

# MSC PLAN REVIEW GUIDELINE (PRG)



## REVIEW OF TANK BARGE GENERAL ARRANGEMENTS

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### Purpose

This Plan Review Guideline (PRG) provides guidance and information regarding the submission of General Arrangements plans for Oceangoing or Inland Tank Barges regulated under 46 CFR Subchapters D, I, and/or O.

### Contact Information

If you have any questions or comments concerning this document, please contact the Marine Safety Center (MSC) by e-mail or phone. Please refer to Procedure Number **C1-16**.

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## 1. Applicability

This Plan Review Guideline (PRG) is applicable to all Oceangoing and Inland Tank Barges regulated under 46 CFR Subchapters D, I, O, MARPOL, and/or the IBC Code.

Subchapter D applies to **manned and unmanned** barges, on any route, that carry cargoes listed in 46 CFR Table 30.25-1.

Subchapter I may apply to:

- (a) **Manned and unmanned** barges, on **any** route, that carry bulk liquid cargoes that are not flammable or combustible (see 151.01-10 for more information).

Subchapter O, **Part 151** applies to **unmanned, inland** tank barges that carry cargoes listed in 46 CFR Table 151.05.

- (a) If the cargoes to be carried **are flammable or combustible** as indicated by the fire protection requirement in the table (column “m”), then both Subchapters O and D apply (151.01-10(b)).
- (b) If the cargoes to be carried **are not flammable or combustible** as indicated by the fire protection requirement in the table (column “m”), then Subchapters O and D or O and I apply. The option for applying D or I is left up to the barge owner. The owner must request I/O certification on the Application for Inspection; otherwise the barge will be regulated under D/O (151.01-10(c)).
- (c) Part 151 may apply to **manned, inland** barges which carry a cargo listed in 46 CFR Table 151.05. For these barges, Commandant (CG-ENG-5) will consider the case individually and determine which subchapters apply (151.01-10(e)).

Subchapter O, **Part 153** (153.1(b)) applies to all **oceangoing barges** that carry in bulk a Category A, B, or C NLS cargo listed in Table 1 of Part 153 or allowed in a written permission under 46 CFR 153.900(d), unless:

- (a) The barge is carrying the cargo under 33 CFR part 151;
- (b) The barge is carrying the cargo in a portable tank under subpart 98.30 or 98.33; or
- (c) The barge’s Certificate of Inspection is endorsed for a limited short protected coastwise route and the barge is constructed and certificated primarily for service on an inland route.

MARPOL 73/38 (reference (a)) applicability varies by regulation, but in general, Annex I applies to oil barges of 150 gross tons and above and every other barge of 400 gross tons and above. Annex II applies to all barges certified to carry noxious liquid substances in bulk.

The IBC Code (reference (b)) applies to **manned and unmanned oceangoing** tank barges which are certificated for **international** voyages and which carry cargoes listed in Chapter 17 of the IBC Code.

Note: A seagoing barge is not subject to inspection if the vessel is unmanned and does not carry (1) a hazardous material as cargo; or (2) a flammable or combustible liquid, including oil, in bulk. In this case, “hazardous material” as cargo includes flammable/combustible liquids or substances, and “in bulk” means 250 barrels or more (46 USC 3302(m), 46 USC 2101(17), and MSM, Volume II, Chapter 4, Part E.1).

## **2. References**

- (a) International Convention for the Prevention of Pollution from Ships, 1973, and its Protocol of 1978 (MARPOL 73/78)
- (b) International Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk (IBC Code), Chapter 3
- (c) [33 CFR Part 155](#)
- (d) [33 CFR Part 157](#)
- (e) [46 CFR Subchapter D](#)
- (f) [46 CFR Subchapter O](#)
- (g) [46 CFR Subchapter I](#)
- (h) [Navigation and Vessel Inspection Circular \(NVIC\) 03-06](#)
- (i) [COMDT \(CG-CVC\) Policy Letter 16-04, "Conditional Occupancy of Unmanned Barges Forming Part of an Articulated Tug Barge \(ATB\) Combination"](#)
- (j) [Marine Safety Manual, Vol. II](#)
- (k) [Navigation and Vessel Inspection Circular \(NVIC\) 6-94](#)

## **3. Definitions**

### **Combustible Liquid (46 CFR 30.10-15):**

Any liquid having a flashpoint above 80°F (as determined from an open-cup tester, as used for test of burning oils).

