

MSC Guidelines for the Review of Tankship Stability and Hypothetical Oil Outflow

Procedure Number: C1-21

Revision Date: January 23, 2012



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Purpose

To establish a process for reviewing stability calculations for tankships operating on domestic and/ or international voyages, and regulated under 46 CFR Subchapter D.

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 F1321-92, Standard Guide for Conducting a Stability Test (inclining and Lightweight Survey) to Determine the Lightship Displacement and Centers of Gravity of a Vessel
 - d. 46 CFR 170, Subpart E, Weather Criteria
 - e. Annex I of the 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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Contact Information

If you have any questions or comments concerning this document, please contact the Marine Safety Center (MSC) by email or phone. Please refer to the Procedure Number C1-21.

Email: MSC@uscg.mil

Phone: 202-475-3403

Website: <http://homeport.uscg.mil/msc>

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Responsibilities

Using applicable portions of references (a) through (i), the submitter shall provide sufficient documentation and plans to indicate compliance with the applicable 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.

General 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.
- ❑ It is 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:
 - Does a sister vessel, with known characteristics, exist?
 - 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). Verify compliance with references (a), (g), and (h), also. Ensure actual GM is larger than required GM in all loading conditions.

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Intact stability requirements incorporating minimum GM and righting energy criteria are listed in Regulation 27 of reference (e).

- ❑ For tankships on international voyages, references (e) and (f) shall be applied 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. domestic 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.)

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- ❑ Check the location of downflooding and ensure this is taken into account for compliance with the applicable stability criteria.
 - ❑ If the vessel is carrying a crane, ensure compliance with reference (i).
 - ❑ Construct a full GHS or HECSALV model from the lines, offsets, or provide a computer disk (for MSC staff engineers). A submitted computer generated hull model will expedite MSC's review (for industry submitters).
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Definitions

Downflooding Point: The lowest point 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.

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 the MSC, the unit responsible for implementing this guidance.