

MSC Guidelines for Review of Crane Lifting Calculations

Procedure Number: T1-3

Revision Date: 01/19/00

References

- a. 46 CFR 173, Subpart B, Lifting
 - b. Marine Safety Manual, Volume IV, Chapter 6 (Counterweight)
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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 Transportation expressly disclaim liability resulting from the use of this document.

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: **T1-3**

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General Review Guidance

- 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?
 - These guidelines apply only to those vessels that (per 46 CFR 173.005):
 - Are equipped to lift cargo or other objects; **AND**
 - Have a maximum heeling moment due to a hook load greater than or equal to: $(0.67)(W)(GM)(F/B)$ (in foot-long tons)
 - Ensure the following drawings (items) are submitted (per 46 CFR 170.075):
 - General Arrangements including crane location
 - Lines, offsets, or computer disk with hull model
 - Tank Capacity tables
 - Free Surface data
 - Draft Mark locations
 - Crane data
 - Intact Stability Requirements (See included flowchart)
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- Counterballasted Vessels (46 CFR 173.020 and 46 CFR 173.025):
 - Ensure that the provided calculations demonstrate that the subject vessel can withstand the sudden loss of the hook load, in each condition of loading and operation and at each combination of hook load and crane radius. See 173.025(a) and 173.025(b).
- Non-counterballasted Vessels (46 CFR 173.020):
 - Ensure that the provided calculations demonstrate compliance with the intact stability requirements of 46 CFR 173.020(b).
 - If the subject vessel's hull proportions fall within all three limits specified by 46 CFR 173.020(c), the vessel owner may, in the presence of the OCMI, demonstrate compliance with 46 CFR 173.020(d) in lieu of 46 CFR 173.020(b).
- *Note: When reviewing the intact stability requirements for crane lifting, it is important to verify that the hook load is considered to be located at the head of the crane in accordance with 46 CFR 173.007.
- Ensure that the downflooding points (on both the crane and counterballasted side of the vessel) are correctly accounted for in the stability calculations.
- If the vessel has multiple cranes ensure that calculations have been performed independently and combined and that all operating restrictions are noted.
- For Counterballasted Vessels:
 - Ensure calculations are provided demonstrating compliance with the graph requirements of 46 CFR 173.025(b).
- The MSC may construct a computer model from the lines, offsets, or provided disk, and independently verify the intact stability of the vessel.

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.

Hook Load: The weight of the object lifted by the crane.

Attachment

Lifting criteria flow chart

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LIFTING

46 CFR 173.005

