§ 170.300 Special consideration for free surface of spoil in hopper dredge hoppers.

The calculations required by this subchapter for each self-propelled hopper dredge must include—

(a) The free surface effect of consumable liquids and the free surface effect of the dredged spoil in the hoppers; and

(b) Either of the following assumptions when performing the calculations required by § 174.310(b) of this chapter:

(1) If the dredged spoil is assumed to be jettisoned, the free surface of the dredged spoil may be disregarded.

(2) If the dredged spoil is not assumed to be jettisoned. the free surface of the dredged spoil must be calculated.

[CGD 76–080, 54 FR 36977, Sept. 6, 1989]

PART 171—SPECIAL RULES PERTAINING TO VESSELS CARRYING PASSENGERS

Subpart A—General

Sec.

Subpart B—Intact Stability

Subpart C—Subdivision and Damage Stability

Subpart D—Additional Subdivision Requirements

Subpart E—Penetrations and Openings in Watertight Bulkheads

Subpart F—Openings in the Side of a Vessel Below the Bulkhead or Weather Deck

Subpart G—Watertight Integrity Above the Margin Line

Subpart H—Drainage of Weather Decks

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

SOURCE: CGD 79–023, 48 FR 51017, Nov. 4, 1983, unless otherwise noted.

Subpart A—General

§ 171.001 Applicability.

(a) Except as provided in paragraph (d) of this section, this part applies to passenger vessels inspected under subchapter K or H of this chapter, or a passenger vessel the stability of which is questioned by the Officer in Charge, Marine Inspection (OCMI).

(b) Specific sections of this part also apply to nautical school ships, sailing school vessels and oceanographic vessels. The applicable sections are listed in subparts C and D of part 173 of this chapter.

(c) Specific sections of this part may also apply to a small passenger vessel inspected under subchapter T of this chapter. The specific sections are listed in subparts B and C of part 178 of this chapter and in subpart B of part 179 of this chapter.

(d) Unless permitted otherwise, a passenger vessel constructed on or after January 1, 2009, and issued a SOLAS Passenger Ship Safety Certificate must meet the applicable requirements of IMO Res. MSC.216(82) (incorporated by reference, see § 171.012), instead of the requirements of this part. For the purposes of this section, the applicable requirements of IMO Res. MSC.216(82) are equivalent to the requirements of this part when applied to such vessels.

[CGD 79–023, 48 FR 51017, Nov. 4, 1983, as amended by CGD 83–005, 51 FR 923, Jan. 9, 1986; CGD 95–012, 60 FR 48052, Sept. 18, 1995; 60 FR 50120, Sept. 28, 1995; CGD 85–080, 61 FR 944, Jan. 10, 1996; USCG–2007–0030, 75 FR 78084, Dec. 14, 2010]

§ 171.010 Definitions.

(a) *Cockpit* means an exposed recess in the weather deck extending no more than one-half of the vessel's length over deck (LOD) measured over the weather deck.

(b) *Deepest subdivision load line* means the waterline that corresponds to the deepest draft permitted by the applicable subdivision requirements in this part.

(c) *Equivalent plane bulkhead* means a bulkhead that is—

(1) Used in lieu of a recessed or stepped bulkhead when doing the subdivision calculations required in this part; and

(2) Located as shown in Figure 171.010(a).

(d) *Ferry* means a vessel that—

(1) Operates in other than ocean or coastwise service;

(2) Has provisions only for deck passengers or vehicles, or both;

(3) Operates on a short run on a frequent schedule between two points over the most direct water route;

(4) Offers a public service of a type normally attributed to a bridge or tunnel.

(e) *Freeing port* means any direct opening through the vessel's bulwark or hull to quickly drain overboard water which has been shipped on exposed decks.

(f) *Floodable length* means the length of a shell to shell segment of the vessel that, when flooded, will sink and trim the vessel until the margin line is tangent to the waterline.

(g) *Flush deck* means a continuous weather deck located at the uppermost sheer line of the hull.

(h) *International voyage* has the same meaning provided for the term in § 70.05–10 of this chapter.

(i) *Machinery space* means, unless otherwise prescribed by the Commandant for unusual arrangements, the space extending from the molded base line to the margin line and between the main transverse watertight bulkheads bounding the following spaces:

(1) Each space containing main and auxiliary propelling machinery.

(2) Each space containing propulsion boilers.

(3) Each space containing permanent coal bunkers.

(j) *Open boat* means a vessel not protected from entry of water by means of a complete deck, or by a combination of a partial weather deck and superstructure which is seaworthy for the waters upon which the vessel operates.

(k) *Passenger space* means a space which is provided for the accommodation and use of passengers, other than a baggage, store, provision or mail room.

(l) *Recessed bulkhead* means a bulkhead that is recessed as shown by bulkhead B in Figure 171.010(b).

(m) *Small passenger vessel* means a vessel of less than 100 gross tons—

(1) Carrying more than 6 passengers, including at least one passenger for hire;

(2) That is chartered with the crew provided or specified by the owner or owner's representative and carrying more than 6 passengers;

(3) That is chartered with no crew provided or specified by the owner or owner's representative and carrying more than 12 passengers; or

(4) That is a submersible vessel carrying at least one passenger for hire.

(n) *Short international voyage* means an international voyage where—

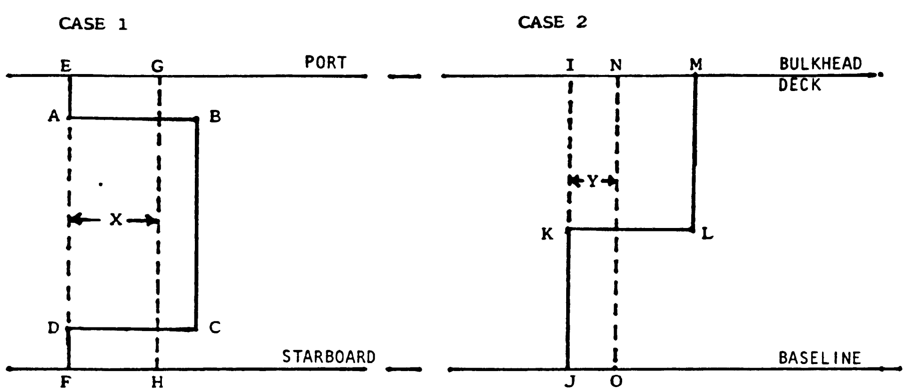
(1) A vessel is not more than 200 nautical miles (370 kilometers) from a port or place in which the passengers and crew could be placed in safety; and

(2) The total distance between the last port of call in the country in which the voyage began and the final port of destination does not exceed 600 nautical miles (1111 kilometers).

(o) *Scupper* means a pipe or tube of at least 30 millimeters (1.25 inches) in diameter leading down from a deck or sole and through the hull to drain water overboard.

(p) *Stepped bulkhead* means a bulkhead that is stepped as shown by bulkhead A in Figure 171.010(b).

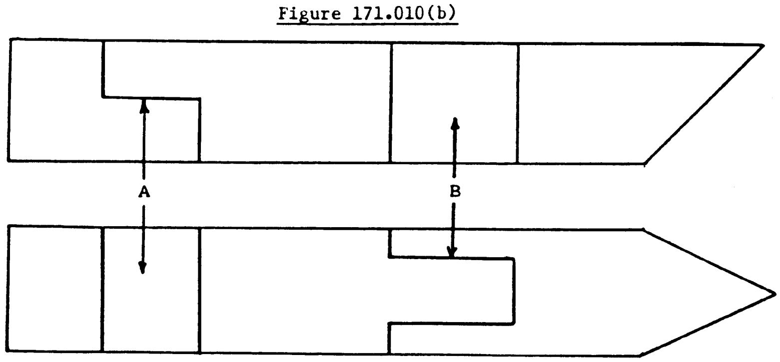
Figure 171.010(a)



Case 1: X = V/A
where–
X = Distance between EF and the equivalent plane bulkhead GH.
V = Volume of the space directly below ABCD and extending to the shell.
A = Sectional area midway between EF and GH.

Case 2: Y = V/A
where–
Y = Distance between IJ and the equivalent plane bulkhead NO.
V = Volume of the space directly below IKLM and extending to the shell.
A = Sectional area midway between IJ and NO.

Figure 171.010(b)



(q) *Well deck* means a weather deck fitted with solid bulwarks that impede the drainage of water over the sides or an exposed recess in the weather deck extending one-half or more of the length of the vessel (LOD) measured over the weather deck.

[CGD 79–023, 48 FR 51017, Nov. 4, 1983, as amended by CGD 85–080, 61 FR 944, Jan. 10, 1996]

§ 171.012 Incorporation by reference.

(a) Certain material is incorporated by reference into this part with the approval of the Director of the Federal Register under 5 U.S.C. 552(a) and 1 CFR part 51. To enforce any edition other than that specified in this section, the Coast Guard must publish a notice of change in the FEDERAL REGISTER and the material must be available to the public. All approved material is available for inspection at the National Archives and Records Administration (NARA). For information on the availability of this material at NARA, call 202–741–6030 or go to *http://www.archives.gov/federal_register/code_of_federal_regulations/ibr_locations.html.* It is also available for inspection at the Coast Guard, Office of Design and Engineering Standards, Naval Architecture Division (CG–5212), 2100 2nd St., SW., Stop 7126, Washington, DC 20593–7126, and is available from the sources listed below.

(b) International Maritime Organization (IMO), Publications Section, 4 Albert Embankment, London SE1 7SR, United Kingdom, +44 (0)20 7735 7611, *http://www.imo.org/.*

(1) Resolution MSC.216(82), Amendments to the International Convention for the Safety of Life At Sea, 1974, As Amended (IMO Res. MSC.216(82), Adopted on 8 December 2006, incorporation by reference (IBR) approved for §§ 171.001 and 171.080.

(2) Resolution MSC 267(85), Adoption of the International Code on Intact Stability, 2008 (2008 IS Code), Adopted on 4 December 2008, IBR approved for § 171.050.

[USCG–2007–0030, 75 FR 78085, Dec. 14, 2010]

§ 171.015 Location of margin line.

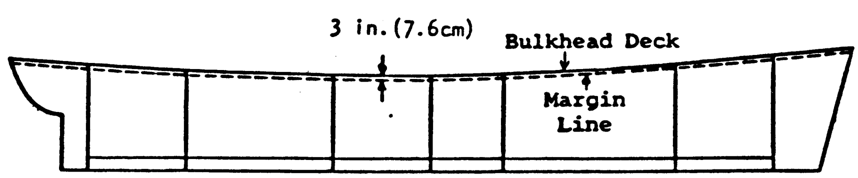
(a) *A vessel with a continuous bulkhead deck and sufficient sheer.* If the average value of the sheer at the forward perpendicular (FP) and the after perpendicular (AP) is at least 12 inches (30.5 cm), the margin line must be located no less than 3 inches (7.6 cm) below the upper surface of the bulkhead deck at side as illustrated in Figure 171.015(a).

TABLE 171.015

Average value of sheer at FP and AP in inches (cm)	Required position of margin line below top of deck amidships in inches (cm)
12 (30.5)	3 (7.6)
6 (15.2)	6 (15.2)
0	9 (22.8)

Figure 171.015(a)

Margin Line for a Vessel With a Continuous Bulkhead Deck and With an Average Value of Sheer at the FP and AP of at Least 12 Inches (30.5 cm)



(b) *A vessel with a continuous bulkhead deck and insufficient sheer.* If the average value of the sheer at the forward perpendicular (FP) and the after perpendicular (AP) is less than 12 inches (30.5 cm), the margin line must be a parabolic curve with the following characteristics:

(1) The parabolic curve must be at least 3 inches (7.6 cm) below the upper surface of the bulkhead deck at the FP and AP.

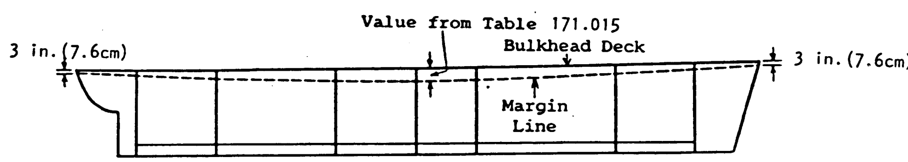
(2) The parabolic curve must be at least the distance given in Table 171.015 below the surface of the bulkhead deck amidships.

