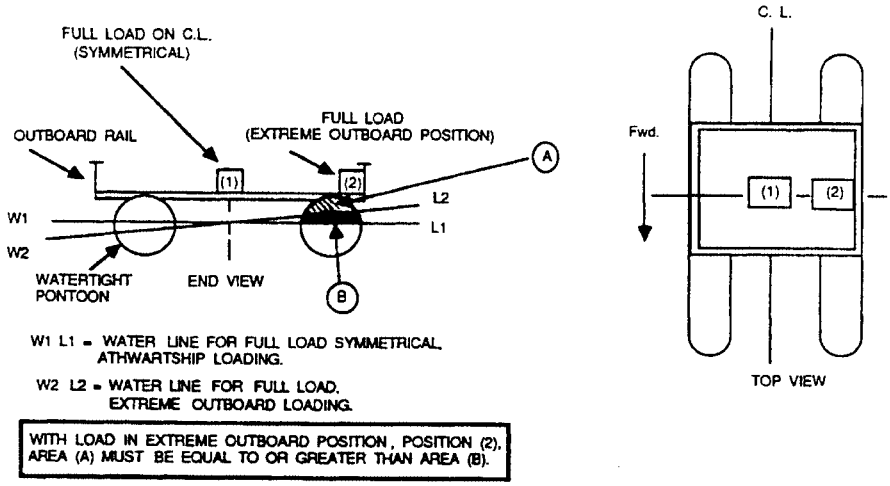
(c) A pontoon vessel must be in the condition described in §178.330(a) of this part when the simplified stability proof test is performed, except that the simulated load of passengers, crew, and other weights is initially centered on the vessel so that trim and heel are minimized.

(d) A pontoon vessel has the minimum acceptable level of initial stability if it meets the following:

(1) With the simulated load located at the extreme outboard position of the deck on the side with the least initial freeboard, the remaining exposed cross sectional area of the pontoon on that side must be equal to or greater than the cross sectional area submerged due to the load shift, as indicated in Figure 178.340(d)(1); and

FIGURE 178.340(d)(1)

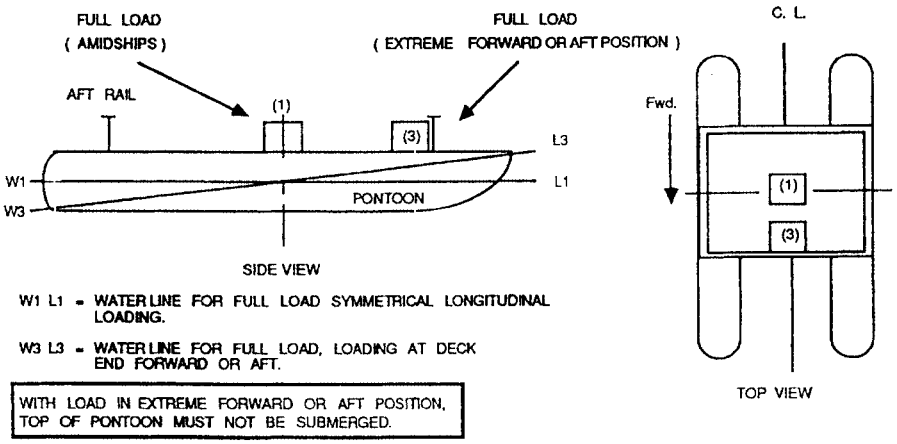
TRANSVERSE STABILITY STANDARD



(2) With the simulated load located on the centerline at the extreme fore or aft end of the deck, whichever position is further from the initial position of the load, the top of the pontoon must not be submerged at any location, as indicated in Figure 178.340(d)(2).

FIGURE 178.340(d)(2)

LONGITUDINAL STABILITY STANDARD



[CGD 85–080, 61 FR 966, Jan. 10, 1996, as amended by CGD 97–057, 62 FR 51050, Sept. 30, 1997]

Subpart D—Drainage of Weather Decks

§ 178.410 Drainage of flush deck vessels.

(a) Except as provided in paragraph (b) of this section, the weather deck on a flush deck vessel must be watertight and have no obstruction to overboard drainage.

