

# Marine Safety Center Guidelines for Review of Liftboat Stability Calculations

Procedure Number T1-34

Revision Date: 07/01/03

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## References

- a. 46 CFR Subchapter L, Part 174 Subpart H
  - b. Navigation and Vessel Inspection Circular 8-91, "Initial and Subsequent Inspection of Existing, Uncertificated Offshore Supply Vessels, including Liftboats"
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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 Homeland Security expressly disclaim liability resulting from the use of this document.

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## 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: T1-34

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## General Review Guidance

If the vessel's stability is being reviewed under Navigation and Vessel Inspection Circular (NVIC) No. 3-97, "Stability Related Review Performed by the American Bureau of Shipping for U.S. Flag Vessels," then MSC review of stability items is not required.

Specify the applicability to Subchapter (I) or Subchapter (L)

- For Liftboats certificated under 46 CFR Subchapter I, only Intact Stability is required. To be certificated under Subchapter I, the liftboat must have been contracted for, or the keel must have been laid, before March 15, 1996. Also, construction must have been completed and a Certificate of Inspection must have been issued by March 16, 1998.
  - For Liftboats certificated under 46 CFR Subchapter L, Intact and Damage Stability are required.
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Check that the following items are included in the submittal package:

- ❑ General Arrangement and Profiles Drawings (with compartmentation)
  - ❑ Lines Plan or computer disk with hull model (GHS is preferred)
  - ❑ Hydrostatics or Curves of Form
  - ❑ Tank Capacity Tables
  - ❑ Maximum KG Curve or Table
  - ❑ Calculation of light ship values from stability test data
  - ❑ Sample Loading Conditions
  - ❑ Location of downflooding points
  - ❑ Damage Stability Calculations for Liftboats certificated under 46 CFR Subchapter L
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## Intact Stability

Ensure submitted stability calculations are consistent with the requested route (restricted or unrestricted).

- ❑ Unrestricted Service: Calculations must demonstrate compliance with MODU stability requirements (see MSC Procedure H1-02, 46 CFR 174.250 or Enclosure (3) to reference (b))
- ❑ Restricted Service:
  - ❑ Liftboats certificated under 46 CFR Subchapter I: indicate if restricted route is inside the boundary line or outside the boundary line (Enclosure (3) to reference (b)):
    - ❑ For Subchapter I Liftboats with a route restriction of inside the boundary line, calculations must use 50 knot winds (with the legs fully raised) ;
    - ❑ For Subchapter I Liftboats with a route restriction of outside the boundary line, calculations must use 50 knot winds (with the legs fully raised), 60 knot winds (with the legs fully raised), and 70 knot winds (legs may be lowered);
      - ❑ 60 knot wind calculations may be eliminated if 70 knot wind calculations are done with the legs fully raised.
  - ❑ For Liftboats certificated under 46 CFR, Subchapter L: calculations must use 60 knot winds (with the legs fully raised) and 70 knot winds (legs may be lowered) (see 46 CFR 174.255(a)(2)).
    - ❑ 60 knot wind calculations may be eliminated if 70 knot wind calculations are done with the legs fully raised

If 70 knot wind calculations are submitted with the legs lowered, ensure the amount legs are lowered is compatible with the water depth of the vessel's area of operation. (Example: Vessel has 90' legs. 70 knot wind intact stability calculations

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specify lowering the legs 50'. This may not be possible since the vessel, more than likely, won't be able to enter a harbor of safe refuge with the legs lowered 50'.)

Ensure submitted maximum KG curve or table accounts for worst case or specific load case trim.

Ensure maximum deck load from sample loading conditions is equal to the maximum deck load specified in the vessel's leg strength calculations.

Ensure sample load case VCG's fall below maximum KG curve.

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## Damage Stability

Damage stability applies only to those liftboats certificated under 46 CFR Subchapter L.

- ❑ Ensure damage stability calculations required by 46 CFR 174.255(b) use 50 knot winds.
- ❑ Ensure damage stability calculations are submitted for each compartment within 30" of the hull, between two adjacent watertight bulkheads and the uppermost continuous deck (46 CFR 174.255(b)(4)).
- ❑ Ensure submitted maximum KG curve or table is a composite of the maximum KG curve determined from intact stability plus the maximum KG curve determined from damage stability.

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## Freeboard

Freeboard requirements must be met with maximum load.

- ❑ For liftboats greater than 79 feet in length, the load line requirements of 46 CFR Subchapter E apply.
  - ❑ Ensure the lesser of stability drafts or Geometry Load Line drafts govern.
- ❑ For Liftboats certificated under 46 CFR Subchapter I, with a restricted route of inside the boundary line, a minimum freeboard amidships equivalent to the vessel's depth divided by 4 ( $D/4$ ) is required (Enclosure (3) to reference (b)).
- ❑ For Liftboats certificated under 46 CFR Subchapter I, with a restricted route of outside the boundary line, a minimum freeboard amidships equivalent to 2 feet is required (Enclosure (3) to reference (b))

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## Hull Model

The MSC will generate a hull model from the lines, offsets or provided computer disk using GHS to verify the stability of the vessel.

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## Definitions

- Downflooding Point: The lower edge of an opening through which progressive flooding may take place.
- Restricted Service:
  - For Liftboats certificated under 46 CFR Subchapter I:
    - If operated inside the boundary line, Restricted Service is service in areas within 8 hours of a harbor of safe refuge or in areas where the vessel may elevate to survive 100 knots of wind.
    - If operated outside the boundary line, Restricted Service is service in areas within 12 hours of a harbor of safe refuge or in areas where the vessel may elevate to survive 100 knots of wind.
  - For Liftboats certificated under 46 CFR, Subchapter L, Restricted Service is service in areas within 12 hours of a harbor of safe refuge or in areas where a liftboat may be jacked up to meet the 100 knot wind severe-storm criteria of 174.255(c).