(3) Intermediate values not shown in Table 171.015 must be interpolated.

(4) Figure 171.015(b) illustrates a margin line drawn in this manner.

Figure 171.015(b)

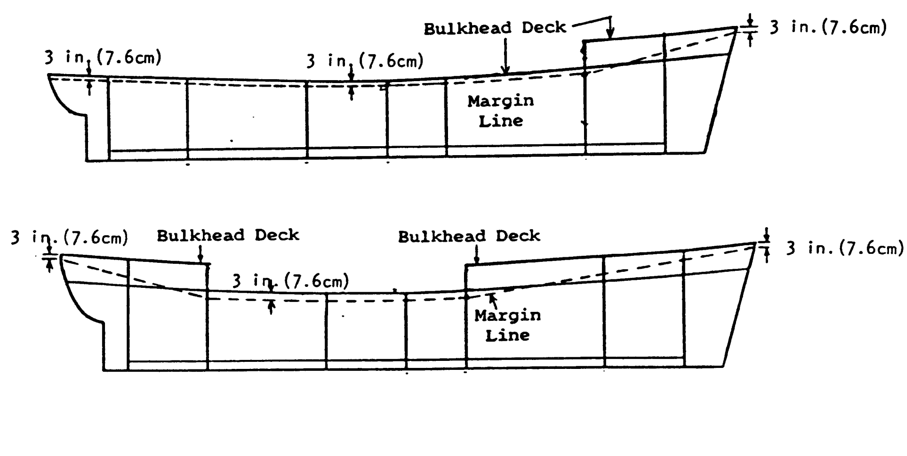
Margin Line for a Vessel With a Continuous Bulkhead Deck and With an Average Value of Sheer at the FP and AP Less Than 12 Inches (30.5 cm)



(c) *A vessel with a discontinuous bulkhead deck.* A continuous margin line must be drawn that is no more than 3 inches (7.6 cm) below the upper surface of the bulkhead deck at side as illustrated in Figure 171.015(c).

Figure 171.015(c)

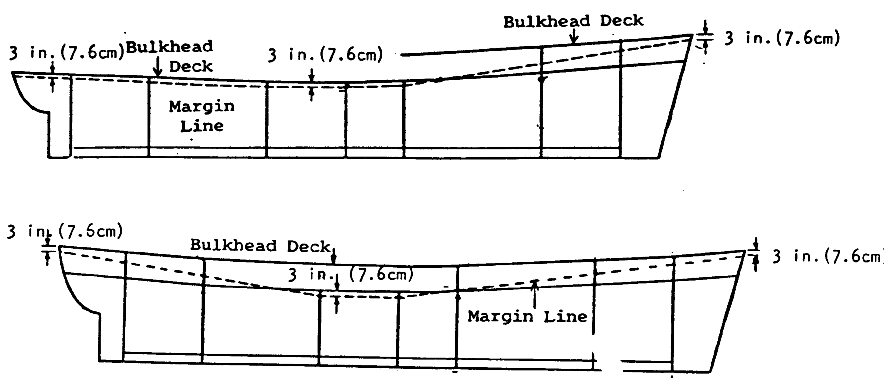
Margin Line for a Vessel With a Discontinuous Bulkhead Deck



(d) *A vessel with a discontinuous bulkhead deck where the side shell is carried watertight to a higher deck.* A continuous margin line must be drawn as illustrated in Figure 171.015(d).

Figure 171.015(d)

Margin Line for a Vessel With a Discontinuous Bulkhead Deck and With Side Shell Watertight to a Higher Deck



§ 171.017 One and two compartment standards of flooding.

(a) *One compartment standard of flooding.* A vessel is designed to a one compartment standard of flooding if the margin line is not submerged when the total buoyancy between each set of two adjacent main transverse watertight bulkheads is lost.

(b) *Two compartment standard of flooding.* A vessel is designed to a two compartment standard of flooding if the margin line is not submerged when the total buoyancy between each set of three adjacent main transverse watertight bulkheads is lost.

Subpart B—Intact Stability

§ 171.045 Weight of passengers and crew.

(a) This section applies to each vessel, regardless of when constructed.

(b) Compliance with the intact stability requirements applicable to each vessel, using a total weight of passengers and crew carried, is based upon an Assumed Average Weight per Person, which is determined in accordance with § 170.090 of this chapter.

[USCG–2007–0030, 75 FR 78085, Dec. 14, 2010]

§ 171.050 Passenger heel requirements for a mechanically propelled or a non-self propelled vessel.

(a) Each mechanically propelled or non-self propelled vessel other than a pontoon vessel must be shown by design calculations, in each condition of loading and operation, to have a metacentric height (GM) in feet (meters) of not less than the value given by the following equation:

$$GM = [(W/\Delta)(2/3)(b)]/(\tan(T))$$

Where—

Δ = displacement of the vessel in long (metric) tons.

W = total weight in long (metric) tons of persons other than required crew, including personal effects of those persons expected to be carried on the vessel.

T = 14 degrees or the angle of heel at which the deck edge is first submerged, whichever is less; and

b = distance in feet (meters) from the centerline of the vessel to the geometric center of the passenger deck on one side of the centerline.

(b) The criteria specified in paragraph (a) of this section are limited in application to the conditions of loading and operation of vessels for which the righting arm (GZ) at the angle (T), calculated after the vessel is permitted to trim free until the trimming moment is zero, is not less than the minimum metacentric height (GM) calculated in paragraph (a) of this section multiplied by sin(T). In conditions not meeting this requirement, the Coast Guard Marine Safety Center requires calculations in addition to those in this section.

(c) A vessel that complies with the requirements for passenger ships contained in the International Code of Intact Stability, 2008 (2008 IS Code) (incorporated by reference, see § 171.012) need not comply with paragraphs (a) or (b) of this section. Vessels complying with the 2008 IS Code must use the Assumed Average Weight per Person obtained according to § 170.090 of this title to be exempt from the other requirements of this section.

[USCG–2007–0030, 75 FR 78085, Dec. 14, 2010]

§ 171.052 Passenger heel requirements for pontoon vessels.

(a) Each pontoon vessel, in each condition of loading and operation, must have an area under the righting arm curve from the angle of equilibrium to an angle of 40 degrees, the downflooding angle, or the angle of the maximum righting arm, whichever is less, of at least:

(1) For operation on exposed or partially protected waters—

(i) 10 foot-degrees with a crowding density of 5 square feet per person (2.15 persons per square meter); and

(ii) 7 foot-degrees with a crowding density of 2 square feet per person (5.38 persons per square meter); and

(2) For operation on protected waters—

(i) 5 foot-degrees with a crowding density of 5 square feet per person (2.15 persons per square meter); and

(ii) 2 foot-degrees with a crowding density of 2 square feet per person (5.38 persons per square meter).

(b) When assessing compliance with the criteria of this section, passengers are assumed to be distributed in all areas accessible to passengers so as to produce the most unfavorable combination of heel and trim.

[USCG–2007–0030, 75 FR 78085, Dec. 14, 2010]

§ 171.055 Intact stability requirements for a monohull sailing vessel or a monohull auxiliary sailing vessel.

(a) Except as specified in paragraph (b) of this section, each monohull sailing vessel and auxiliary sailing vessel must be shown by design calculations to meet the stability requirements in this section.

(b) Additional or different stability requirements may be needed for a vessel of unusual form, proportion, or rig. The additional requirements, if needed, will be prescribed by the Commandant.

(c) Each vessel must have positive righting arms in each condition of loading and operation from—

(1) 0 to at least 70 degrees of heel for service on protected or partially protected waters; and

(2) 0 to at least 90 degrees of heel for service on exposed waters.

(d) Each vessel must be designed to satisfy the following equations:

(1) For a vessel in service on protected or partially protected waters—

$$\frac{1000(W)HZA}{(A)(H)} \geq X$$

$$\frac{1000(W)HZB}{(A)(H)} \geq Y$$

$$\frac{1000(W)HZC}{(A)(H)} \geq Z$$

where—

X=1.0 long tons/sq. ft. (10.9 metric tons/sq. meter).

Y=1.1 long tons/sq. ft. (12.0 metric tons/sq. meter).

Z=1.25 long tons/sq. ft. (13.7 metric tons/sq. meter).

(2) For a vessel on exposed waters—

$$\frac{1000(W)HZA}{(A)(H)} \geq X$$

$$\frac{1000(W)HZB}{(A)(H)} \geq Y$$

$$\frac{1000(W)HZC}{(A)(H)} \geq Z$$

where—

HZA, HZB, and HZC are calculated in the manner specified in paragraph (e) or (f) of this section.
X=1.5 long tons/sq. ft. (16.4 metric tons/sq. meter).
Y=1.7 long tons/sq. ft. (18.6 metric tons/sq. meter).
Z=1.9 long tons/sq. ft. (20.8 metric tons/sq. meter).
A=the projected lateral area or silhouette in square feet (meters) of the portion of the vessel above the waterline computed with all sail set and trimmed flat. Sail overlap areas need not be included except parachute type spinnakers which are to be added regardless of overlap.
H=the vertical distance in feet (meters) from the center of A to the center of the underwater lateral area or approximately to the one-half draft point.
W=the displacement of the vessel in long (metric) tons.

(e) Except as provided in paragraph (f) of this section, HZA, HZB, and HZC must be determined as follows for each condition of loading and operation:

(1) Plot the righting arm curve on Graphs 171.055 (b), (c), and (d) or (e).

(2) If the angle at which the maximum righting arm occurs is less than 35 degrees, the righting arm curve must be truncated as shown on Graph 171.055(a).

(3) Plot an assumed heeling arm curve on Graph 171.055(b) that satisfies the following conditions:

(i) The assumed heeling arm curve must be defined by the equation—

HZ=HZA $\cos^2$ (T)

where—

HZ=heeling arm.
HZA=heeling arm at 0 degrees of heel.
T=angle of heel.

(ii) The first intercept shown on Graph 171.055(b) must occur at the angle of heel corresponding to the angle at which deck edge immersion first occurs.

(4) Plot an assumed heeling arm curve on Graph 171.055(c) that satisfies the following conditions:

(i) The assumed heeling arm curve must be defined by the equation—

HZ=HZB $\cos^2$ (T)

where—

HZ=heeling arm.
HZB=heeling arm at 0 degrees of heel.
T=angle of heel.

(ii) The area under the assumed heeling arm curve between 0 degrees and the downflooding angle or 60 degrees, whichever is less, must be equal to the area under the righting arm curve between the same limiting angles.

(5) Plot an assumed heeling arm curve on Graph 171.055 (d) or (e) that satisfies the following conditions:

(i) The assumed heeling arm curve must be defined by—

HZ=HZC $\cos^2$ (T)

where—

HZ=heeling arm.
HZC=heeling arm at 0 degrees of heel.
T=angle of heel.

(ii) The area under the assumed heeling arm curve between the angles of 0 and 90 degrees must be equal to the area under the righting arm curve between 0 degrees and—

(A) 90 degrees if the righting arms are positive to an angle less than or equal to 90 degrees; or

(B) The largest angle corresponding to a positive righting arm but no more than 120 degrees if the righting arms are positive to an angle greater than 90 degrees.

(6) The values of HZA, HZB, and HZC are read directly from Graphs 171.055 (b), (c), and (d) or (e).

(f) For the purpose of this section, the downflooding angle means the static angle from the intersection of the vessel's centerline and waterline in calm water to the first opening that cannot be rapidly closed watertight.