(b) Each flush deck vessel may have solid bulwarks in the forward one-third length of the vessel if:

(1) The bulwarks do not form a well enclosed on all sides; and

(2) The foredeck of the vessel has sufficient sheer to ensure drainage aft.

[CGD 85–080, 61 FR 966, Jan. 10, 1996, as amended at 62 FR 51357, Sept. 30, 1997]

§ 178.420 Drainage of cockpit vessels.

(a) Except as follows, the cockpit on a cockpit vessel may be watertight:

(1) A cockpit may have companionways if the companionway openings have watertight doors, or weathertight doors and coamings which meet § 179.360 of this subchapter.

(2) A cockpit may have ventilation openings along its inner periphery if the vessel operates only on protected or partially protected waters.

(b) The cockpit deck of a cockpit vessel that operates on exposed or partially protected waters must be at least 255 millimeters (10 inches) above the deepest load waterline unless the vessel complies with:

(1) The intact stability requirements of §§ 170.170, 170.173, 171.050, 171.055, and 171.057 in subchapter S of this chapter;

(2) The Type II subdivision requirements in §§ 171.070, 171.072, and 171.073 in subchapter S of this chapter; and

(3) The damage stability requirements in § 171.080 in subchapter S of this chapter.

(c) The cockpit deck of a cockpit vessel that does not operate on exposed or partially protected waters must be located as high above the deepest load waterline as practicable.

(d) The cockpit must be self-bailing. Scuppers or freeing ports for the cockpit deck of a cockpit vessel must:

(1) Be located to allow rapid clearing of water in all probable conditions of list and trim;

(2) Have a combined drainage area of at least the area required by § 178.450 of this part; and

(3) If the deck is less than 255 millimeters (10 inches) above the deepest load waterline of the vessel, be fitted with non-return devices.

§ 178.430 Drainage of well deck vessels.

(a) The weather deck on a well deck vessel must be watertight.

(b) The area required on a well deck vessel for drainage of well formed by the bulwarks shall be determined by § 178.450.

(c) The freeing ports or scuppers on a well deck vessel must be located to allow rapid clearing of water in all probable conditions of list and trim.

(d) The deck of well deck vessel that operates on exposed or partially protected waters must be at least 255 millimeters (10 inches) above the deepest load waterline unless the vessel complies with:

(1) The intact stability requirements of §§ 170.170, 170.173, 171.050, 171.055, and 171.057 in subchapter S of this chapter;

(2) The Type II subdivision requirements in §§ 171.070, 171.072, and 171.073 in subchapter S of this chapter; and

(3) The damage stability requirements in § 171.080 in subchapter S of this chapter.

§ 178.440 Drainage of open boats.

The deck within the hull of an open boat must drain to the bilge. Overboard drainage of the deck is not permitted.

§ 178.450 Calculation of drainage area for cockpit and well deck vessels.

(a) The drainage area required on a vessel must be computed using the following formula:

For protected waters required drainage = .1 × Basic Drainage

For partially protected waters required drainage = .5 × Basis Drainage

For exposed waters required drainage = Basic Drainage

where:

Basic Drainage area in centimeters^2 = 4389.12 × [(Recess Volume × Recess Ratio) + (Weather Deck Volume × Weather Deck Ratio)]; or

Basic Drainage area in inch^2 = (Recess Volume × Recess Ratio) + (Weather Deck Volume × Weather Deck Ratio)

$$\text{Recess Volume} = (B_R \times D_R) - V_R$$

B_R=average height in centimeters (feet) of the bulwark above the well deck or cockpit deck;

D_R=total deck area of the cockpit or well deck in the after ⅔ of the vessel length (LOD) measured in centimeters^2 (feet^2).

V_R=volume of any weather tight structure below the bulwark of the well deck or cockpit deck.

$$\text{Recess Ratio} = L_R / L_C$$

L_R=the length of the recess in the after ⅔ vessel length (LOD).

L_C=⅔ vessel length (LOD).

$$\text{Weather Deck Volume} = (B_D \times D_D) - V_S$$

B_D=average height in centimeters (feet) of the bulwark above the weather deck;

D_D=total deck area of the weather deck adjacent to bulwarks but not in way of the cockpit or well deck in the after ⅔ of the vessel length (LOD) measured in centimenters^2 (feet^2).

