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Subpart 151.10—Barge Hull Construction Requirements

§ 151.10–1 Barge hull classifications.

(a) Each barge constructed or converted in conformance with this subpart shall be assigned a hull type number.

(1) Effective dates for certain requirements:

(i) Barges constructed or converted between July 1, 1964, and June 1, 1970, in accordance with the construction requirements of §§ 32.63 and 98.03 of this chapter are considered to comply with the basic provisions of this subpart and will retain the hull type classification for the service for which they were originally approved. Changes in product endorsement will not be considered a change in service, except when a change to a product of higher specific gravity necessitates a reevaluation of the intact and damage stability requirements in subpart E of part 172 of this chapter.

(2) [Reserved]

(b) For this purpose the barge hull types shall be defined as follows:

(1) *Type I barge hull.* Barge hulls classed as Type I are those designed to carry products which require the maximum preventive measures to preclude the uncontrolled release of the cargo. These barges are required to meet:

(i) Standards of intact stability and a modified two compartment standard of subdivision and damage stability, as specified in subpart E of part 172 of this chapter; and

(ii) Hull structural requirements, including an assumed grounding condition.

(2) *Type I–S (special) barge hulls.* Type I–S (special) barge hulls are those constructed or converted for the carriage of chlorine in bulk prior to July 1, 1964, and modified to higher stability standards prior to July 1, 1968, but not meeting the requirements for full Type I classification.

(3) *Type II barge hull.* Barge hulls classed as Type II are those designed to carry products which require significant preventive measures to preclude the uncontrolled release of the cargo. These barges are required to meet:

(i) Standards of intact stability and a modified one compartment standard of subdivision and damage stability, as specified in subpart E of part 172 of this chapter; and

(ii) Hull structural requirements, including an assumed grounding condition.

(4) *Type III barge hull.* Barge hulls classed as Type III are those designed to carry products of sufficient hazard to require a moderate degree of control. These barges are required to meet:

(i) Standards of intact stability as specified in subpart E of part 172 of this chapter; and

(ii) Hull structural requirements.

[CGFR 70–10, 35 FR 3714, Feb. 25, 1970, as amended by CGD 79–023, 48 FR 51008, Nov. 4, 1983; CGD 88–100, 54 FR 40040, Sept. 29, 1989]

§ 151.10–5 Subdivision and stability.

Each barge must meet the applicable requirements in subchapter S of this chapter.

[CGD 70–023, 48 FR 51009, Nov. 4, 1983]

§ 151.10–15 Certificate endorsement.

(a)–(b) [Reserved]

(c) *Certificate endorsement.* The following information shall be submitted, and upon approval of calculations shall form part of the endorsement on the Certificate of Inspection:

(1) Limiting draft for each hull type service for which approval is requested.

(2) Maximum density (lb./gal.) and maximum cargo weight (tons) for each tank for which approval is requested. Their weights will normally reflect uniform loading except that for trim purposes the individual tank cargo weight may exceed the uniform loading tank cargo weight, corresponding to the barge fresh water deadweight at the limiting draft, by 5 percent. Where a greater degree of nonuniform loading

is desired, longitudinal strength calculations shall be submitted.

[CGFR 70–10, 35 FR 3714, Feb. 25, 1970, as amended by CGD 79–023, 48 FR 51009, Nov. 4, 1983]

§ 151.10–20 Hull construction.

(a) *Construction features.* (1) Each barge hull shall be constructed with a suitable bow form (length, shape, and height of headlog) to protect against diving at the maximum speed at which the barge is designed to be towed. In any integrated tow, only the lead barge need comply with this requirement.

(2) All ''open hopper'' type barges shall be provided with coamings around the hopper space and a 36–inch minimum height plowshare breakwater on the forward rake. The plowshare breakwater may be omitted, if it is demonstrated to the satisfaction of the Commandant that sufficient protection is achieved without it. Coamings shall have a minimum height of 36 inches forward and may be graduated to a minimum height of 24 inches at midlength and 18 inches thereafter. All hopper barges constructed with a weathertight rain shield over the hopper space are exempt from these requirements, except that they shall be provided with an 18–inch minimum coaming all around the hopper.

(3) All ''open hopper'' type barges modified for the carriage of chlorine in bulk shall be provided with 36–inch minimum height coamings around the hopper.

(4) All barges in ocean or coastwise service shall be provided with a structural deck and hatches in accordance with the applicable provisions of subchapter E of this chapter and the scantling requirements of the American Bureau of Shipping.

(b) *Hull structural requirements.* (1) All Types I, II, and III barges shall comply with the basic structural requirements of the American Bureau of Shipping for barges of the ordinary types and the applicable supplementary requirements of this section.

(2) Types I and II barges in inland service: A grounding condition shall be assumed where the forward rake bulkhead rests upon a pinnacle at the water surface. The maximum hull and tank bending moment and tank saddle reactions (if applicable) shall be determined. The hull bending stress shall not exceed the applicable limits of paragraphs (b)(2) (i), (ii), or (iii) of this section. The maximum tank bending moment and saddle reaction shall be used in the tank design calculations required by § 151.15–2(b)(3).

(i) Independent tanks supported by only two saddles do not contribute to the strength and stiffness of the barge hull. In such case, the hull stress shall not exceed either 50 percent of the minimum ultimate tensile strength of the material or 70 percent of the yield strength when specified, whichever is greater.

(ii) Independent tanks supported by three or more saddles contribute to the strength and stiffness of the hull. In such case, the hull stress shall not exceed the percentage stress values prescribed in § 151.10–20(b)(2)(i), multiplied by the quantity

$$(1.5 - SWT/UTS),$$

where *SWT* is the stress calculated without including the effect of the tanks, and *UTS* is the minimum ultimate tensile strength of the material. The value *SWT*, however, shall in no case be more than 75 percent of *UTS*.

(iii) Integral tanks may be considered as contributing to the strength and stiffness of the barge hull. The hull stresses for integral tank barges shall not exceed the percentage stress values prescribed in paragraph (b)(2)(i), of this section.

(3) Types I and II barges in ocean service:

(i) Independent tank barges with tanks supported by three or more saddles shall be subjected to a $0.6L^{0.6}$ trochoidal wave hogsag analysis to determine the maximum hull and tank bending moments and tank saddle reactions.

(ii) All independent tank barges, regardless of the number of saddle supports shall be subject to a still water bending analysis to determine the hull bending moment. For those barges with independent tanks supported by three or more saddles, this analysis shall consider tank-hull interaction so as to determine tank bending moments and saddle reactions.