B_p = the maximum transverse distance in feet (meters) of a deck that is accessible to passengers;
A = Area, in square feet (square meters), of the projected lateral surface of the vessel above the waterline (including each projected area of the hull, superstructure, cargo, masts, area bounded by railings and canopies, but not protruding fixed objects such as antennas or running rigging).

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

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

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

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

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

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

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

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

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

(i) On exposed waters—

$i=f(2L–1.5L')/4L$

(ii) On protected or partially protected waters—

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

where:

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

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

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

(6) On a non-sailing flush deck catamaran that is propelled by mechanical means, not more than one-third of the freeboard or one-third of the draft, whichever is less, may be immersed.

(7) 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; USCG–2007–0030, 75 FR 78088, Dec. 14, 2010]

§ 178.340 Stability standards for pontoon vessels on protected waters.

(a) A pontoon vessel meeting the applicability requirements of § 178.320 of this part must be in the condition described in § 178.330(a) of this part when the PSST is performed, except that fuel, water and sewage tanks should either be empty or filled to 100 percent capacity, whichever is more conservative.

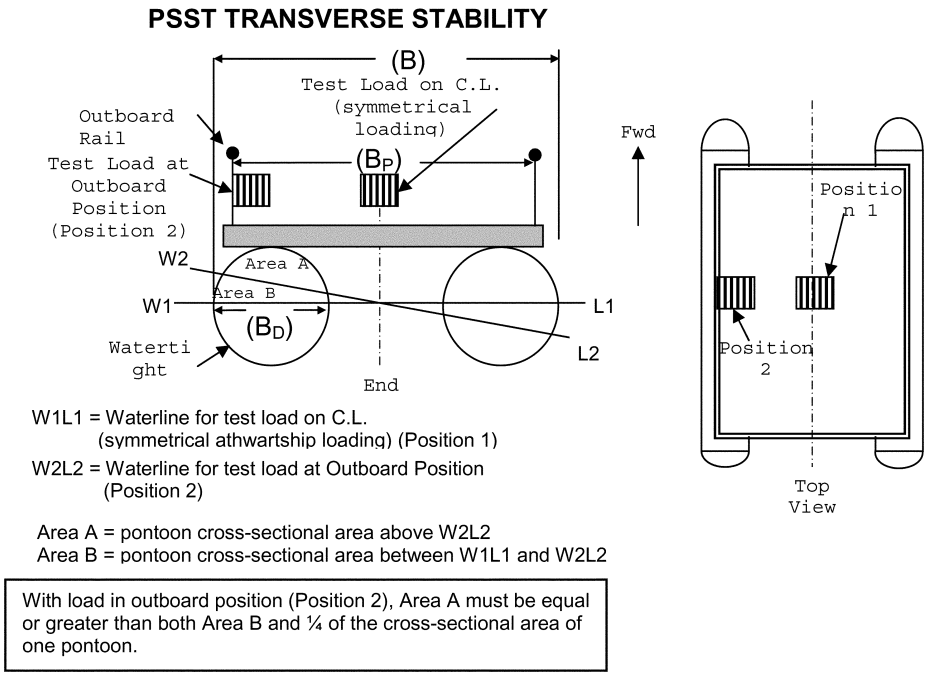
(b) A pontoon vessel must not exceed the limitations in paragraph (c) of this section when subjected to the greater of the following heeling moments:
$M_{pc} = [(W)(B_p - K)]/2$; or
$M_w = (P)(A)(H)$

Where:
M_{pc} = passenger and crew heeling moment in foot-pounds (kilogram-meters);
W = the total weight of passengers and crew aboard (total test weight) in pounds (kilograms);
B_p = the maximum transverse distance of the deck accessible to passengers in feet (meters);
K = 2.0 feet (0.61 meters);
M_w = Wind heeling moment in foot-pounds (kilogram-meters)
P = Wind pressure of 7.5 pounds/square foot (36.6 kilograms/square meter);
A = Area, in square feet (square meters), of the projected lateral surface of the vessel above the waterline (including each projected area of the pontoons, superstructure and area bounded by railings and structural canopies); and
H = Height, in feet (meters), of the center of area (A) above the waterline, measured up from the waterline.

(c) With the appropriate heeling moment applied to the most adversely affected side of the vessel, the remaining exposed cross-sectional area of the pontoon must be equal to or greater than both—

(1) The cross-sectional area submerged due to the load shift (for an example, see Figure 178.340(c)(1) of this section); and

Figure 178.340(c)(1)



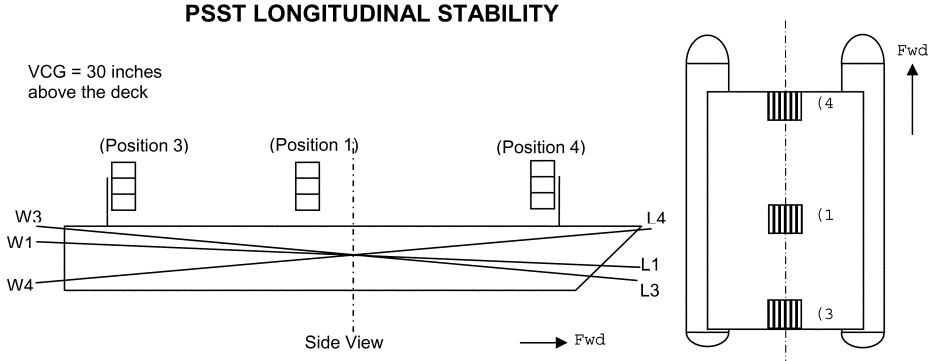
(2) One-quarter of the cross-sectional area on one pontoon.

(d) A pontoon vessel must also be tested to determine whether trimming moments will submerge the bow or stern of the buoyant hull. The top of any pontoon must not be submerged at any location, as indicated in Figure 178.340(d) of this section, with the total

test weight (W) located on the centerline and positioned as far forward or aft on the deck as practicable, whichever position results in the least freeboard.

Figure 178.340(d)

PSST LONGITUDINAL STABILITY



W1L1 = Waterline for test load on C.L. and distributed to reproduce operating trim of the vessel. (Position 1)
W3L3 = Test weight moved to the extreme aft position from Position 1. (Position 3)
W4L4 = Test weight moved to the extreme forward position from Position 1. (Position 4)

With the test load at the extreme aft position (Position 3) and at the extreme forward position (Position 4), the top of the pontoon must not be submerged.

[USCG–2007–0030, 75 FR 78089, Dec. 14, 2010]

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;