(g) HZB and, if the righting arms are positive to an angle of 90 degrees or greater, HZC may be computed from the following equation:

$$\text{HZB (or HZC)} = \frac{I}{((T/2) + 14.3\sin 2T)}$$

where—

I=the area under the righting arm curve to—

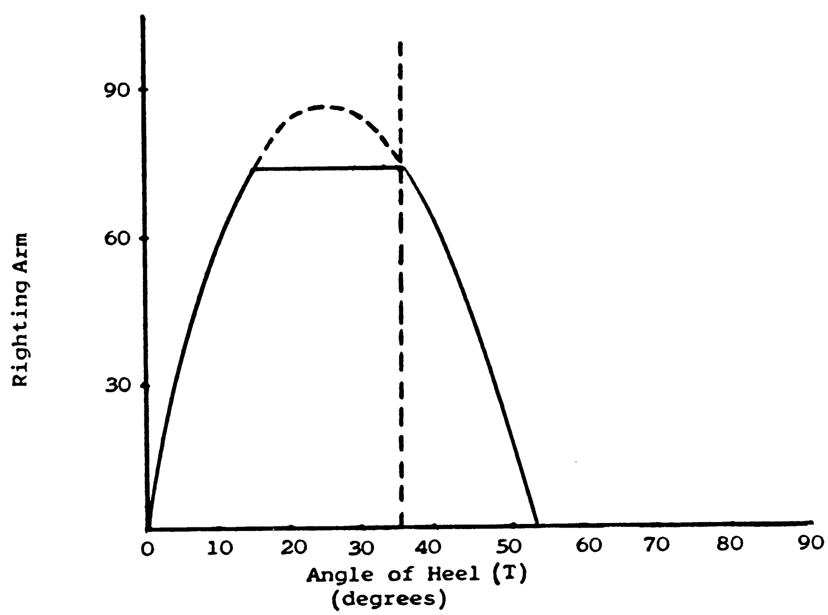
(1) the downflooding angle or 60 degrees, whichever is less, when computing HZB; or

(2) the largest angle corresponding to a positive righting arm or 90 degrees, whichever is greater, but no greater than 120 degrees when computing HZC.

T=the downflooding angle or 60 degrees, whichever is less, when computing HZB or 90 degrees when computing HZC.

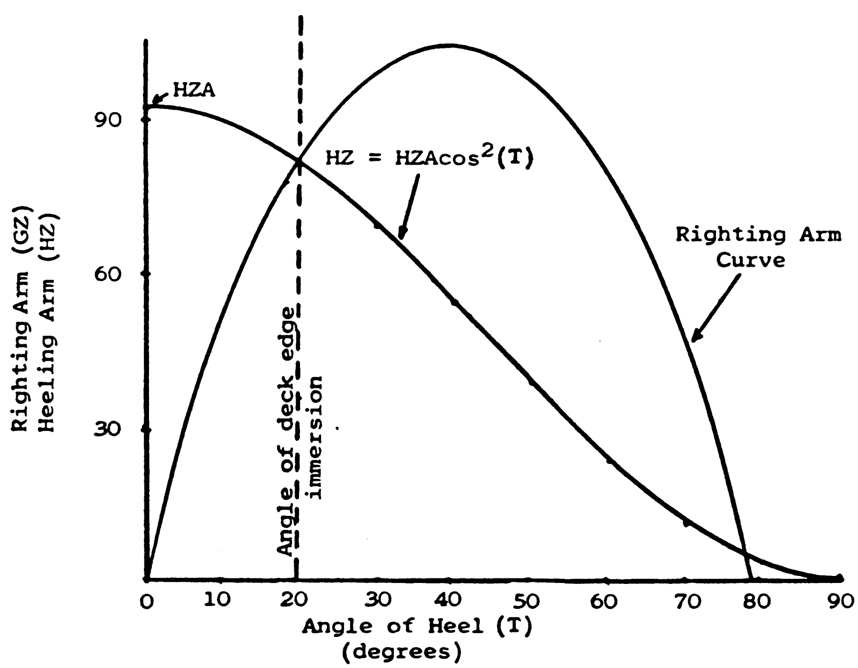
GRAPH 171.055(a)

Truncation of Righting Arm Curve if Maximum Righting Arm Occurs at an Angle of Heel Less Than 35 Degrees



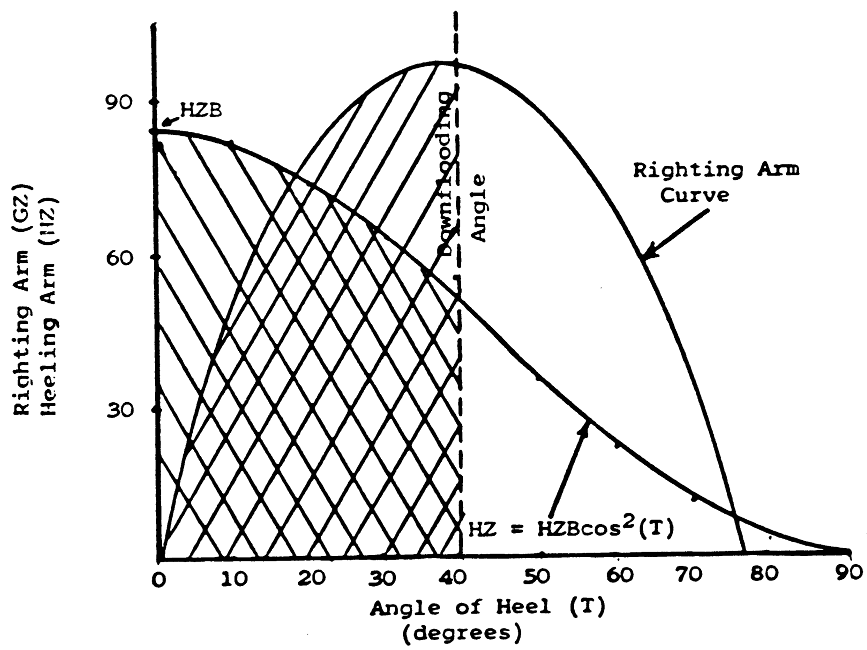
GRAPH 171.055(b)

First Intercept Occurs at the Angle at Which Deck Edge Immersion First Occurs



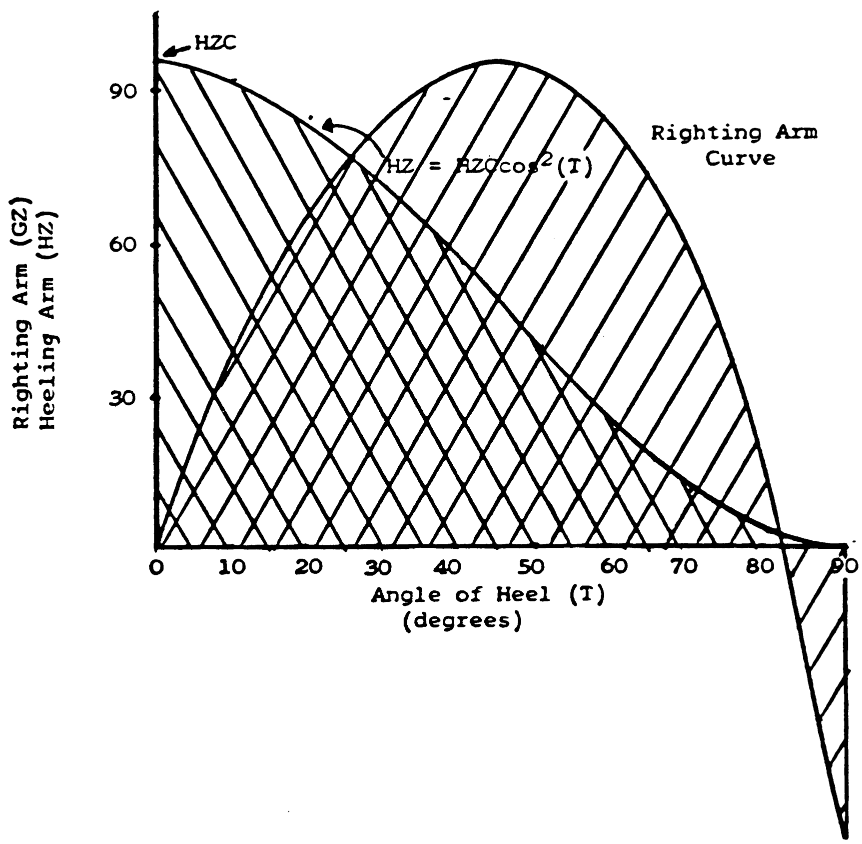
GRAPH 171.055(c)

Shaded Areas are Balanced to the Downflooding Angle



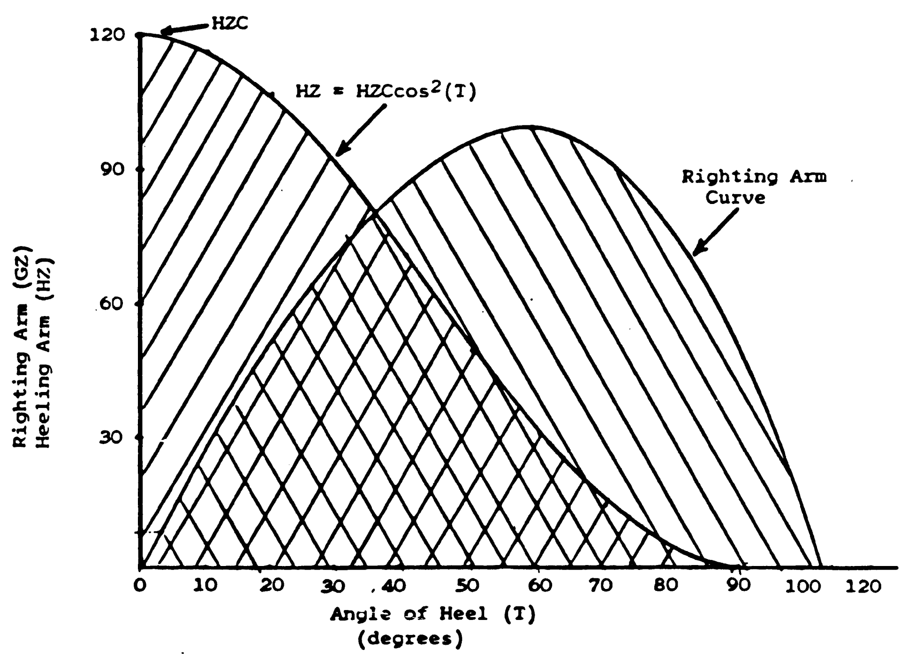
GRAPH 171.055(d)

Righting Arm Curve is not Positive to 90 Degrees and Negative Area is Included



GRAPH 171.055(e)

Righting Arm Curve is Positive Beyond 90 Degrees



[CGD 79–023, 48 FR 51017, Nov. 4, 1983, as amended by CGD 83–005, 51, FR 924, Jan. 9, 1986]

§ 171.057 Intact stability requirements for a sailing catamaran.

(a) A sailing vessel that operates on protected waters must be designed to satisfy the following equation:

$$\frac{0.1(W)B}{(As)(Hc)} \geq X$$

Where—

B=the distance between hull centerlines in meters (feet).

As=the maximum sail area in square meters (square feet).

Hc=the height of the center of effort of the sail area above the deck, in meters (feet).

W=the total displacement of the vessel, in kilograms (pounds).

X=4.88 kilograms/square meter (1.0 pounds/square foot).

(b) A sailing vessel that operates on partially protected or exposed waters must be designed to satisfy the following equation:

$$\frac{0.1(W)B}{(As)(Hc)} \geq X$$

Where—

B=the distance between hull centerlines in meters (feet).

As=the maximum sail area in square meters (square feet).

Hc=the height of the center of effort of the sail area above the deck, in meters (feet).

W=the total displacement of the vessel, in kilograms (pounds).

X=7.32 kilograms/square meter (1.5 pounds/square foot).

[CGD 79–023, 48 FR 51017, Nov. 4, 1983, as amended by CGD 83–005, 51 FR 924, Jan. 9, 1986; CGD 85–080, 61 FR 944, Jan. 10, 1996]

Subpart C—Subdivision and Damage Stability

§ 171.060 Watertight subdivision: General.

(a) Each of the following vessels must be shown by design calculations to comply with the requirements in §§ 171.065 through 171.068 for Type I subdivision:

(1) Each vessel 100 gross tons or more on an international voyage: and

(2) Each vessel 150 gross tons or more in ocean service.

(b) Each vessel not described in paragraph (a) of this section must be shown by design calculations to comply with the requirements in §§ 171.070 to 171.073 for Type II subdivision.

(c) Except as allowed in § 171.070(c), each vessel must have a collision bulkhead.

(d) Each double-ended ferry that is required by paragraph (c) of this section to have a collision bulkhead must also have a second collision bulkhead. One collision bulkhead must be located in each end of the vessel.

[CGD 79–023, 48 FR 51017, Nov. 4, 1983, as amended by USCG–2007–0030, 75 FR 78085, Dec. 14, 2010]

§ 171.065 Subdivision requirements—Type I.

