

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

Procedure Number: C1-15

Revision Date: May 13, 2016

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Purpose:

To establish a process for reviewing stability calculations for an Oceangoing Tank Barge regulated under 46 CFR Subchapters D, I, O, and/or MARPOL Annex I or II.

References:

- a. Marine Safety Manual (MSM), Vol IV
 - b. NVIC 17-91, Guidelines for Conducting Stability Tests
 - c. ASTM F 1321, Standard Guide for Conducting a Stability Test (Lightweight Survey and Inclining Experiment) to Determine the Light Ship Displacement and Centers of Gravity of a Vessel
 - d. G-MSE-2, 9079/10, "Intact Stability Requirements for Tank Barges greater than 5000 DWT on Ocean Routes," dated November 26, 2003
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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, and refer to Plan Review Guide Number C1-15.

Email: MSC@uscg.mil

Phone: 202-795-6731

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

Responsibilities:

The submitter shall provide sufficient documentation and plans to indicate compliance with the applicable requirements from 46 CFR Subchapters D, I, O, S, and/or MARPOL Annex I or II. 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.

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General Review Procedure:

- This Plan Review Guide is applicable to barges designed to operate on oceangoing routes. The definitions section at the end of this guide contains further information regarding the specific meaning of oceangoing routes.
- If the vessel is new and not a sister vessel, has the Application for Inspection been submitted? In general, plan review may not occur until a copy of the Application is received.
- Does the submission include all necessary information to support compliance with the applicable requirements? At a minimum, submissions should include the following:
 - General Arrangements
 - Lines, offsets, or computer model
 - Tank Capacity Tables/Plan
 - Hydrostatic Tables
 - Stability calculations (intact and damage, as applicable)
- Does the submission clearly state what is desired from MSC? Are all plans requiring Coast Guard review and/or approval submitted in triplicate (if submittal is in hard copy)? Are there any special or unusual requests involved?

Lightship Verification:

- Verify that lightship characteristics were (or are to be) determined using one of the following methods:
 - Acceptance as a sister vessel with known characteristics (reference (a), Section 6.D.2)
 - Deadweight survey combined with a conservatively assumed vertical center of gravity (VCG), or an inclining test (references (b) and (c))
 - In accordance with 46 CFR 170.085, a written stability test procedure must be sent to the MSC at least two weeks before the stability test. Reference (c) provides guidance on the required elements for the stability test procedure. The procedure shall be approved by the MSC prior conducting the test or survey.
 - In accordance with 46 CFR 170.175(b), arrangements should be made with the OCMI to have an acceptable Coast Guard representative to witness the stability test.

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Applicable Stability Requirements:

Use the flowchart found in attachment (1) to determine the applicable stability requirements. Every intended loading condition must be evaluated against the applicable criteria.

- If **requirement 1** is applicable:
 - Verify that the 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 that 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 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 that 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.
- If **requirement 4** is applicable:
 - Verify that the 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 that 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.
- If **requirement 5** is applicable:
 - Verify that the minimum GM is achieved in each condition of loading, 46 CFR 170.170.
 - Verify the hull type and whether the vessel uses an open hopper.
 - Verify the extent of damage if the barge does not use an 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 and no review is necessary.

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Additional 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).
- **For all oceangoing tank barges that carry oil and are greater than 5,000 Deadweight Tons:** the stability criteria in reference (d) is accepted as equivalent to the criteria found in MARPOL Annex I Regulation 25A, specifically:
 - GM must be greater than 0.49 ft (0.15 meters);
 - Max righting arm must occur at an angle of heel not less than 15 degrees;
 - A righting arm of at least 0.66 ft (0.20 meters) must occur at an angle of heel equal to or greater than 30 degrees;
 - The area under each righting arm curve must be at least 16.9 ft-degrees (5.15 meter-degrees) up to an angle of heel of 40 degrees or the downflooding angle, whichever is less;
 - The area under each righting arm curve between the angles of 30 and 40 degrees, or between 30 degrees and the downflooding angle if it is less than 40 degrees, must be at least 5.6 ft-degrees (1.72 meter-degrees); and
 - The area under each righting arm curve up to the angle of maximum righting arm must not be less than the area determined by the following equation:

$$A = 10.3 + 0.187 (30 - Y) \text{ foot-degrees}$$

$$A = 3.15 + 0.057 (30 - Y) \text{ meter-degrees}$$

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.
Great Lakes:	See 46 CFR 30.10-33
Ocean:	See 46 CFR 30.10-45
Coastwise:	See 46 CFR 30.10-11
Special service voyages:	See MSM, Volume IV, Chapter 6, Section F.3.g
Oceangoing:	See 33 CFR 151.05

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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 guidance 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.

Attachment

(1) Flow Chart for Oceangoing Tank Barge Stability

Attachment (1): Flow Chart for Oceangoing Tank Barge Stability

