

MSC Guidelines for Review of Tankship Stability and Hypothetical Oil Outflow

Procedure Number: T1-21

Revision Date: 11/29/99

References

- a. 46 CFR 170, Subpart F, Determination of Lightweight Displacement and Centers of Gravity
 - 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
 - d. 46 CFR 170, Subpart E, Weather Criteria
 - e. International Convention for the Prevention of Pollution from Ships, 1973, and its Protocol of 1978 (MARPOL 73/78)
 - f. International Convention for the Safety of Life at Sea, 1974, and its Protocol of 1978 (SOLAS)
 - g. 46 CFR 172, Subpart D, Special Rules Pertaining to a Vessel That Carries a Cargo Regulated Under 33 CFR Part 157
 - h. 33 CFR 157.21, Subdivision and Stability
 - i. 46 CFR 173, Subpart B, Lifting
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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 guidance. 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 Transportation expressly disclaim liability resulting from the use of this document.

Contact Information

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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?
- Is the vessel being reviewed under NVIC 3-97? If yes, then MSC review of stability items is not required.
- Verify Lightweight Characteristics utilizing one of the following methods:
 - 1) Does a sister vessel, with known characteristics, exist?
 - 2) Has an approved procedure and subsequent stability test been performed in accordance with references (a), (b), and (c)?
- Ensure the following drawings (items) are submitted:
 - General Arrangements
 - Lines, offsets, or computer disk with hull model
 - Hydrostatic Tables
 - Tank Capacity Tables\Plan
 - Ullage & Sounding Tables
 - Intact calculations
 - Damage Stability calculations
 - Lifting calculations
 - Trim and Stability Booklet
- Verify compliance with the intact stability requirements defined in reference (d). Ensure actual GM is larger than required GM in all loading conditions. Intact stability requirements incorporating minimum GM and righting energy criteria are under development as Regulation 25A of reference (e).

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- A tankship may either use MARPOL or SOLAS regulations for demonstrating compliance with international regulations. For stability calculations performed in accordance with Chapter II-1, Part B-1 of reference (f), verify compliance with all applicable requirements. (Note: The SOLAS regulations require calculation of indices and factors instead of the righting arm and energy criteria traditionally applied to vessels.)
- Verify that the proper extents of damage are being used in the calculations. For a tanker operated only on domestic voyages, use the criteria in 46 CFR 172.065(e) **or** 33 CFR 157, Appendix B.3(b), references (g) and (h). For a tanker operated on international voyages, use the criteria in Regulation 25(2) of reference (e). (Note: The requirements in 46 CFR are the same as those in 33 CFR. The only difference between U.S. domestic and international criteria for extents is the transverse bottom damage extent for parts of the ship aft of 0.3L.)
- Ensure the survival conditions have been met. For a tanker operated only on domestic voyages, use the criteria in 46 CFR 172.065 **or** 33 CFR 157.21. For a tanker operated on international voyages, use the criteria in Regulation 25(3) of reference (e). (Note: The requirements in 46 CFR are the same as those in 33 CFR. The only difference between U.S. and international criteria for survival conditions is that MARPOL has a righting energy requirement.)
- Verify compliance with the hypothetical oil outflow calculations. For a tanker operated only on domestic voyages, use the criteria in 33 CFR 157.21, Appendix A.3. For a tanker operated on international voyages, use the criteria in Regulation 22 and 23 of reference (e). (Note: The domestic and international criteria are the same.)
- Verify compliance with the size and arrangement of cargo tanks. For a tanker operated only on domestic voyages, use the criteria in 33 CFR 157.19, Appendix A.4-5. For a tanker operated on international voyages, use the criteria in Regulation 24 of reference (e). (Note: The domestic and international criteria are the same.)
- Check the location of downflooding and ensure this is taken into account for compliance with the applicable stability criteria.

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- If the vessel is carrying a crane, ensure compliance with reference (i).
 - Construct a full HECSALV or GHS model from the lines, offsets, or provided disk.
 - Verify the stability of the vessel for several representative loading conditions, using the computer model and the criteria specified above.
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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.