(a) Except as provided in paragraphs (c) and (f) of this section, the separation between main transverse watertight bulkheads on a vessel, other than one described in paragraph (b) of this section, must not exceed—

(floodable length)×(factor of subdivision)

where—

the factor of subdivision is listed under FS in Table 171.065(a).

(b) The factor of subdivision used to determine compliance with paragraph (a) of this section must be the smaller of 0.5 or the value determined from Table 171.065(a) if—

(1) The vessel is 430 feet (131 meters) or more in LBP; and

(2) The greater of the values of Y as determined by the following equations equals or exceeds the value of X in Table 171.065(b):

$$Y = \frac{(M + 2P)}{V}$$

or

$$Y = (M + 2P1)/(V + P1 - P)$$

where—

M, V, and P have the same value as listed in Table 171.065(a); and

P1=the smaller of the following:

(i) 0.6LN (0.056LN) where—

N=the total number of passengers; and

L=LBP in feet (meters).

(ii) The greater of the following:

(A) 0.4LN (0.037LN).

(B) The sum of P and the total volume of passenger spaces above the margin line.

(c) The distance A in Figure 171.065 between main transverse watertight bulkheads may exceed the maximum allowed by paragraphs (a) or (b) of this section if each of the distances B and C between adjacent main transverse watertight bulkheads in Figure 171.065 does not exceed the smaller of the following:

(1) The floodable length.

(2) Twice the separation allowed by paragraphs (a) or (b) of this section.

(d) In each vessel 330 feet (100 meters) or more in LBP, one of the main transverse watertight bulkheads aft of the collision bulkhead must be located at a distance from the forward perpendicular that is not greater than the maximum separation allowed by paragraph (a) or (b) of this section.

(e) The minimum separation between two adjacent main transverse watertight bulkheads must be at least 10 feet (3.05 meters) plus 3 percent of the LBP of the vessel, or 35 feet (10.7 meters), whichever is less.

(f) The maximum separation of bulkheads allowed by paragraphs (a) or (b) of this section may be increased by the amount allowed in paragraph (g) of this section if—

(1) The space between two adjacent main transverse watertight bulkheads contains internal watertight volume; and

(2) After the assumed side damage specified in paragraph (h) of this section is applied, the internal watertight volume will not be flooded.

(g) For the purpose of paragraph (f) of this section, the allowable increase in separation is as follows:

$$\text{Increase in separation} = \frac{\text{"total volume of allowed local subdivision"}}{\text{"transverse sectional area at center of compartment"}}$$

where—

''total volume of allowed local subdivision'' is determined by calculating the unflooded volume on each side of the centerline and multiplying the smaller volume by two.

(h) The assumed extents of side damage are as follows:

(1) *The longitudinal extent of damage* must be assumed to extend over a length equal to the minimum spacing of bulkheads specified in paragraph (e) of this section.

(2) *The transverse extent of damage* must be assumed to penetrate a distance from the shell plating equal to one-fifth the maximum beam of the vessel and at right angles to the centerline at the level of the deepest subdivision load line.

(3) *The vertical extent of damage* must be assumed to extend vertically from the baseline to the margin line.

(i) The maximum separation between the following bulkheads must not exceed the maximum separation between main transverse watertight bulkheads:

(1) The collision bulkhead and the first main transverse watertight bulkhead aft of the collision bulkhead; and

(2) The last main transverse watertight bulkhead and the aftermost point on the bulkhead deck.

(j) The minimum separation between the following bulkheads must not be less than the minimum separation between main transverse watertight bulkheads:

(1) The collision bulkhead and the first main transverse watertight bulkhead aft of the collision bulkhead; and

(2) The last main transverse watertight bulkhead and the aftermost point on the bulkhead deck.

Figure 171.065

Combined Separation of Bulkheads

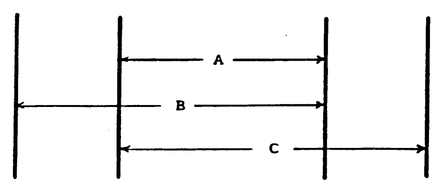


TABLE 171.065(a) (ENGLISH UNITS)

Vessel length (LBP)	Criterion numeral (CN)	FS
Vessel length greater than 392 feet.	CN less than or equal to 23.	A
	CN greater than 23 and less than 123.	F1
	CN greater than or equal to 123.	B
Vessel length greater than or equal to 200 feet and less than or equal to 392 feet.	CN less than or equal to S.	1
	CN greater than S and less than 123.	F2
	CN greater than or equal to 123.	B
Vessel length less than 200 feet.	....	1

Where—

FS=the factor of subdivision.
$CN=60((M+2P)/V)+30000(N/L^2)$
$A=(190/(L-160))+0.18$
$B=(94/(L-85))+0.18$
$F1=A-((A-B)(CN-23)/100)$
$S=(10904-25L)/48$
$F2=1-((1-B)(CN-S)/(123-S))$
L=the length of the vessel (LBP) in feet.
M=the sum of the volume of the machinery space and the volumes of any fuel tanks which are located above the inner bottom forward or aft of the machinery space in cubic feet.
P=the volume of passenger spaces below the margin line.
V=the volume of the vessel below the margin line.
N=the number of passengers that the vessel is to be certificated to carry.

TABLE 171.065(a) (METRIC UNITS)

Vessel length (LBP)	Criterion numeral (CN)	FS
Vessel length greater than 120 meters.	CN lesthan or equal to 23	A
	CN greater than 23 and less than 123.	F1
	CN greater than or equal to 123.	B
Vessel length greater than or equal to 61 meters and less than or equal to 120 meters.	CN less than or equal to S.	1
	CN greater than S and less than 123.	F2
	CN greater than or equal to 123.	B
Vessel length less than 61 meters.	....	1

Where—

FS=the factor of subdivision.
CN=60((M+2P)/V)+2787(N/L²)
A=(58/(L–49))+0.18
B=(29/(L–26))+0.18
F1=A − ((A − B)(CN − 23)/100)
S=(3323.5 − 25L)/14.6
F2=1 − ((1 − B)(CN − S)/(123 − S))
L=the length of the vessel (LBP) in meters.
M=the sum of the volume of the machinery space and the volumes of any fuel tanks which are located above the inner bottom forward or aft of the machinery space in cubic meters.
P=the volume of passenger spaces below the margin line.
V=the volume of the vessel below the margin line.
N=the number of passengers that the vessel is to be certificated to carry.

TABLE 171.065(b)—TABLE OF X

Vessel LBP in feet (meters)	X [1]
430 (131)	1.336
440 (134)	1.285
450 (137)	1.230
460 (140)	1.174
470 (143)	1.117
480 (146)	1.060
490 (149)	1.002
500 (152)	0.944
510 (155)	0.885
520 (158)	0.826
530 (162)	0.766
540 (165)	0.706
550 (168)	0.645
554 (169) and up	0.625

[1] Interpolate for intermediate values.

[CGD 79–023, 48 FR 51017, Nov. 4, 1983, as amended by USCG–2007–0030, 75 FR 78085, Dec. 14, 2010]

§ 171.066 Calculation of permeability for Type I subdivision.

(a) Except as prescribed in paragraph (b) of this section, the following permeabilities must be used when doing the calculations required to demonstrate compliance with § 171.065(a), (b), and (c):

(1) When doing calculations required to demonstrate compliance with § 171.065(a) and (b), the uniform average permeability given by the formulas in Table 171.066 must be used.

(2) When doing calculations required to demonstrate that compartments on opposite sides of a main transverse watertight bulkhead that bounds the machinery space comply with § 171.065(c), the mean of the uniform average permeabilities determined from Table 171.066 for the two compartments must be used.

(b) If an average permeability can be calculated that is less than that given by the formulas in Table 171.066, the lesser value may be substituted if approved by the Commanding Officer, Marine Safety Center. When determining this lesser value, the following permeabilities must be used:

(1) 95% for passenger, crew, and all other spaces that, in the full load condition, normally contain no cargo, stores, provisions, or mail.

(2) 60% for cargo, stores, provisions, or mail spaces.

(3) 85% for spaces containing machinery.

(4) Values approved by the Commanding Officer, Marine Safety Center for double bottoms, oil fuel, and other tanks.

(c) In the case of unusual arrangements, the Commanding Officer, Marine Safety Center may require a detailed calculation of average permeability for the portions of the vessel forward or aft of the machinery spaces. When doing these calculations, the permeabilities specified in paragraph (b) of this section must be used.

(d) When calculating permeability, the total volume of the 'tween deck spaces between two adjacent main transverse watertight bulkheads that contains any passenger or crew space must be regarded as passenger space volume, except that the volume of any space that is completely enclosed in steel buldheads and is not a crew or passenger space may be excluded.

TABLE 171.066—TABLE OF UNIFORM AVERAGE PERMEABILITIES

Location	Uniform average permeability
Machinery space	$85+\frac{10\,(a-c)}{v}$
	35(a)

TABLE 171.066—TABLE OF UNIFORM AVERAGE PERMEABILITIES—Continued

Location	Uniform average permeability
Volume forward of machinery space	$63+\frac{}{v}$
Volume aft of machinery space	$63+\frac{35(a)}{v}$

For each location specified in this table—

a=volume below the margin line of all spaces that, in the full load condition, normally contain no cargo, baggage, stores, provisions, or mail.

c=volume below the margin line of the cargo, stores, provisions, or mail spaces within the limits of the machinery space.

v=total volume below the margin line.

[CGD 79–023, 48 FR 51017, Nov. 4, 1983, as amended by CGD 88–070, 53 FR 34537, Sept. 7, 1988]

§ 171.067 Treatment of stepped and recessed bulkheads in Type I subdivision.

(a) For the purpose of this section—

(1) The main transverse watertight bulkhead immediately forward of a stepped bulkhead is referred to as bulkhead 1; and

(2) The main transverse watertight bulkhead immediately aft of the stepped bulkhead is referred to as bulkhead 3.

(b) If a main transverse watertight bulkhead is stepped, it and bulkheads 1 and 3 must meet one of the following conditions:

(1) The separation between bulkheads 1 and 3 must not exceed the following:

(i) If the factor of subdivision (FS) determined from § 171.065 (a) or (b) is greater than 0.9, the distance between bulkheads 1 and 3 must not exceed the maximum separation calculated to demonstrate compliance with § 171.065.

(ii) If the factor of subdivision is 0.9 or less, the distance between bulkheads 1 and 3 must not exceed 90% of the floodable length or twice the maximum bulkhead separation calculated to demonstrate compliance with § 171.065, whichever is smaller.

(2) Additional watertight bulkheads must be located as shown in Figure 171.067(a) so that distances A, B, C, and D, illustrated in Figure 171.067(a), satisfy the following:

(i) Distances A and B must not exceed the maximum spacing allowed by § 171.065.

(ii) Distances C and D must not be less than the minimum separation prescribed by § 171.065(e).

(3) The distance A, illustrated in Figure 171.067(b), must not exceed the maximum length determined in § 171.065 corresponding to a margin line taken 3 inches (7.6 cm) below the step.

(c) A main transverse bulkhead may not be recessed unless all parts of the recess are inboard from the shell of the vessel a distance A as illustrated in Figure 171.067(c).

(d) Any part of a recess that lies outside the limits defined in paragraph (c) of this section must be treated as a step in accordance with paragraph (b) of this section.

(e) The distance between a main transverse watertight bulkhead and the transverse plane passing through the nearest portion of a recessed bulkhead must be greater than the minimum separation specified by § 171.065(e).

(f) If a main transverse bulkhead is stepped or recessed, equivalent plane bulkheads must be used in the calculations required to demonstrate compliance with § 171.065.

