

(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 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 millimeters (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

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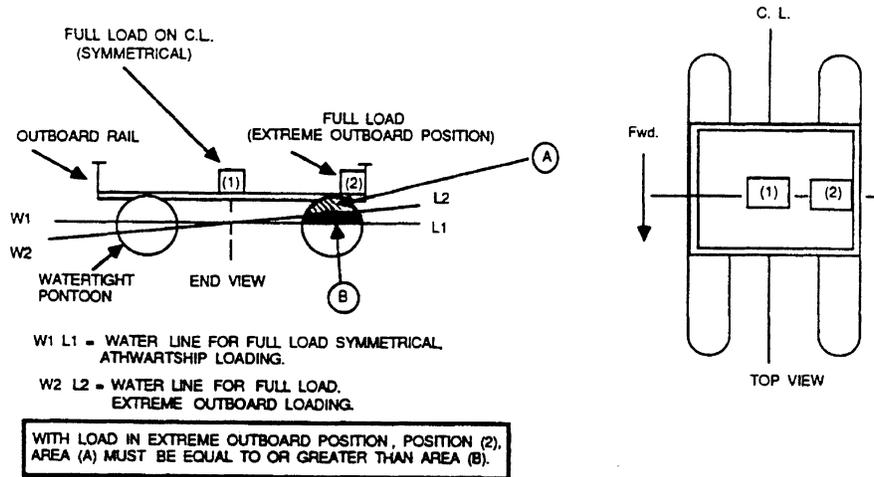
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freeboard, the remaining exposed cross sectional area of the pontoon on that side must be equal to or greater than

the cross sectional area submerged due to the load shift, as indicated in Figure 178.340(d)(1); and

FIGURE 178.340(d)(1)

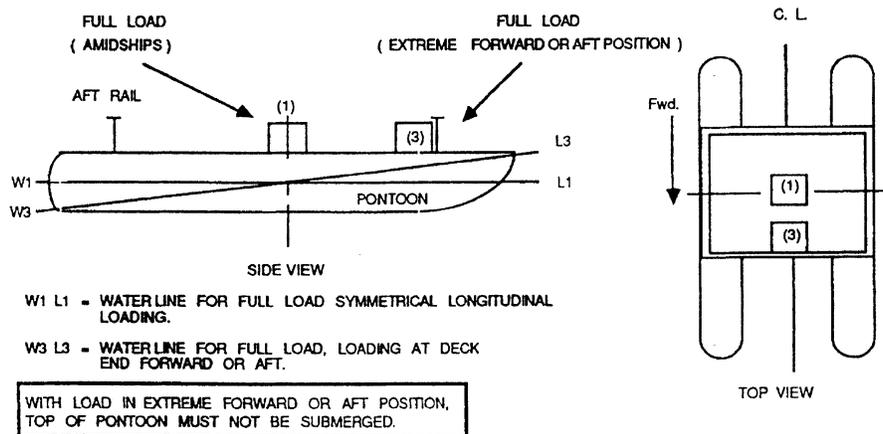
**TRANSVERSE STABILITY STANDARD**



(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