

§ 173.020 Intact stability standards: Counterballasted and non-counterballasted vessels.

(a) Except as provided in paragraph (c) of this section, each vessel that is not equipped to counter-ballast while lifting must be shown by design calculations to comply with this section in each condition of loading and operation and at each combination of hook load and crane radius.

(b) Each vessel must have a righting arm curve with the following characteristics:

(1) If the vessel operates in protected or partially protected waters, the area under the righting arm curve up to the smallest of the following angles must be at least 10 foot-degrees (3.05 meter-degrees):

(i) The angle corresponding to the maximum righting arm.

(ii) The downflooding angle.

(iii) 40 degrees.

(2) If the vessel operates in exposed waters, the area under the righting arm curve up to the smallest of the following angles must be at least 15 foot-degrees (4.57 meter-degrees):

(i) The angle corresponding to the maximum righting arm.

(ii) The downflooding angle.

(iii) 40 degrees.

(c) If the vessel's hull proportions fall within all three of the following limits, in lieu of complying with paragraph (b) of this section, the vessel owner may demonstrate in the presence of the OCMI that the vessel will not heel beyond the limits specified in paragraph (d) of this section:

(1) Beam to depth—3.40 to 4.75.

(2) Length to beam—3.20 to 4.50.

(3) Draft to depth—0.60 to 0.85.

(d) For the purpose of paragraph (c) of this section, the following limits of

heel apply with the vessel at its deepest operating draft:

(1) Protected and partially protected waters and Great Lakes in summer—heel to main deck immersion or bilge emergence, whichever occurs first.

(2) Exposed waters and Great Lakes in winter—heel permitted to one-half of the freeboard or one-half of the draft, whichever occurs first.

[CGD 79-023, 48 FR 51045, Nov. 4, 1983, as amended by CGD 85-080, 61 FR 945, Jan. 10, 1996]

§ 173.025 Additional intact stability standards: Counterballasted vessels.

(a) Each vessel equipped to counterballast while lifting must be shown by design calculations to be able to withstand the sudden loss of the hook load, in each condition of loading and operation and at each combination of hook load and crane radius.

(b) When doing the calculations required by this section, the hook load and counterballast heeling arms and vessel righting arms, as plotted on graph 173.025, must define areas that satisfy the following equation:

$$\text{Area II} > \text{Area I} + \text{K}$$

Where—

(1) K=O for operation on protected waters and 7 foot-degrees (2.13 meter-degrees) for operation on partially protected and exposed waters.

(2) Areas I and II are shown on graph 173.025.

(c) Each heeling arm curve must be defined by—

$$\text{HA} = \text{HAO} \cos (T)$$

Where—

HA=heeling arm.

HAO=heeling arm at 0 degrees of heel.

T=angle of heel.