Figure 171.067(a)

Additional Subdivision

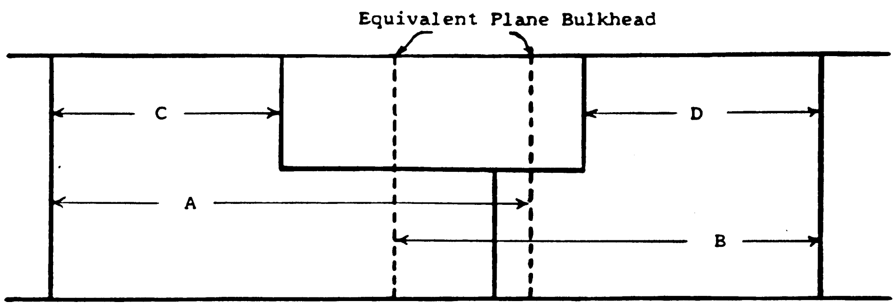


Figure 171.067(b)

Margin Line Below Step

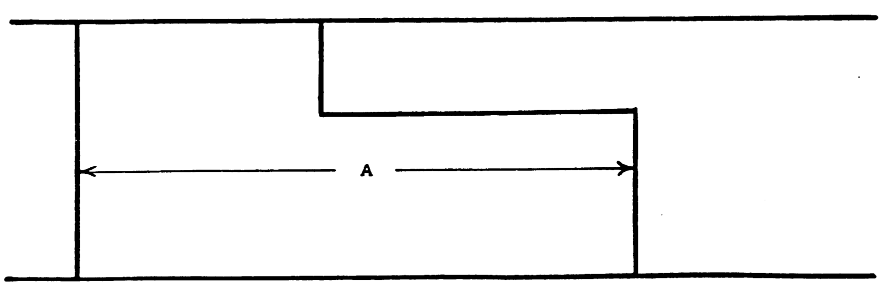
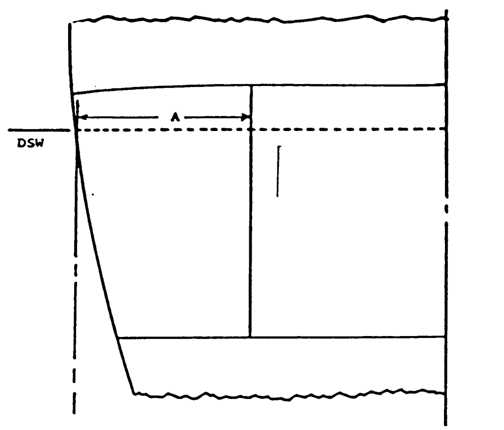


Figure 171.067(c)

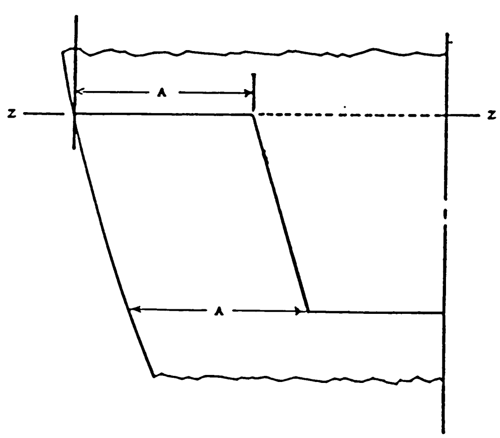
Limits of a Recess



Section Through Recess At ZZ

A = One-fifth the maximum beam measured on the waterline corresponding to the deepest subdivision waterline.

DSW = Deepest subdivision waterline



Plan View of Recess at the waterline corresponding to the deepest subdivision waterline

§ 171.068 Special considerations for Type I subdivision for vessels on short international voyages.

(a) The calculations done to demonstrate compliance with § 171.065 for a vessel that makes short international voyages and is permitted under § 75.10–10 of this chapter to carry a number of persons on board in excess of the lifeboat capacity must—

(1) Assume the uniform average permeabilities given in Table 171.068 in lieu of those in Table 171.066; and

(2) Use a factor of subdivision (FS) that is the smaller of the following:

(i) The value from Table 171.065(a).

(ii) 0.50.

(b) For a vessel less than 300 feet (91 meters) in length, the Commanding Officer, Marine Safety Center may approve the separation of main transverse watertight bulkheads greater than that permitted by paragraph (a) of this section if—

(1) The shorter separation is impracticable; and

(2) The separation is the smallest that is practicable.

(c) In the case of ships less than 180 feet (55 meters) in length, the Commanding Officer, Marine Safety Center may approve a further relaxation in the bulkhead spacing. However, in no case may the separation be large enough to prevent the vessel from complying with the flooding requirements for Type II subdivision in § 171.070.

TABLE 171.068—TABLE OF UNIFORM AVERAGE PERMEABILITIES

Location	Uniform average permeability
Machinery Space	$85+\frac{10(a-c)}{v}$
Volume Forward of Machinery Space	$95-\frac{35(b)}{v}$
Volume Aft of Machinery Space	$95-\frac{35(b)}{v}$

For each location specified in this table—

a=volume below the margin line of all spaces that, in the full load condition, normally contain no cargo, baggage, stores, provisions, or mail.

b=volume below the margin line and above the tops of floors, inner bottoms, or peak tanks of coal or oil fuel bunkers, chain lockers, fresh water tanks, and of all spaces that, in the full load condition, normally contain stores, baggage, mail, cargo, or provisions. If cargo holds are not occupied by cargo, no part of the cargo space is to be included in this volume.

c=volume below the margin line of the cargo, stores, provisions, or mail spaces within the limits of the machinery space.

v=total volume below the margin line.

[CGD 79–023, 48 FR 51017, Nov. 4, 1983, as amended by CGD 88–070, 53 FR 34537, Sept. 7, 1988]

§ 171.070 Subdivision requirements—Type II.

(a) Each vessel, except a ferry vessel, must be designed so that, while in each condition of loading and operation, it complies with the standard of flooding specified in Table 171.070(a).

(b) Except as provided in paragraph (c), each ferry vessel must be designed so that, while in each condition of loading and operation, it meets the standard of flooding specified in Table 171.070(b).

(c) A ferry vessel described in paragraph (d) of this section need not meet the standard of flooding specified in Table 171.070(b), except that a ferry vessel in Great Lakes service must at least have a collision bulkhead.

(d) Paragraph (c) of this section applies to a ferry vessel that—

(1) Is 150 feet (46 meters) or less in length; and

(2) Has sufficient air tankage, or other internal buoyancy to float the vessel with no part of the margin line submerged when the vessel is completely flooded. If foam is used to comply with this paragraph, it must be installed in accordance with the requirements in § 170.245 of this subchapter.

(e) Except as specified in paragraph (f) of this section, each main transverse watertight bulkhead must be spaced as follows:

(1) Unless otherwise permitted, if the LBP of the vessel is 143 feet (43.5 meters) or more, or the vessel makes international voyages, each main transverse watertight bulkhead must be at least 10 feet (3 meters) plus 3 percent of the vessel's LBP from—

(i) Every other main transverse watertight bulkhead;

(ii) The collision bulkhead; and

(iii) The aftermost point on the bulkhead deck.

(2) If the LBP of the vessel is less than 143 feet (43.5 meters) and the vessel does not make international voyages, each main transverse watertight bulkhead must be no less than 10 percent of the vessel's LBP or 6 feet (1.8 meters), whichever is greater, from—

(i) Every other main transverse watertight bulkhead;

(ii) The collision bulkhead; and

(iii) The aftermost point on the bulkhead deck.

(f) If a vessel is required by § 171.060 to have a collision bulkhead in each end of the vessel, then each main transverse watertight bulkhead must be no less than the distance specified in paragraph (e) of this section from—

(1) Every other main transverse watertight bulkhead; and

(2) Each collision bulkhead.

TABLE 171.070(a)—STANDARD OF FLOODING

Passengers carried	Part of vessel	Standard of flooding (compartments)
400 or less	All	1
401 to 600	All of the vessel forward of the first MTWB aft of the collision bulkhead..	2
	All remaining portions of the vessel.	1
601 to 800	All of the vessel forward of the first MTWB that is aft of a point 40% of the vessel's LBP aft of the forward perpendicular.	2
	All remaining portions of the vessel.	1
801 to 1000	All of the vessel forward of the first MTWB that is aft of a point 60% of the vessel's LBP aft of the forward prependicular..	2
	All remaining portions of the vessel.	1
More than 1000	All	2

Where for this table-

"MTWB" means main transverse watertight bulkhead; and "Standard of Flooding" is explained in §171.017 of this subchapter.

TABLE 171.070(b)—STANDARD OF FLOODING FOR FERRY VESSELS

Vessel length	Part of vessel	Standard of flooding (compartments)
150 feet (46 meters) or less.	All	1
Greater than 150 feet (46 meters) and less than or equal to 200 feet (61 meters).	All of the vessel forward of the first MTWB aft of the collision bulkhead.	2
	All of the vessel aft of the first MTWB forward of the aft peak bulkhead.	2
	All remaining portions of the vessel.	1
Greater than 200 feet (61 meters).	All	2

Where for this table—

"MTWB" means main transverse watertight bulkhead; and "Standard of Flooding" is explained in §171.017 of this subchapter.

[CGD 79–023, 48 FR 51017, Nov. 4, 1983, as amended by USCG–2007–0030, 75 FR 78085, Dec. 14, 2010]

§ 171.072 Calculation of permeability for Type II subdivision.

When doing calcualtions to show compliance with §171.070, the following uniform average permeabilities must be assumed:

(a) 85 percent in the machinery space.

(b) 60 percent in the following spaces:

(1) Tanks that are normally filled when the vessel is in the full load condition.

(2) Chain lockers.

(3) Cargo spaces.

(4) Stores spaces.

(5) Mail or baggage spaces.

(c) 95 percent in all other spaces.

§ 171.073 Treatment of stepped and recessed bulkheads in Type II subdivision.

(a) A main transverse watertight bulkhead may not be stepped unless additional watertight bulkheads are located as shown in Figure 171.067(a) so that the distances A, B, C, and D illustrated in Figure 171.067(a) comply with the following:

(1) A and B must not exceed the maximum bulkhead spacing that permits compliance with §171.070; and

(2) C and D must not be less than the minimum spacing specified in §171.070(e).

(b) A main transverse watertight bulkhead may not be recessed unless all parts of the recess are inboard from the shell of the vessel as illustrated in Figure 171.067(c).

(c) If a main transverse watertight bulkhead is recessed or stepped, an equivalent plane bulkhead must be used in the calculations required by §171.070.

§ 171.075 [Reserved]

§ 171.080 Damage stability standards for vessels with Type I or Type II subdivision.

(a) *Calculations*. Each vessel with Type I or Type II subdivision must be shown by design calculations to meet the survival conditions in paragraph (e), (f), or (g) of this section in each condition of loading and operation assuming the extent and character of damage specified in paragraph (b) of this section.

(b) *Extent and character of damage*. For the purpose of paragraph (a) of this section, design calculations must assume that the damage—

(1) Has the character specified in Table 171.080(a); and

(2) Consists of a penetration having the dimensions specified in Table 171.080(a) except that, if the most disabling penetration would be less than the penetration described in the table, the smaller penetration must be assumed.

(c) *Permeability*. When doing the calculations required in paragraph (a) of this section, the permeability of each space must be calculated in a manner approved by the Commanding Officer, Marine Safety Center or be taken from Table 171.080(c).

(d) *Definitions*. For the purposes of paragraphs (e) and (f) of this section, the following definitions apply:

(1) *New vessel* means a vessel—

(i) For which a building contract is placed on or after April 15, 1996;

(ii) In the absence of a building contract, the keel of which is laid, or which is at a similar stage of construction, on or after April 15, 1996;

(iii) The delivery of which occurs on or after January 1, 1997;

(iv) Application for the reflagging of which is made on or after January 1, 1997; or

(v) That has undergone—

(A) A major conversion for which the conversion contract is placed on or after April 15, 1996;

(B) In the absence of a contract, a major conversion begun on or after April 15, 1996; or

(C) A major conversion completed on or after January 1, 1997.

(2) *Existing vessel* means other than a new vessel.

(3) *Watertight* means capable of preventing the passage of water through the structure in any direction under a head of water for which the surrounding structure is designed.

(4) *Weathertight* means capable of preventing the penetration of water, even boarding seas, into the vessel in any sea condition.

(e) *Damage survival for all existing vessels except those vessels authorized to carry more than 12 passengers on an international voyage requiring a SOLAS Passenger Ship Safety Certificate*. An existing vessel is presumed to survive assumed damage if it meets the following conditions in the final stage of flooding:

(1) On a vessel required to survive assumed damage with a longitudinal extent of 10 feet (3 meters) plus 0.03L, the final angle of equilibrium must not exceed 7 degrees after equalization, except that the final angle may be as large as 15 degrees if—

(i) The vessel is not equipped with equalization or is equipped with fully automatic equalization; and

(ii) The Commanding Officer, Marine Safety Center approves the vessel's range of stability in the damaged condition.

(2) On a vessel required to survive assumed damage with a longitudinal extent of 20 feet (6.1 meters) plus 0.04L, the angle of equilibrium must not exceed 15 degrees after equalization.

(3) The margin line may not be submerged at any point.

(4) The vessel's metacentric height (GM) must be at least 2 inches (5 cm) when the vessel is in the upright position.

(f) *Damage survival for all new vessels except those vessels authorized to carry more than 12 passengers on an international voyage requiring a SOLAS Passenger Ship Safety Certificate*. A new vessel is presumed to survive assumed damage if it is shown by calculations to meet the conditions set forth in paragraphs (f) (1) through (7) of this section in the final stage of flooding and to meet the conditions set forth in paragraphs (f) (8) and (9) of this section in each intermediate stage of flooding. For the purposes of establishing boundaries to determine compliance with the requirements in paragraphs (f) (1) through (9), openings that are fitted with weathertight closures and that are not submerged during any stage of flooding will not be considered downflooding points.

(1) Each vessel must have positive righting arms for a minimum range beyond the angle of equilibrium as follows:

Vessel service	Required range (degrees)
Exposed waters, oceans, or Great Lakes winter ..	15

Vessel service	Required range (degrees)
Partially protected waters or Great Lakes summer	10
Protected waters	5

(2) No vessel may have any opening through which downflooding can occur within the minimum range specified by paragraph (f)(1) of this section.

(3) Each vessel must have an area under each righting-arm curve of at least 0.015 meter-radians, measured from the angle of equilibrium to the smaller of the following angles:

(i) The angle at which downflooding occurs.

(ii) The angle of vanishing stability.

(4) Except as provided by paragraph (f)(5) of this section, each vessel must have within the positive range the greater of a righting arm (GZ) equal to or greater than 0.10 meter or a GZ as calculated using the formula:

$$GZ(m) = C\left(\frac{\text{Heeling Moment}}{\Delta} + 0.04\right)$$

where—

C=1.00 for vessels on exposed waters, oceans, or Great Lakes winter;

C=0.75 for vessels on partially protected waters or Great Lakes summer;

C=0.50 for vessels on protected waters;

Δ=intact displacement; and

Heeling moment=greatest of the heeling moments as calculated in paragraphs (f)(4) (i) through (iv) of this section.

(i) The passenger heeling moment is calculated using the formula:

Passenger Heeling Moment=0.5 (n w b)

where—

n=number of passengers;

w = passenger weight used for calculations as determined in accordance with §170.090(c) of this chapter; and

b=distance from the centerline of the vessel to the geometric center on one side of the centerline of the passenger deck used to leave the vessel in case of flooding.

(ii) The heeling moment due to asymmetric escape routes for passengers, if the vessel has asymmetric escape routes for passengers, is calculated assuming that—

(A) The weight of each passenger is the weight used for calculations as determined in accordance with §170.090(c) of this chapter;

(B) Each passenger occupies 0.25 square meter of deck area; and

(C) All passengers are distributed, on available deck areas unoccupied by permanently affixed objects, toward one side of the vessel on the decks where passengers would move to escape from the vessel in case of flooding, so that they produce the most adverse heeling moment.

(iii) The heeling moment due to the launching of survival craft is calculated assuming that—

(A) All survival craft, including davit-launched liferafts and rescue boats, fitted on the side to which the vessel heels after sustained damage, are swung out if necessary, fully loaded and ready for lowering;

(B) Persons not in the survival craft swung out and ready for lowering are distributed about the centerline of the vessel so that they do not provide additional heeling or righting moments; and

(C) Survival craft on the side of the vessel opposite that to which the vessel heels remain stowed.

(iv) The heeling moment due to wind pressure is calculated assuming that—

(A) The wind exerts a pressure of 120 Newtons per square meter;

(B) The wind acts on an area equal to the projected lateral area of the vessel above the waterline corresponding to the intact condition; and

(C) The lever arm of the wind is the vertical distance from a point at one-half the mean draft, or the center of area below the waterline, to the center of the lateral area.

(5) Each vessel whose arrangements do not generally allow port or starboard egress may be exempted, by the Commanding Officer, Marine Safety Center, from the transverse passenger heeling moment required by paragraph (f)(4)(i) of this section. Each vessel exempted must have sufficient longitudinal stability to prevent immersion of the deck edge during forward or aft egress.

(6) Each vessel must have an angle of equilibrium that does not exceed—

(i) 7 degrees for flooding of one compartment;

(ii) 12 degrees for flooding of two compartments; or

(iii) A maximum of 15 degrees for flooding of one or two compartments where—

(A) The vessel has positive righting arms for at least 20 degrees beyond the angle of equilibrium; and

(B) The vessel has an area under each righting-arm curve, when the equilibrium angle is between 7 degrees and 15 degrees, in accordance with the formula:

$$A \geq 0.0025(\theta - 1)$$

where—

A=Area required in m-rad under each righting-arm curve measured from the angle of equilibrium to the smaller of either the angle at which downflooding occurs or the angle of vanishing stability.

θ=actual angle of equilibrium in degrees

(7) The margin line of the vessel must not be submerged when the vessel is in equilibrium.

(8) Each vessel must have a maximum angle of equilibrium that does not exceed 15 degrees during intermediate stages of flooding.

(9) Each vessel must have a range of stability and a maximum righting arm during each intermediate stage of flooding as follows:

Vessel service	Required range (degrees)	Required maximum righting arm
Exposed waters, oceans, or Great Lakes winter	7	0.05 m
Partially-protected waters or Great Lakes summer	5	0.035 m
Protected waters	5	0.035 m

Only one breach in the hull and only one free surface need be assumed when meeting the requirements of this paragraph.

(g) *Damage survival for vessels constructed before January 1 2009 authorized to carry more than 12 passengers on an international voyage requiring a SOLAS Passenger Ship Safety Certificate.* A vessel is presumed to survive assumed damage if it is shown by calculations to comply with the damage stability required for that vessel by the International Convention for the Safety of Life at Sea, 1974, as amended, the applicable regulations of IMO Res. MSC.216(82) (incorporated by reference, see §171.012).

(h) *Equalization.* (1) Equalization systems on vessels of 150 gross tons or more in ocean service must meet the following:

(i) Equalization must be automatic except that the Commanding Officer, Marine Safety Center may approve other means of equalization if—

(A) It is impracticable to make equalization automatic; and

(B) Controls to cross-flooding equipment are located above the bulkhead deck.

(ii) Equalization must be fully accomplished within 15 minutes after damage occurs.

(2) Equalization on vessels under 150 gross tons in ocean service and on all vessels in other than ocean service must meet the follmwing:

(i) Equalization must not depend on the operation of valves.

(ii) Equalization must be fully accomplished within 15 minutes after damage occurs.

(3) The estimated maximum angle of heel before equalization must be approved by the Commanding Officer, Marine Safety Center.

TABLE 171.080(a)—EXTENT AND CHARACTER OF DAMAGE

Vessel designator [1]	Longitudinal penetration [2]	Transverse penetration [3,4]	Vertical penetration	Character of Damage
Z	10 feet (3 meters) plus).03L or 35 feet (10.7 meters) whichever is less. [5]	B/5	from the baseline upward without limit.	Assumes no damage to any main transverse watertight bulkhead.
Y	10 feet (3 meters) plus)0.03L or 35 feet (10.7 meters) whichever is less.	B/5	From the baseline upward without limit.	Assumes damage to no more than one main transverse watertight bulkhead.
X	10 feet (3 meters) plus)0.03L or 35 feet (10.7 meters whichever is less.	B/5	from the baseline upward without limit.	Assumes damage to no more than one main transverse watertight bulkhead.
	20 feet (6.1 meters) plus 0.04L	B/5	From the top of the double bottom upward without limit.	Assumes damage to no more than one main transverse watertight bulkhead.

TABLE 171.080(a)—EXTENT AND CHARACTER OF DAMAGE—Continued

Vessel designator [1]	Longitudinal penetration [2]	Transverse penetration [3,4]	Vertical penetration	Character of Damage
W	20 feet (6.1 meters) plus 0.04L	B/5	From the baseline upward without limit.	Assumes damage to at least two main transverse watertight bulkheads.

([1]) W,X,Y, and Z are determined from Table 171.080(b).
([2]) L=LBP of the vessel in feet (meters).
([3]) B=the beam of the vessel in feet (meters) measured at or below the deepest subdivision load line as defined in 171.010(a) except that, when doing calculations for a vessel that operates only on inland waters or a ferry vessel, B may be taken as the mean of the maximum beam on the bulkhead deck and the maximum beam at the deepest subdivision load line.
([4]) The transverse penetration is applied inboard from the side of the vessel, at right angles to the centerline, at the level of the deepest subdivision load line.
([5]) .1L or 6 feet (1.8 meters) whichever is greater for vessels described in § 171.070(e)(2).

TABLE 171.080(b)

Vessel category	Vessel designator
Vessels with type I subdivision and a factor of subdivision as determined from § 171.065 (a) or (b) of 0.33 or less.	W.
Vessels with type I subdivision and a factor of subdivision as determined from § 171.065 (a) or (b) greater than 0.33 and less than or equal to 0.50.	X.
Vessels with Type II subdivision that are required to meet a two compartment standard of flooding.	Y.
All other vessels	Z.

TABLE 171.080(c)—PERMEABILITY

Spaces and tanks	Permeability (percent
Cargo, coal, stores	60.
Accommodations	95.
Machinery	85.
Tanks	o or 95.[1]

[1] Whichever value results in the more disabling condition.

[CGD 79–023, 48 FR 51017, Nov. 4, 1983, as amended by CGD 88–070, 53 FR 34537, Sept. 7, 1988; CGD 89–037, 57 FR 41826, Sept. 11, 1992; CGD 94–010, 60 FR 53713, Oct. 17, 1995; CGD 97–057, 62 FR 51049, Sept. 30, 1997; USCG–2007–29018, 72 FR 53968, Sept. 21, 2007; USCG–2007–0030, 75 FR 78085, Dec. 14, 2010]

Subpart D—Additional Subdivision Requirements

§ 171.085 Collision bulkhead.

(a) Paragraphs (b) through (g) of this section apply to each vessel of 100 gross tons or more and paragraphs (h) through (j) of this section apply to each vessel that is less than 100 gross tons.

(b) The portion of the collision bulkhead that is below the bulkhead deck must be watertight.

(c) Each portion of the collision bulkhead must be at least—

(1) 5 percent of the LBP from the forward perpendicular in a motor vessel; and

(2) 5 feet (1.52 meters) from the forward perpendicular in a steam vessel.

(d) The collision bulkhead must be no more than 10 feet (3 meters) plus 5 percent of the LBP from the forward perpendicular.

(e) The collision bulkhead must extend to the deck above the bulkhead deck if the vessel—

(1) Is in ocean service; and

(2) Has a superstructure that extends from a point forward of the collision bulkhead to a point at least 15 percent of the LBP aft of the collision bulkhead.

(f) The collision bulkhead required by paragraph (e) of this section must have the following characteristics:

(1) The portion of the collision bulkhead above the bulkhead deck must be weathertight.

(2) If the portion of the collision bulkhead above the bulkhead deck is not located directly above the collision bulkhead below the bulkhead deck, then the bulkhead deck between must be weathertight.

(g) Each opening in the collision bulkhead must—

(1) Be located above the bulkhead deck; and

(2) Have a watertight closure.

(h) Each collision bulkhead—

(1) Must extend to the deck above the bulkhead deck if in ocean service as defined in § 170.050(f) of this chapter or to the bulkhead deck if in service on other waters;

(2) May not have watertight doors in it; and

(3) May have penetrations and openings that—

(i) Are located as high and as far inboard as practicable; and

(ii) Except as provided in paragraph (i) of this section, have means to make them watertight.

(i) Each vessel that is not required to comply with a one or two compartment standard of flooding may have an opening that cannot be made watertight in the collision bulkhead below the bulkhead deck if—

(1) The lowest edge of the opening is not more than 12 inches (30.5 centimeters) below the bulkhead deck; and

(2) There are at least 36 inches (92 centimeters) of intact collision bulkhead below the lower edge of the opening.

