

# MSC Guidelines for Review of Oceangoing Tank Barge Stability (intact/damage), Lightship, and Special Loading Authorization

Procedure Number: T1-15

Revision Date: 07/01/03

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## References

- a. 46 CFR 170, Stability Requirements for all Inspected Vessels
  - b. NVIC 17-91, Guidelines for Conducting Stability Tests
  - c. ASTM F 1321-92, Standard Guide for Conducting a Stability Test (Inclining and Lightweight Survey) to Determine the Light Ship Displacement and Centers of Gravity of a Vessel
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## Disclaimer

These guidelines were developed by the Marine Safety Center staff as an aid in the preparation and review of vessel plans and submissions. They were developed to supplement existing guidance. They are not intended to substitute or replace laws, regulations, or other official Coast Guard policy documents. The responsibility to demonstrate compliance with all applicable laws and regulations still rests with the plan submitter. The Coast Guard and the U. S. Department of Homeland Security expressly disclaim liability resulting from the use of this document.

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## Contact Information

If you have any questions or comments concerning this document, please contact the Marine Safety Center by e-mail or phone. Please refer to the Procedure Number: **T1-15**

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## General Review Guidance

- If the vessel is new and not a sister vessel, has the Application for Inspection been submitted? In general, no plan review will occur until receipt of a copy of the Application.
  - Is it clearly stated what is desired from the MSC? Are all plans requiring Coast Guard review and/or approval submitted in triplicate? Are there any special or unusual requests involved?
  - Verify Lightweight Characteristics utilizing one of the following methods:
    - 1) Does a sister vessel, with known characteristics, exist?
    - 2) Has a detailed estimate of the characteristics been provided by the owner/designer?
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- 3) Has an approved procedure and subsequent deadweight/stability test been performed in accordance with (Subpart F) of reference (a) and references (b), and (c)
  
- Ensure that the following drawings (items) are submitted:
  - General Arrangements
  - Lines, offsets, or computer disk with hull model
  - Tank Capacity Tables\Plan
  - Hydrostatic Tables
  - Intact Stability calculations
  - Damage Stability calculations, as applicable
  
- Use the attached flowchart to determine what stability criteria, requirements 1 through 6, are applicable for the subject barge.
  
- If **requirement 1** is applicable,
  - Verify minimum GM is achieved in each condition of loading, 46 CFR 170.170.
  - Verify the character of damage applicable for the hull type, 46 CFR 172.133.
  - Verify the extent of damage, 46 CFR 172.135.
  - Verify the permeability of spaces, 46 CFR 172.140.
  - Verify the survival conditions are achieved, 46 CFR 172.150.
  
- If **requirement 2** is applicable,
  - Verify that the intact transverse stability requirements have been met, 46 CFR 172.090.
  - Verify that the intact longitudinal stability requirements have been met, 46 CFR 172.095.
  - Verify that the watertight integrity is maintained, 46 CFR 172.095. (Type I and II only)
  - Verify the character of damage applicable for the hull type, 46 CFR 172.104. (Type I and II only)
  - Verify the extent of damage, 46 CFR 172.105. (Type I and II only)
  - Verify the survival conditions are achieved, 46 CFR 172.110. (Type I and II only)
  
- If **requirement 3** is applicable,
  - Verify that the intact transverse stability requirements have been met, 46 CFR 172.090.

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- Verify that the intact longitudinal stability requirements have been met, 46 CFR 172.095.
- If **requirement 4** is applicable,
  - Verify minimum GM is achieved in each condition of loading, 46 CFR 170.170.
  - Verify the character of damage, 46 CFR 172.065(d).
  - Verify the extent of damage, 46 CFR 172.065(e).
  - Verify the permeability of spaces, 46 CFR 172.065(f).  
Note: The requirements above are the same as those contained in 33 CFR 157 Appendix A and B.
  - Verify the survival conditions are achieved, 46 CFR 172.065(g).  
Note: The requirements above are the same as those contained in 33 CFR 157 Appendix A and B.
  - Verify the buoyancy of the superstructure, if applicable, 46 CFR 172.065(h).  
Note: The requirements above are the same as those contained in 33 CFR 157 Appendix A and B.
  - Verify intact stability if 5,000 DWT or greater, 46 CFR 172.070
- If **requirement 5** is applicable,
  - Verify minimum GM is achieved in each condition of loading, 46 CFR 170.170.
  - Verify the hull type and whether vessel uses an open hopper.
  - If credit is given for reserve buoyancy ensure that it is given per 46 CFR 172.050(d)
  - Verify the extent of damage for barge not using open hopper, 46 CFR 172.050(f).
  - Verify the location of applied damage, 46 CFR 172.050(e)
  - Verify that 2 inches (50mm) of GM is achieved, 46 CFR 172.050 (c) and (e).
- If **requirement 6** is applicable,
  - There are **no** stability requirements.
- Per 46 CFR 31.10-32, if the barge was constructed after September 6, 1977 and is greater than 300 feet in length, a loading manual must be submitted in accordance with 46 CFR 42.15-1(a) or 45.105(a).

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- ❑ If a barge is seeking a one-time voyage Special Loading Authorization (SLA), ensure that calculations are submitted that demonstrate compliance with the applicable requirements.
  - ❑ The MSC may construct a detailed computer model from the lines, offsets, or provided disk and independently verify the stability of the vessel using the computer model.
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## Definitions

Downflooding Point: The lowest opening on a vessel that allows the entry of seawater into the hull or superstructure of an undamaged vessel due to heel, trim, or submergence of the vessel.

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## Attachment

- (1) Flow Chart - Oceangoing Tank Barge Stability
- (2) Tank Vessel Stability Matrix