### **Fair Weather Voyages (MSM, Volume IV, Chapter 6, Part F.3.i):**

Load lines may be authorized for unmanned inland barges on certain specific routes "in fair weather only." The route between St. Marks, Florida, and Carrabelle, Florida, may be considered an extension of lakes, bays, and sounds service for stability purposes. The barge will be restricted to unmanned fair weather voyages only, not to exceed 20 miles from shore. The Great Lakes route between Chicago, Illinois, and Gary or Burns Harbor, Indiana, may be considered an extension of river service for stability purposes. The barge will be restricted to unmanned fair weather voyages only, not more than 5 miles from a harbor of safe refuge. Hopper barges may be permitted to travel beyond Burns Harbor to Michigan City, Indiana, provided they are fitted with weathertight hatch covers. Barges built to inland structural standards may operate on these routes, within 5 miles from shore, without structural modification.

### **Flammable Liquid (46 CFR 30.10-22):**

Any liquid which gives off flammable vapors (as determined by flashpoint from an open-cup tester, as used for test of burning oils) at or below a temperature of 80°F.

### **Hazardous Material (46 CFR 150.115):**

- (a) A flammable or combustible liquid;
- (b) A material listed in Table 151.05, Table 1 of part 153, or Table 4 of part 154 of 46 CFR Subchapter O; or
- (c) A liquid, liquefied gas, or compressed gas listed in 49 CFR 172.101.

### **Headlog:**

The reinforced, vertical plate that connects the bow rake bottom to the rake deck of a barge or square-stemmed boat.

**Industrial Vessel (46 CFR 90.10-16):**

Every vessel which by reason of its special outfit, purpose, design, or function engages in certain industrial ventures. Included in this classification are such vessels as drill rigs, missile range ships, dredges, cable layers, derrick barges, pipe lay barges, construction and wrecking barges. Excluded from this classification are vessels carrying freight for hire or engaged in oceanography, limnology, or the fishing industry.

**Inland Routes:**

Inland routes include vessel service on lakes, bays, sounds, rivers, and certain coastwise routes, including “special service voyages” and “limited coastwise, fair weather only.” Operation on the Great Lakes is not considered an inland route, unless specified in fair weather definition.

**International Voyage (SOLAS Chapter I, Regulation 2(d)):**

A voyage from a country to which the present convention applies to a port outside such country, or conversely.

**Noxious Liquid Substance (46 CFR 153.2):**

- (a) Each substance listed in 33 CFR 151.47 or 33 CFR 151.49;
- (b) Each substance having an “A,” “B,” “C,” or “D” beside its name in the column headed “Pollution Category” in Table 1 of Part 153; and
- (c) Each substance that is identified as an NLS in a written permission issued under 46 CFR 153.900(c).

**Seagoing Barge (46 CFR 90.10-36):**

A nonself-propelled vessel of at least 100 gross tons making voyages beyond the Boundary Line (as defined in 46 CFR Part 7).

**Special Service Voyages (MSM, Volume IV, Chapter 6, Part F.3.g):**

This is a voyage between ports, in the trades, and under conditions of operation as specified in the Special Service Load Line regulations. Special service load lines and their certificates are valid only for coastwise (20 mile offshore limit) voyages within limited areas of trade as specified in 46 CFR Part 44. Special service freeboards are not applicable to the Great Lakes.

**Tank Vessel (46 USC 2101(49)):**

A vessel that is constructed or adapted to carry, or that carries, oil or hazardous material in bulk as cargo or cargo residue and that –

- (a) Is a vessel of the United States;
- (b) Operates on the navigable waters of the United States; or
- (c) Transfers oil or hazardous material in a port or place subject to the jurisdiction of the United States.

