

MSC Guidelines for Submission of Stability Test Procedures

Procedure Number: H2-01

Revision Date: 28SEP11



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Purpose

The purpose of this Plan Review Guideline is to provide the submitter with general guidance and information for the conducting and submission of Stability Test Procedures.

References

- a. [46 CFR 170, Subpart F](#): “Determination of Lightweight Displacement and Centers of Gravity”
 - b. [Navigation and Vessel Inspection Circular \(NVIC\) No. 17-91](#), “Guidelines for Conducting Stability Tests”
 - c. ASTM Standard Guide F1321-92 “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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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 **H2-01**.

Email: MSC@uscg.mil

Phone: 202-475-3401

Website: <http://www.uscg.mil/hq/msc/>

General Review Guidance for both Deadweight Surveys & Inclining Experiments

- Trim should be less than 1% LBP, unless the hydrostatic properties for the surveyed condition include the actual trimmed amount.
- The vessel should be moored as described in reference (c).
- Ensure the vessel is 98% or more complete at the time of the survey.
- Ensure the initial heel will not exceed ½ degree.
- All empty tanks and voids shall be open and ready for inspection and have a gas free certificate.

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- ❑ A hydrometer of appropriate scale should be available to measure the specific gravity of the water at the time of the inclining.
 - ❑ The vessel's downflooding points must be identified and their location clearly delineated in the stability test results submittal.
 - ❑ Ensure that 5 separate and widely distributed freeboard readings will be taken on each side of the vessel and that they are plotted on a profile view of the vessel at the time of the survey.
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Specific Guidance for Deadweight Surveys

- ❑ Ensure the requirements of [46 CFR 170.185\(g\)](#) are included in the submission:
 - a. Identification of the vessel to be tested.
 - b. Date and location of the test.
 - c. Approximate draft and trim of the vessel.
 - d. Condition of each tank.
 - e. Estimated items to be installed, removed, or relocated after the survey, including the weight and location of each item.
 - f. Schedule of events.
 - g. Person or persons responsible for conducting the survey.
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Specific Guidance for Inclining Experiments

- ❑ Ensure the requirements of [46 CFR 170.185\(g\)](#) are included in the submission:
 - a. Identification of the vessel to be tested.
 - b. Date and location of the test.
 - c. Inclining weight data.
 - d. Pendulum locations and lengths.
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- e. Approximate draft and trim of the vessel.
 - f. Condition of each tank.
 - g. Estimated items to be installed, removed, or relocated after the test, including the weight and location of each item.
 - h. Schedule of events.
 - i. Person or persons responsible for conducting the test.
- An initial survey of the vessel should be conducted one day prior to the inclining in the presence of the Coast Guard witness to ensure the vessel is at least 98% or more complete.
 - The list of weights to add/remove/relocate should be supplied to the Coast Guard witness prior to the survey.
 - The vessel should be moored such that it is capable of floating free during the course of the inclining, as detailed in reference (c).
 - Ensure that a minimum of eight weight movements are planned, with at least three points on each side of the zero point.
 - The inclining weights should be clearly described and either be weighed on a certified scale in the presence of the Coast Guard witness, or a valid weight certificate supplied to the witness before the test is conducted.
 - The weight movements should not heel the vessel more than 4 degrees to either side.
 - Three pendulums are required. In some cases, with prior approval from the MSC, electronic devices or U-tubes can be swapped for a pendulum, however, three measurement devices will still be required.
 - Ensure that the pendulums are long enough to achieve 6 inches deflection when the maximum heeling moment is applied. Typically, 10 feet is the minimum length of a pendulum to achieve the required deflection.

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- ❑ Ensure that the tankage specified in the procedure is acceptable per reference (c). The number of slack tanks must be kept to a minimum.
 - ❑ Ensure that pendulum locations are widely separated (preferably distributed transversely and longitudinally throughout the vessel) and varying in length (a minimum of at least 2 inch difference) to ensure independent readings, to guard against erroneous results, and to assess phenomena such as hull deflection (torsion).
 - ❑ Ensure on-board personnel are limited to individuals essential to conducting the stability test. Their combined weight must remain constant throughout the test.
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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 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 Marine Safety Center (MSC), the unit responsible for implementing this guidance.