(j) Each portion of the collision bulkhead must be—

(1) At least 5 percent of the LBP from the forward perpendicular; and

(2) No more than 15 percent of the LBP from the forward perpendicular if the space forward of the collision bulkhead is not subject to damage stability requirements and at any location aft of the location described in paragraph (j)(1) of this section if the space forward of the collision bulkhead is subject to damage stability requirements.

[CGD 79–023, 48 FR 51017, Nov. 4, 1983, as amended by CGD 85–080, 61 FR 945, Jan. 10, 1996]

§ 171.090 Aft peak bulkhead.

(a) Each of the following vessels must have an aft peak bulkhead:

(1) Each vessel 100 gross tons or more on an international voyage.

(2) Each other vessel of more than 150 gross tons.

(b) Except as specified in paragraph (c) of this section, each portion of the aft peak bulkhead below the bulkhead deck must be watertight.

(c) A vessel may have an aft peak bulkhead that does not intersect the bulkhead deck if approved by the Commanding Officer, Marine Safety Center.

[CGD 79–023, 48 FR 51017, Nov. 4, 1983, as amended by CGD 88–070, 53 FR 34537, Sept. 7, 1988]

§ 171.095 Machinery space bulkhead.

(a) This section applies to each vessel of 100 gross tons or more.

(b) Except as provided in paragraph (c) of this section, a vessel required to have Type I or II subdivision must have enough main transverse watertight bulkheads to separate the machinery space from the remainder of the vessel. All portions of these bulkheads must be watertight below the bulkhead deck.

(c) Compliance with paragraph (b) of this section is not required if the vessel has sufficient air tanks or other internal buoyancy to maintain the vessel afloat while in the full load condition when all compartments and all other tanks are flooded. If foam is used to comply with this paragraph, it must be installed in accordance with the requirements in § 170.245 of this subchapter.

§ 171.100 Shaft tunnels and stern tubes.

(a) Stern tubes in each of the following vessels must be enclosed in watertight spaces:

(1) Each vessel of 100 gross tons or more on an international voyage.

(2) Each other vessel over 150 gross tons in ocean or Great Lakes service.

(3) Each vessel under 100 gross tons that carries more than 12 passengers on an international voyage.

(b) The watertight seal in the bulkhead between the stern tube space and the machinery space must be located in a watertight shaft tunnel. The vessel must be designed so that the margin line will not be submerged when the watertight shaft tunnel is flooded.

(c) If a vessel has two or more shaft tunnels, they must be connected by a watertight passageway.

(d) If a vessel has two or less shaft tunnels, only one door is permitted between them and the machinery space. If a vessel has more then two shaft tunnels, only two doors are permitted between them and the machinery space.

§ 171.105 Double bottoms.

(a) This section applies to each vessel that carries more than 12 passengers on an international voyage and all other vessels that are—

(1) 100 gross tons or more; and

(2) In ocean or Great Lakes service.

(b) Each vessel over 165 feet (50 meters) and under 200 feet (61 meters) in LBP must have a double bottom that extends from the forward end of the machinery space to the fore peak bulkhead.

(c) Each vessel over 200 feet (61 meters) and under 249 feet (76 meters) in LBP must have a double bottom that extends from the fore peak bulkhead to the forward end of the machinery space and a double bottom that extends from the aft peak bulkhead to the aft end of the machinery space.

(d) Each vessel 249 feet (76 meters) in LBP and upward must have a double bottom that extends from the fore to the aft peak bulkhead.

(e) Each double bottom required by this section must be at least the depth at the centerline given by the following equation:

$$D=18.0+0.05(L) \text{ inches}$$
$$D=45.7+0.417(L) \text{ centimeters}$$

where—

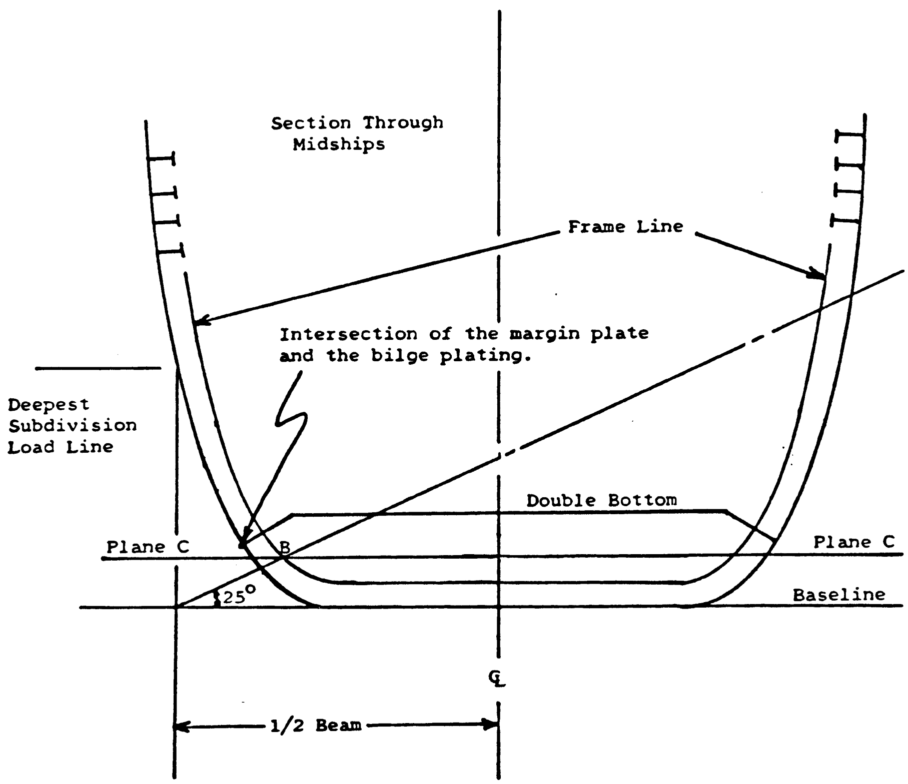
D=the depth at the centerline in inches (centimeters).

L=LBP in feet (meters).

(f) The line formed by the intersection of the margin plate and the bilge plating must be above the horizontal plane C, illustrated in Figure 171.105, at all points. The horizontal plane C is defined by point B, located, as shown in Figure 171.105, in the midships section.

Figure 171.105

Lower Limit of the Intersection of Margin Plate and Bilge Plating



(g) A double bottom is not required in a tank that is integral with the hull of a vessel if—

(1) The tank is used exclusively for the carriage of liquids; and

(2) It is approved by the Commanding Officer, Marine Safety Center.

(h) A double bottom is not required in any part of a vessel where the separation of main transverse watertight bulkheads is governed by a factor of subdivision less than or equal to 0.50 if—

(1) The Commanding Officer, Marine Safety Center approves;

(2) The vessel makes short international voyages; and

(3) The vessel is permitted by § 75.10–10 of this chapter to carry a number of passengers in excess of the lifeboat capacity.

[CGD 79–023, 48 FR 51017, Nov 4. 1983, as amended by CGD 88–070, 53 FR 34532, Sept. 7, 1988]

§ 171.106 Wells in double bottoms.

(a) This section applies to each vessel that has a well installed in a double bottom required by § 171.105.

(b) Except as provided in paragraph (c) of this section—

(1) The depth of a well must be at least 18 inches (45.7 cm) less than the depth of the double bottom at the centerline; and

(2) The well may not extend below the horizontal plane C illustrated in Figure 171.105.

(c) A well may extend to the outer bottom of a double bottom at the after end of a shaft tunnel.

§ 171.108 Manholes in double bottoms.

(a) The number of manholes in the inner bottom of a double bottom required by § 171.105 must be reduced to the minimum required for adequate access.

(b) Each manhole must have a cover that can be—

(1) Made watertight; and

(2) Protected from damage by cargo or coal.

§ 171.109 Watertight floors in double bottoms.

If a vessel is required to have a double bottom, a watertight transverse division must be located in the double bottom under each main transverse watertight bulkhead or as near as practicable to the main transverse watertight bulkhead. If a vessel also has duct keels, the transverse divisions need not extend across them.

Subpart E—Penetrations and Openings in Watertight Bulkheads

§ 171.110 Specific applicability.

(a) Sections 171.111, 171.112, and 171.113 apply to each vessel of 100 gross tons or more.

(b) Section 171.114 applies to each vessel under 100 gross tons.

[CGD 79–023, 48 FR 51017, Nov. 4, 1983, as amended by CGD 85–080, 61 FR 945, Jan. 10, 1996; 62 FR 51353, Sept. 30, 1997]

§ 171.111 Penetrations and openings in watertight bulkheads in vessels of 100 gross tons or more.

(a) Except as provided in paragraph (f) of this section, each opening in a watertight bulkhead must have a means to close it watertight.

(b) Except in a machinery space, the means for closing each opening may not be by bolted portable plates.

(c) If a main transverse watertight bulkhead is penetrated, the penetration must be made watertight. Lead or other heat sensitive materials must not be used in a system that penetrates a main transverse watertight bulkhead if fire damage to this system would reduce the watertight integrity of the bulkhead.

(d) A main transverse watertight bulkhead must not be penetrated by valves or cocks unless they are a part of a piping system.

(e) If a pipe, scupper, or electric cable passes through a main transverse watertight bulkhead, the opening through which it passes must be watertight.

(f) A main transverse watertight bulkhead may not have non-watertight penetrations below the bulkhead deck unless—

(1) The margin line is more than 9 inches (23 centimeters) below the bulkhead deck at the intersection of the margin line and the line formed by the intersection of the plane of the main transverse watertight bulkhead and the shell; and

(2) Making all penetrations watertight is impracticable.

(g) Penetrations approved in accordance with paragraph (f) of this section must comply with the following:

(1) The bottom of the penetration must not be located—

(i) More than 24 inches (61 centimeters) below the bulkhead deck; nor

(ii) Less than 9 inches (23 centimeters) above the margin line.

(2) The penetration must not be located outboard from the centerline more than ¼ of the beam of the vessel measured—

(i) On the bulkhead deck; and

(ii) In the vertical plane of the penetration.

(h) No doors, manholes, or other access openings may be located in a watertight bulkhead that separates two cargo spaces or a cargo space and a permanent or reserve bunker.

§ 171.112 Watertight door openings.

(a) The opening for a watertight door must be located as high in the bulkhead and as far inboard as practicable.

(b) No more than one door, other than a door to a bunker or shaft alley, may be fitted in a main transverse watertight bulkhead within spaces containing the following:

(1) Main and auxiliary propulsion machinery.

(2) Propulsion boilers.

(3) Permanent bunkers.

§ 171.113 Trunks.

(a) For the purpose of this section, ''trunk'' means a large enclosed passageway through any deck or bulkhead of a vessel.

(b) Each trunk, other than those specified in paragraph (c) of this section, must have a watertight door at each end except that a trunk may have a watertight door at one end if—

(1) The trunk does not pass through more than one main compartment;

(2) The sides of the trunk are not nearer to the shell than is permitted by § 171.067(c) for the sides of a recess in a bulkhead; and

(3) The vessel complies with the subdivision requirements in this part when the volume of the trunk is included with the volume of the compartment into which it opens.

(c) Each trunk that provides access from a crew accommodation space and that passes through a main transverse watertight bulkhead must comply with the following:

(1) The trunk must be watertight.

(2) The trunk, if used for passage at sea, must have at least one end above the margin line and access to the other end of the trunk must be through a watertight door.

(3) The trunk must not pass through the first main transverse watertight bulkhead aft of the collision bulkhead.

§ 171.114 Penetrations and openings in watertight bulkheads in a vessel less than a 100 gross tons.

(a) Penetrations and openings in watertight bulkheads must—

(1) Be kept as high and as far inboard as practicable; and

(2) Have means to make them watertight.

(b) Watertight bulkheads must not have sluice valves.

(c) Each main traverse watertight bulkhead must extend to the bulkhead deck.

[CGD 85–080, 62 FR 51353, Sept. 30, 1997]

Subpart F—Openings in the Side of a Vessel Below the Bulkhead or Weather Deck

§ 171.115 Specific applicability.

(a) Sections 171.116, 171.117, and 171.118 apply to each vessel of 100 gross tons or more.

(b) Section 171.119 applies to each vessel under 100 gross tons.

[CGD 79–023, 48 FR 51017, Nov. 4, 1983, as amended by CGD 85–080, 61 FR 945, Jan. 10, 1996; 62 FR 51353, Sept. 30, 1997]

§ 171.116 Port lights.

(a) A vessel may have port lights below the bulkhead deck if—

(1) It is greater than 150 gross tons; and

(2) It is in ocean service.

(b) All port lights in a space must be non-opening if the sill of any port light in that space is below a line that—

(1) Is drawn parallel to the line formed by the intersection of the bulkhead deck and the shell of the vessel; and

(2) Has its lowest point 2½ percent of the beam of the vessel above the deepest subdivision load line.

(c) For the purpose of paragraph (b) of this section, the beam of the vessel is measured at or below the deepest subdivision load line.

(d) Except as provided in paragraph (e) of this section, no port light may be located in a space that is used exclusively for the carriage of cargo, stores, or coal.

(e) A port light may be located in a space used alternately for the carriage of cargo or passengers.

(f) Each port light installed below the bulkhead deck must conform to the following requirements:

(1) The design of each port light must be approved by the Commanding Officer, Marine Safety Center.

(2) Each non-opening port light must be watertight.

(3) Each opening port light must be constructed so that it can be secured watertight.

(4) Each opening port light must be installed with at least one bolt that is secured by a round slotted or recessed nut that requires a special wrench to remove. The nut must be protected by a sleeve or guard to prevent it from being removed with ordinary tools.

[CGD 79–023, 48 FR 51017, Nov. 4, 1983, as amended by CGD 88–070, 53 FR 34537, Sept. 7, 1988]

§ 171.117 Dead covers.

(a) Except as provided in paragraph (b) of this section, each port light with the sill located below the margin line must have a hinged, inside dead cover.

(b) The dead cover on a port light located in an accommodation space for passengers other than steerage passengers may be portable if—

(1) The apparatus for stowing the dead cover is adjacent to its respective port light;

(2) The port light is located above the deck that is immediately above the deepest subdivision load line;

(3) The port light is aft of a point one-eighth of the LBP of the vessel from the forward perpendicular; and

(4) The port light is above a line that—

(i) Is parallel to the line formed by the intersection of the bulkhead deck and the side of the vessel; and

(ii) Has its lowest point at a height of 12 feet (3.66 meters) plus 2½ percent of the beam of the vessel above the deepest subdivision load line.

(c) For the purpose of paragraph (b) of this section, the beam of the vessel is measured at or below the deepest subdivision load line.

(d) Each dead cover must be designed so that—

(1) It can be secured watertight; and

(2) It is not necessary to release any of the special nuts required in § 171.116(f)(4) in order to secure the dead cover.

§ 171.118 Automatic ventilators and side ports.

(a) An automatic ventilator must not be fitted in the side of a vessel below the bulkhead deck unless approved by the Commanding Officer, Marine Safety Center.

(b) The design and construction of each gangway, cargo and coaling port, and similar opening in the side of a vessel must be approved by the Commanding Officer, Marine Safety Center.

(c) In no case may the lowest point of any gangway, cargo and coaling port, or similar opening be below the deepest subdivision load line.

[CGD 79–023, 48 FR 51017, Nov. 4, 1983, as amended by CGD 88–070, 53 FR 34537, Sept. 7, 1988]

§ 171.119 Openings below the weather deck in the side of a vessel less than 100 gross tons.

(a) If a vessel operates on exposed or partially protected waters, an opening port light is not permitted below the weather deck unless—

(1) The sill is at least 30 inches (76.2 centimeters) above the deepest subdivision load line; and

(2) It has an inside, hinged dead cover.

(b) Except for engine exhausts, each inlet or discharge pipe that penetrates the hull below a line drawn parallel to and at least 6 inches (15.2 centimeters) above the deepest subdivision load line must have means to prevent water from entering the vessel if the pipe fractures or otherwise fails.

(c) A positive action valve or cock that is located as close as possible to the hull is an acceptable means for complying with paragraph (b) of this section.

(d) If an inlet or discharge pipe is inaccessible, the means for complying with paragraph (b) of this section must be a shut-off valve that is—

(1) Operable from the weather deck or other accessible location above the bulkhead deck; and

(2) Labeled at the operating point for identity and direction of closing.

(e) Any connecting device or valve in a hull penetration must not be cast iron.

(f) Each plug cock in an inlet or discharge pipe must have a means, other than a cotter pin, to prevent its loosening or removal from the body.

[CGD 85–080, 62 FR 51353, Sept. 30, 1997]

Subpart G—Watertight Integrity Above the Margin Line

§ 171.120 Specific applicability.

Each vessel that is 100 gross tons or more must comply with § 171.122 and each vessel under 100 gross tons must comply with § 171.124.

[CGD 85–080, 62 FR 51354, Sept. 30, 1997]

§ 171.122 Watertight integrity above the margin line in a vessel of 100 gross tons or more.

(a) For the purpose of this section, a partial watertight bulkhead is one in which all portions are not watertight.

(b) Except as provided in paragraph (d) of this section, the bulkhead deck or a deck above it must be weathertight.

(c) Partial watertight bulkheads or web frames must be located in the immediate vicinity of main transverse watertight bulkheads to minimize as much as practicable the entry and spread of water above the bulkhead deck.

(d) If a partial watertight bulkhead or web frame is located on the bulkhead deck in order to comply with paragraph (c) of this section, the joint between it and the shell and bulkhead deck must be watertight.

(e) If a partial watertight bulkhead does not line up with a main transverse watertight bulkhead below the bulkhead deck, the bulkhead deck between them must be watertight.

(f) Each opening in an exposed weather deck must—

(1) Have a coaming that complies with the height requirements in table 171.124(d); and

(2) Have a means for closing it weathertight.

(g) Each port light located between the bulkhead deck and the next deck above the bulkhead deck must have an inside dead cover than can be secured watertight.

[CGD 79–023, 48 FR 51017, Nov. 4, 1983, as amended by CGD 85–080, 61 FR 945, Jan. 10, 1996; 62 FR 51354, Sept. 30, 1997]

§ 171.124 Watertight integrity above the margin line in a vessel less than 100 gross tons.

(a) Each hatch exposed to the weather must be watertight; except that, the following hatches may be weathertight:

(1) Each hatch on a watertight trunk that extends at least 12 inches (30.5 centimeters) above the weather deck.

(2) Each hatch in a cabin top.

(3) Each hatch on a vessel that operates only on protected waters.

(b) Each hatch cover must—

(1) Have securing devices; and

(2) Be attached to the hatch frame or coaming by hinges, captive chains, or to other devices to prevent its loss.

(c) Each hatch that provides access to crew or passenger accommodations must be operable from either side.

(d) Except as provided in paragraph (e) of this section, a weathertight door with permanent watertight coamings that comply with the height requirements in table 171.124(d) must be provided for each opening located in a deck house or companionway that—

(1) Gives access into the hull; and

(2) Is located in—

(i) A cockpit;

(ii) A well; or

(iii) An exposed location on a flush deck vessel.

TABLE 171.124(d)

Route	Height of coaming
Exposed or partially protected	6 inches (15.2 centimeters).
Protected	3 inches (7.6 centimeters).

(e) If an opening in a location specified in paragraph (d) of this section is provided with a Class 1 watertight door, the height of the watertight coaming need only be sufficient to accommodate the door.

[CGD 85–080, 62 FR 51354, Sept. 30, 1997]

Subpart H—Drainage of Weather Decks

§ 171.130 Specific applicability.

(a) Section 171.135 applies to each vessel that is 100 gross tons or more.

(b) Sections 171.140, 171.145, 171.150, and 171.155 apply to each vessel under 100 gross tons.

[CGD 79–023, 48 FR 51017, Nov. 4, 1983, as amended by CGD 85–080, 61 FR 945, Jan. 10, 1996; 62 FR 51354, Sept. 30, 1997]

§ 171.135 Weather deck drainage on a vessel of 100 gross tons or more.

The weather deck must have freeing ports, open rails, and scuppers, as necessary, to allow rapid clearing of water under all weather conditions.

§ 171.140 Drainage of a flush deck vessel.

(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 vessel with a flush deck 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, 62 FR 51354, Sept. 30, 1997]

§ 171.145 Drainage of a vessel with a cockpit.

(a) Except as follows, the cockpit must be watertight:

(1) A cockpit may have companionways if they comply with § 171.124(d).

(2) A cockpit may have ventilation openings along its inner periphery if—

(i) The vessel operates only on protected or partially protected waters;

(ii) The ventilation openings are located as high as possible in the side of the cockpit; and

(iii) The height of the ventilation opening does not exceed 2 inches (5 centimeters).

(b) The cockpit must be designed to be self-bailing.

(c) Scuppers installed in a cockpit must be located to allow rapid clearing of water in all probable conditions of list and trim.

(d) Scuppers must have a combined area of at least the area given by either of the following equations:

$A=0.1(D)$ square inches.

$A=6.94(D)$ square centimeters.

Where—

A = the combined area of the scuppers in square inches (square centimeters).

D = the area of the cockpit in square feet (square meters).

(e) The cockpit deck of a vessel that operates on exposed or partially protected waters must be at least 10 inches (24.5 centimeters) above the deepest subdivision load line, unless the vessel complies with—

(1) The intact stability requirements of § 171.150;

(2) The Type II subdivision requirements in §§ 171.070, 171.072, and 171.073; and

(3) The damage stability requirements in § 171.080.

(f) The cockpit deck of all vessels that do not operate on exposed or partially protected waters must be located as high above the deepest subdivision load line as practicable.

[CGD 85–080, 62 FR 51354, Sept. 30, 1997]

§ 171.150 Drainage of a vessel with a well deck.

(a) Each well deck on a vessel must be watertight.

(b) Except as provided in paragraphs (c) and (d) of this section, the area required for freeing ports in the bulwarks that form a well must be determined as follows:

(1) If a vessel operates on exposed or partially protected waters, it must have at least 100 percent of the freeing port area derived from table 171.150.

(2) If a vessel operates only on protected or partially protected waters and complies with the requirements in the following sections for a vessel that operates on exposed waters, it must have at least 50 percent of the freeing port area derived from table 171.150:

(i) The intact stability requirements of § 171.030 or 171.050 and § 171.170.

(ii) The subdivision requirements of § 171.040, 171.043, or 171.070.

(iii) The damage stability requirements of § 171.080.

(3) If a vessel operates only on protected waters, the freeing port area must be at least equal to the scupper area required by § 171.145(d) for a cockpit of the same size.

(c) The freeing ports must be located to allow rapid clearing of water in all probable conditions of list and trim.

(d) If a vessel that operates on exposed or partially protected waters does not have free drainage from the foredeck aft, then the freeing port area must be derived from table 171.150 using the entire bulwark length rather than the bulwark length in the after two-thirds of the vessel as stated in the table.

TABLE 171.150

Height of solid bulwark in inches (centimeters)	Freeing port area [1,2]
6(15)	2(42.3)
12(30)	4(84.7)
18(46)	8(169.3)
24(61)	12(253.9)
30(76)	16(338.6)
36(91)	20(423.2)

[1] Intermediate values of freeing port area can be obtained by interpolation.
[2] In square inches per foot (square centimeters per meter) of bulwark length in the after ⅔ of the vessel.

[CGD 85–080, 62 FR 51354, Sept. 30, 1997]

§ 171.155 Drainage of an open boat.

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

[CGD 85–080, 62 FR 51355, Sept. 30, 1997]

PART 172—SPECIAL RULES PERTAINING TO BULK CARGOES

Subpart A—General

Sec.

Subpart B—Bulk Grain

Subpart C—Special Rules Pertaining to a Barge That Carries a Cargo Regulated Under Subchapter D of This Chapter

Subpart D—Special Rules Pertaining to a Vessel That Carries a Cargo Regulated Under 33 CFR Part 157

Subpart E—Special Rules Pertaining to a Barge That Carries a Hazardous Liquid Regulated Under Subchapter O of This Chapter

Subpart F—Special Rules Pertaining to a Ship That Carries a Hazardous Liquid Regulated Under Subchapter O of This Chapter

Subpart G—Special Rules Pertaining to a Ship That Carries a Bulk Liquefied Gas Regulated Under Subchapter O of This Chapter

Subpart H—Special Rules Pertaining to Great Lakes Dry Bulk Cargo Vessels

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SOURCE: CGD 79–023, 48 FR 51040, Nov. 4, 1983, unless otherwise noted.