Additional definitions can be found here:

- (a) [46 CFR 30.10](#) (Subchapter D)
- (b) [46 CFR 90.10](#) (Subchapter I)
- (c) [46 CFR 151.03](#) (Subchapter O, Part 151)
- (d) [46 CFR 153.2](#) (Subchapter O, Part 153)

#### **4. General Guidance**

Using applicable portions of references (a) through (j), the submitter shall provide sufficient documentation and plans to indicate compliance with the requirements. The submission shall be made electronically to the above email address or, if paper, in triplicate to the MSC's address found on the above website. To facilitate plan review and project management, all plans and information specified in these guidelines should be submitted as one complete package through a single point of contact for the project. At a minimum, the submission should include:

- (a) Application for Inspection ([CG-3752](#) for existing vessels, [CG-3752A](#) for new construction).
- (b) State whether the barge will be manned or unmanned.
  - a. Reference (i) offers guidance and additional requirements for unmanned barges that are part of an Articulated Tug Barge Unit (ATB) which may be occasionally occupied by crewmembers from the towing vessel to perform non-navigational tasks.
  - b. Reference (j) offers guidance regarding permissive crewing on barges for which the owner/operator voluntarily elects to crew a barge not otherwise required to be crewed.
- (c) An inboard profile which shows the location of all watertight transverse bulkheads, decks, and openings in these decks and bulkheads.
- (d) An outboard profile which shows the profile of the vessel and indicates the load line, design waterline, draft marks, bulkheads, and freeboard decks.
- (e) A plan view of each deck which identifies all spaces. Openings that are considered downflooding points must be identified.
- (f) A reference which allows for the determination of the locations of all tanks, holds, watertight bulkheads, downflooding points, etc. for use in stability calculations.
- (g) A midship section drawing with dimensions, for use in structural calculations and to verify double hull requirements.
- (h) A statement clearly identifying what is desired from MSC.
- (i) Any special/unusual requests.

#### **5. Barges regulated under Subchapter D or Subchapters O and D**

##### **Inland Barges:**

- (a) A double bottom shall be fitted in accordance with 33 CFR 157.10d(d)(2) [2 foot requirement].
- (b) A double side shall be fitted as follows (IAW 46 CFR 151.15-3(d) and 33 CFR 157.10d(d)(1)):

- a. Type I hull:
    - i. 4 feet from the side shell and box end, and
    - ii. 25 feet from the headlog at the bow, for lead barge.
  - b. Type II hull:
    - i. 3 feet from the side shell and box end, and
    - ii. 25 feet from the headlog at the bow, for lead barge.
  - c. Type III hull and all others:
    - i. 2 feet from the side shell.
- (c) As per 33 CFR 157.10d(e), oil cannot be carried forward of the collision bulkhead.
- a. If there is no collision bulkhead, oil cannot be carried forward of:
    - i. For a barge of less than 10,000 DWT, the lesser of 25 ft or 5% of the barge length but not less than 2 ft aft of the headlog.
    - ii. On each vessel which operates exclusively as a box or trail barge, 61 cm (2 ft) aft of the headlog.
    - iii. Otherwise, the lesser of 32.8ft or 5% of the barge length, but not less than 39in aft of the headlog.
- (d) The galleys, living quarters, navigation spaces, general cargo spaces, boiler rooms, and enclosed spaces where sources of vapor ignition are normally present shall be segregated from cargo tanks by cofferdams, pump rooms, or tanks (46 CFR 32.60-10).
- (e) Deck coamings and enclosed areas shall be constructed in accordance with 33 CFR 155.310.
- (f) Slop tanks must be provided which meet the requirements of 33 CFR 157.15. Note that 33 CFR 157.08(g) exempts tank barges that cannot ballast or wash cargo tanks underway from the requirement to have slop tanks.
- (g) Cargo tank spaces shall extend to the main deck, with hatches and vents located on the weather deck (46 CFR 32.60-10(b)).
- (h) Pump rooms must be isolated from sources of vapor by gastight bulkheads (46 CFR 32.60-20).
- (i) **Subchapters D and O:** Each tank must be fitted with an access opening, and each access must be sized and located according to the requirements of 46 CFR 151.15-3(d)(3).

### **Oceangoing Barges:**

- (a) A double bottom shall be fitted in accordance with 33 CFR 157.10d(c)(2) and Figure 157.10d(c):
  - a. 5,000 DWT and above:
    - i. B/15 from the bottom of the tanks to the bottom shell plating or 2.0 meters (79 in), whichever is less, but not less than 1.0 meter (39 inches).
  - b. Less than 5,000 DWT:
    - i. B/15 from the bottom of the tanks to the bottom shell plating, but not less than 0.76 meters (30 in).

- c. A barge that satisfies the requirements in 33 CFR 157.10d(c)(2) also meets the double bottom requirements in MARPOL Annex I and/or IBC Code 2.6.
- (b) A double side shall be fitted as follows (IAW 46 CFR 153.230-232, 33 CFR 157.10d, MAPROL Annex I, and IBC Code):
- a. **D or D/O – Domestic Routes** (33 CFR 157.10d(c)(1)):
    - i. 5,000 DWT and above:
      - 1.  $0.5 + (DWT/20,000)$  meters or 2.0 meters (79 in), whichever is less, but not less than 1.0 meter (39 in).
    - ii. Less than 5,000 DWT:
      - 1.  $0.4 + ((2.4 * DWT)/20,000)$  meters, but not less than 0.76 meters (30 in).
  - b. **D – International Routes** (MARPOL Annex I / Regulation 12A):
    - i. Oil fuel capacity of over 5,000 m<sup>3</sup>:
      - 1.  $0.5 + (DWT/20,000)$  meters or 2.0 meters (79 in), whichever is less, but not less than 1.0 meter (39 in).
    - ii. Oil fuel capacity of 600 m<sup>3</sup> or more but less than 5,000 m<sup>3</sup>:
      - 1.  $0.4 + ((2.4 * DWT)/20,000)$  meters, but not less than 0.76 meters (30 in).
  - c. **D/O – International Routes** (33 CFR 157.10d(c)(1) and IBC Code 2.6):
    - i. Type I hull:
      - 1. IAW 33 CFR 157.10d(c)(1) OR B/5, whichever is GREATER, but not less than 1.0 meter (if 5,000 DWT and above) or 0.76 meter (if less than 5,000 DWT) from the side shell.
    - ii. Type II/III hulls:
      - 1. IAW 33 CFR 157.10d(c)(1), but not less than 1.0 meter (if 5,000 DWT and above) or 0.76 meter (if less than 5,000 DWT) from the side shell from the side shell.
- (c) Size and arrangement of cargo tanks:
- a. If delivered **on or after 1 January 2010** and requiring an IOPP certificate, vessel must meet the requirements in MARPOL Annex I, regulation 23 (Accidental Oil Outflow Performance), as per 33 CFR 157.20. Hypothetical oil outflow will no longer be applicable.
  - b. If delivered **before 1 January 2010**:
    - i. For a barge operated only on **domestic** voyages, use the criteria in 33 CFR 157.19(c).
    - ii. For a barge operated on an **international** voyage, use the criteria in MARPOL Annex I, regulations 23, 24, 25 & 26.
- (d) As per 33 CFR 157.10d(e), oil cannot be carried forward of the collision bulkhead.
- a. If there is no collision bulkhead, oil cannot be carried forward of:
    - i. The lesser of 32.8ft or 5% of the barge length, but not less than 39 inches aft of the headlog.
- (e) Deck coamings and enclosed areas shall be constructed in accordance with 33 CFR 155.310.



- (f) Slop tanks must be provided which meet the requirements of 33 CFR 157.15 and, if on an international route, MARPOL Annex I, regulation 29. Note the following exceptions:
- a. Domestic route: 33 CFR 157.08(g) exempts tank barges that cannot ballast or wash cargo tanks underway.
  - b. International route: Reference (k) allows barges that cannot ballast or wash cargo tanks while enroute to retain all cargo residues, clean ballast, and dirty ballast onboard until they can be discharged to reception facilities as an equivalent arrangement to the slop tank requirements in MARPOL. In order to be eligible for this equivalency, the barge must be:
    - i. Unmanned (or permissively manned),
    - ii. Have no installed system for cleaning cargo tanks, AND
    - iii. Be incapable of ballasting cargo tanks through a fixed piping system (if an IOPP certificate is issued) or have suitably sealed all valves that allow ballasting of the cargo tanks through a fixed piping system (if no IOPP certificate will be issued) (Paragraph 6 and Paragraph 12.b).
- (g) Cargo tank spaces shall extend to the main deck, with hatches and vents located on the weather deck (46 CFR 32.60-10(b)).
- (h) Pump rooms must be isolated from sources of vapor by gastight bulkheads (46 CFR 32.60-20).
- (i) **Subchapters D and O:** Openings to accommodation, service or control spaces must meet 46 CFR 153.201.
- (j) **Subchapters D and O:** Each cargo containment system:
  - a. Must be forward of any accommodation spaces (46 CFR 153.234(a)), and
  - b. Must be located at least 0.05L aft of the forward perpendicular, but in no case forward of a collision bulkhead or less than 39 inches aft of the headlog (46 CFR 153.234(b) and 33 CFR 157.10d(e)).
  - c. Each tank must be fitted with an access opening, and each access must be sized and located according to the requirements of 46 CFR 153.217; .219; .254, and .256.
- (k) **If the IBC Code *does not* apply (domestic route):** The galleys, living quarters, navigation spaces, general cargo spaces, boiler rooms, and enclosed spaces where sources of vapor ignition are normally present shall be segregated from cargo tanks by cofferdams, pump rooms, or tanks (46 CFR 32.60-10).
- (l) **If the IBC code *does* apply (international route):** No accommodation or service spaces or control stations shall be located within the cargo area except over a cargo pump-room recess or pump-room recess that complies with SOLAS regulations II-2/4.5.1 to 4.5.2.4 and no cargo or slop tank shall be aft of the forward end of any accommodation (IBC Code 3.2.1).

#### **MANNED Barges (Additional Requirements):**

- (a) Two means of escape must be provided from accommodations, spaces normally manned, and machinery spaces, as required by 46 CFR 32.02-1.
- (b) Sleeping accommodations must meet the requirements listed in 46 CFR 32.40-20.
- (c) Each unit must have at least 1 toilet, 1 washbasin, and 1 shower or bathtub for every 8 persons who occupy sleeping spaces that do not have private or semi-private facilities attached. All facilities shall be constructed in accordance with 46 CFR 32.40-25.
- (d) Guardrails or bulwarks shall be constructed in accordance with 46 CFR 32.02-10.
- (e) Messrooms shall be constructed in accordance with 46 CFR 32.40-30.
- (f) Each unit carrying twelve or more persons on a voyage of more than 3 days requires a hospital space or a designated treatment or isolation room, in accordance with 46 CFR 32.40-35.
- (g) Laundry, recreation, and open deck spaces shall be provided in accordance with 46 CFR 32.40-40.
- (h) The crew accommodations must be consistent with the principles underlying the requirements for crew accommodations of tankships of 100 gross tons or more (46 CFR 32.40-60).
  - a. Locating the accommodation spaces aft of the cargo area, as spelled out in 46 CFR 32.56-5(b)(1), is a fundamental principle of tankship design, and is appropriate for application to manned tank barges.
  - b. Alternately, the accommodation spaces may be located forward of the cargo area if the requirements of 32.56-5(d) are met.

## **6. Barges regulated under Subchapters O and I**

### **Inland Barges:**

- (a) The double bottom height will be controlled by the ability of the submitter to show that the vessel can survive the applicable damage stability requirements. If fitted, a double bottom must have an inspection clearance of at least 15 inches in accordance with 46 CFR 151.15-3(d)(2).
- (b) A double side shall be fitted as follows: (IAW 46 CFR 151.15-3(d)):
  - a. Type I hull:
    - i. 4 feet from the side shell and box end, and
    - ii. 25 feet from the headlog at the bow, for lead barge.
  - b. Type II hull:
    - i. 3 feet from the side shell and box end, and
    - ii. 25 feet from the headlog at the bow, for lead barge.
  - c. Type III hull:
    - i. No double side requirement.

- (c) Deck coamings and enclosed areas shall be constructed in accordance with 33 CFR 155.310.
- (d) No oil or hazmat may be carried forward of the collision bulkhead (33 CFR 155.470).
- (e) Each tank must be fitted with an access opening, and each access must be sized and located according to the requirements of 46 CFR 151.15-3(d)(3).

**Oceangoing Barges:**

**(a) If the IBC Code *does not* apply:**

- a. The double bottom height will be controlled by the ability of the submitter to show that the vessel can survive the applicable damage stability requirements. If fitted, a double bottom must have an inspection clearance of at least 15 inches in accordance with 46 CFR 151.15-3(d)(2).
- b. A double side shall be fitted as follows: (IAW 46 CFR 151.15-3(d)):
  - i. Type I hull:
    - 1. 4 feet from the side shell and box end, and
    - 2. 25 feet from the headlog at the bow, for lead barge.
  - ii. Type II hull:
    - 1. 3 feet from the side shell and box end, and
    - 2. 25 feet from the headlog at the bow, for lead barge.
  - iii. Type III hull:
    - 1. No double side requirement.

**(b) If the IBC Code *does* apply:**

- a. A double bottom shall be fitted as follows (IAW IBC Code 2.6):
  - i. Type I/II hulls:
    - 1. B/15 from the bottom shell plating, but never less than 76 cm.
  - ii. Type III hulls:
    - 1. No double bottom requirement.
- b. A double side shall be fitted as follows (IAW IBC Code 2.6):
  - i. Type I hulls:
    - 1. B/5 from the side shell plating.
  - ii. Type II hulls:
    - 1. 76 cm (29.9 in) from the side shell plating.
  - iii. Type III hulls:
    - 1. No double side requirement.

- (c) Deck coamings and enclosed areas shall be constructed in accordance with 33 CFR 155.310.
- (d) No oil or hazmat may be carried forward of the collision bulkhead (33 CFR 155.470).

- (e) Each tank must be fitted with an access opening, and each access must be sized and located according to the requirements of 46 CFR 153.217; .219; .254, and .256.
- (f) Openings to accommodation, service or control spaces must meet 46 CFR 153.201.

**MANNED Barges (Additional Requirements):**

- (a) Two means of escape must be provided from accommodations, spaces normally manned, and machinery spaces, as required by 46 CFR 92.10-5.
- (b) No sleeping space may berth more than 4 persons (46 CFR 92.20-20(b)).
- (c) Each licensed officer shall be provided with a separate stateroom, where practicable (46 CFR 92.20-20(a)).
- (d) Sizing, spacing and lockers must be provided (46 CFR 92.20-20(c)-(e)).
- (e) Each unit carrying twelve or more persons on a voyage of more than 3 days requires a hospital space or a designated treatment or isolation room, in accordance with 46 CFR 92.20-35.
- (f) Guardrails or bulwarks shall be constructed in accordance with 46 CFR 92.25.
- (g) Each unit must have at least 1 toilet, 1 washbasin, and 1 shower or bathtub for every 8 persons who occupy sleeping spaces that do not have private or semi-private facilities attached. All facilities shall be constructed in accordance with 46 CFR 92.20-25.
- (h) Messrooms shall be constructed in accordance with 46 CFR 92.20-30.
- (i) Laundry, recreation, and open deck spaces shall be provided in accordance with 46 CFR 92.20-40.

**8. Disclaimer**

This guidance is not a substitute for applicable legal requirements, nor is it itself a rule. It is not intended to nor does it impose legally-binding requirements on any party. It represents the Coast Guard's current thinking on this topic and may assist industry, mariners, the general public, and the Coast Guard, as well as other federal and state regulators, in applying statutory and regulatory requirements. You can use an alternative approach for complying with these requirements if the approach satisfies the requirements of the applicable statutes and regulations. If you want to discuss an alternative, you may contact MSC, the unit responsible for implementing this guidance.