V_S=volume of any weather tight superstructure below the bulwark on the weather deck located within D_D.

$$\text{Weather Deck Ratio} = L_D / L_C$$

L_D=the length of the weather deck bulwark in the after ⅔ of the vessel length (LOD).

L_C=⅔ vessel length (LOD).

(b) Vessels with bulwarks in the forward part of the vessel shall not form a well with the deckhouse which retains water.

[CGD 85–080, 61 FR 966, Jan. 10, 1996; 61 FR 20557, May 7, 1996]

Subpart E—Special Installations

§ 178.510 Ballast.

(a) Any solid fixed ballast used to comply with the requirements of parts 170, 171, 178, and 179 of this chapter must be:

(1) Stowed in a manner that prevents shifting of the ballast; and

(2) Installed to the satisfaction of the cognizant OCMI.

(b) Solid fixed ballast may not be located forward of the collision bulkhead unless the installation and arrangement of the ballast and the collision bulkhead minimizes the risk of the ballast penetrating the bulkhead in a collision.

(c) Solid fixed ballast may not be removed from a vessel or relocated unless approved by the cognizant OCMI except that ballast may be temporarily moved for a vessel examination or repair if it is replaced to the satisfaction of the OCMI.

(d) Water ballast, either as an active system or permanent, must be approved by the Commanding Officer, Marine Safety Center.

PART 179—SUBDIVISION, DAMAGE STABILITY, AND WATERTIGHT INTEGRITY

Subpart A—General Provisions

Sec.

Subpart B—Subdivision and Damage Stability Requirements

Subpart C—Watertight Integrity Requirements

AUTHORITY: 43 U.S.C. 1333; 46 U.S.C. 2103, 3306, 3703; E.O. 12234, 45 FR 58801, 3 CFR, 1980 Comp., p. 277; Department of Homeland Security Delegation No. 0170.1.

SOURCE: CGD 85–080, 61 FR 971, Jan. 10, 1996, unless otherwise noted.

Subpart A—General Provisions

§ 179.115 Applicability to existing vessels.

An existing vessel must comply with the subdivision, damage stability, and watertight integrity regulations which were applicable to the vessel on March 10, 1996, or, as an alternative, the vessel may comply with the regulations in this part.

Subpart B—Subdivision and Damage Stability Requirements

§ 179.210 Collision bulkhead.

(a) A vessel of more than 19.8 meters (65 feet) in length must have a collision bulkhead.

(b) A vessel of not more than 19.8 meters (65 feet) in length must have a collision bulkhead if it:

(1) Carries more than 49 passengers;

(2) Operates on exposed waters;

(3) Is of more than 12.2 meters (40 feet) in length and operates on partially protected waters; or

(4) Is constructed of wood on or after March 11, 2001, and operates in cold water.

(c) A double-ended ferry required to have a collision bulkhead must have a collision bulkhead at each end of the vessel.

§ 179.212 Watertight bulkheads for subdivision.

(a) A vessel of not more than 19.8 meters (65 feet) in length must comply with § 179.220 of this part if it:

(1) Carries more than 49 passengers; or

(2) Is constructed of wood on or after March 11, 2001, and operates in cold water.

As an alternative, the above vessels may comply with the intact stability requirements of §§ 170.170, 170.173, 171.050 and 171.055 of this chapter, and comply with the Type II subdivision requirements of §§ 171.070 through 171.073 in subchapter S of this chapter.

(b) A vessel of more than 19.8 meters (65 feet) in length must comply with the Type II subdivision requirements of §§ 171.070 through 171.073 in subchapter S of this chapter.

(c) A vessel that carries more than 12 passengers on an international voyage must meet the Type II subdivision requirements of §§ 171.070 through 171.073 in subchapter S of this chapter.

§ 179.220 Location of watertight bulkheads for subdivision.

(a) The maximum distance between adjacent main transverse watertight bulkheads on a vessel, required by § 179.212(a) of this part to comply with this section, must not be more than the smaller of the following: