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LIFT BOATS

16711
D8 (m) Policy
March XX, 2005

MEMORANDUM

From: R. W. BRANCH
Captain

Reply to
Attn of:

To: Distribution

Subj: LIFTBOAT INSPECTION POLICY

- Ref:
1. 46 Code of Federal Regulations, Subchapter I – Cargo/Misc. Vessels, Certificated or prior to March 16, 1998 (for grandfathered vessels)
 2. 46 Code of Federal Regulations, Subchapter L – Offshore Supply Vessels
 3. 46 Code of Federal Regulations, Subchapter T – Small Passenger Vessels
 4. Navigation & Vessel Inspection Circular 8-91 – Initial and Subsequent Inspection of Existing, Uncertificated Offshore Supply Vessels, Including Lifeboats
 5. Navigation & Vessel Inspection Circular 7-68 – Notes on Inspection and Repair of Steel Hulls
 6. D8 Policy letter Dated 09OCT98 – PERSONS ALLOWED ON LIFTBOATS
 7. D8 Policy letter Dated 12NOV98 – RESCUE BOAT REQUIREMENTS ON OSVS
 8. American Bureau of Shipping's 1973 & 1988 MODU Rules
 9. American Bureau of Shipping's 1973 Steel Barge for Offshore Service Rules
 10. American Petroleum Institute (API), Recommended Practice for Offshore Cranes

1. PURPOSE

This policy letter provides Marine Inspectors in the Eighth Coast Guard District information regarding the certification and inspection of liftboats that are inspected under Navigation and Inspection Circular 8-91, 46 Code of Federal Regulations (CFR), Subchapter T – Small Passenger Vessels, 46 CFR, Subchapter I – Cargo and Miscellaneous vessels and 46 CFR, Subchapter L – Offshore Supply Vessels. Due to the nature of these vessels, only parts of 46 CFR Subchapter L are applicable on the pre-March 15, 1996 keel-laid or contracted vessels or the pre-March 16, 1998 grandfathered vessels. Issues covered in this policy letter include: engineering related systems, steel wastage, tailshaft inspection intervals, drydock issues, lifesaving systems, fire fighting equipment; systems/equipment for general operation, crane inspection and manning.

2. DIRECTIVES AFFECTED

None.

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3. BACKGROUND

Since the publication of Subchapter L, there have been numerous regulatory changes affecting the inspection of liftboats in varying degrees. Liftboats fall under the same regulatory standards as conventional OSVs; however, there are several areas of inspection that are unique to this type of vessel. This guidance is designed to help address these liftboat-specific differences and aid the OCMI and field inspector in the interpretation and application of the applicable regulations, policies and standards.

4. DISCUSSION

A. Engineering Related Systems: Whether new or existing vessels, each vessel will have varying degrees of automation based on the requirements at time of vessel certification. NVIC 1-78 governs automation on those vessels over 100gt certificated before March of 1996. Title 46 CFR 130.400 subpart D addresses requirements for those vessels over 100 GT inspected under 46 CFR Subchapter L. The following items listed below shall be supplied and checked for proper operation and maintenance on all liftboats regardless of tonnage or inspection subchapter.

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- (1) Bilge alarms - Required in all engineering and machinery spaces. An audible and visual alarm for each space shall be provided at the pilothouse and shall be properly marked. No devices may be installed to disable these alarms.
 - (2) Engine Overspeeds - Engine overspeed devices on all prime movers are grandfathered. If installed, they must operate properly and be tested.
 - (3) Ventilation shutdown - Required on all power ventilated equipment including heat pumps and other such devices used in hotel services. Natural vents connected to the engine room and deckhouse are required to have weathertight enclosures and shall be appropriately marked, "Close in Case of Fire."
 - (4) Level Alarm - All liftboats should be fitted with a level indicator to indicate change in vessel level height; a distinct alarm that sounds at the main operating station should be in place to warn of uneven legs due to sinking into the sea bottom when elevated.
 - (5) Low Hydraulic Oil Level Alarm - All liftboats should be fitted with an audible and visual alarm at the main operating station that indicates a loss in hydraulic oil level in the main jacking system.
 - (6) Shaft Speed - Shaft speed must be available to the operator on the bridge. Engine speed may be obtained via (1) an engine tachometer with corresponding "shaft sheets" that convert engine RPM to shaft RPM or (2) a separate shaft tachometer.

B. Steel Wastage Allowance: Liftboats are weight-specific vessels; historically they have been built with overall weight kept to a minimum. This reduction in weight in the past led to many older liftboats being built with reduced scantlings compared to conventional hulls of the time. For newer liftboats built in accordance with 46 CFR Subchapter L, wastage allowed is in keeping with NVIC 7-68 of 25%, however, for older liftboats, standards of the time will be used to determine appropriate wastage standards. Although most of these older vessels were built with the standards of ABS's 1973 MODU Rules and referenced ABS Steel Barge rules, some were not. In the latter cases, it was trial and error until the vessel was found to be

USUALLY
1.5' - 2.5'

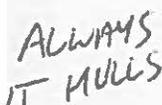
sturdy enough to satisfactorily meet service demands. These older liftboats were in service for many years prior to their requirement to be inspected, consequently these vessels were built without Coast Guard oversight or approved plans and no section modulus or leg strength calculations provided. Fortunately, most vessels still in service were built with the aforementioned ABS rules and appropriate wastage allowances may be applied. The thickness utilized for evaluation shall be the actual thickness on board the vessel and compared to the approved thickness. In many cases, thicker plate was used during construction, compared to the thickness required by ABS' Rules or otherwise approved. Because of this, more wastage may be seen on a particular vessel, but still be within tolerance of the approved plans. Since there are many possibilities found on vessels currently operating, there are three unique categories of liftboats when considering wastage allowances.

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- (1) Vessels built to 46 CFR Subchapter L & I standards with approved plans: allow 25% wastage in accordance with NVIC 7-68.
 - (2) Vessels built without approved plans: Allow 20% wastage for 1/4" or thicker steel hull or deck plating in accordance with ABS 1973 MODU and Steel Barge rules. Allow 10% wastage for 3/16" or thinner steel hull or deck plating in accordance with ABS 1973 MODU and Steel Barge rules.
 - (3) Vessels built without approved plans but having a Professional Engineer-provided section modulus and strength calculations: Allow maximum wastage as per calculations, but in no case allow more than 25% in accordance with NVIC 7-68.

C. Tailshaft intervals - All liftboats less than 100 gross are not required to pull tailshafts for examination. All other liftboats of greater than 100 GT will be required to undergo tailshaft examinations as per the appropriate regulations. Proper tailshaft/propeller fit-up is necessary to eliminate or minimize damage due to excess vibration or possible cavitation. An owner/operator may prove proper fit-up by many methods, including bluing, micrometer readings and others. The owner is responsible to ensure proper fit-up of the vessel's tailshaft.

D. Drydocking - Unique criteria to be checked for liftboats subject to all subchapters -

There are many acceptable methods for drydocking a liftboat. The following methods will be considered depending on the vessel's size, provided the alternatives maintain a due standard of care and that a similar level of safety is considered.

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- (1) Conventional Drydocking - lifting the vessel and its appendages out of the water to perform a comprehensive evaluation of the vessel's underwater body, inspecting the hull, submerged portions of legs and towers and the pads.
 - (2) Drydock Alternatives - The Eighth Coast Guard District published D8 Policy 99-08 on April 15, 1999 that discusses the Coast Guard's openness to various alternatives that provide a similar level of safety as a standard vessel drydocking. These alternatives include provisions found in 46 CFR Subchapter L, specifically 46 CFR 170; and alternatives found in 46 CFR Subchapter I-A, specifically 46 CFR 107.267 for self-elevating units. At no time shall the alternative method place the crew, shipyard workers, 3rd party surveyors, contractors, or Coast Guard inspectors in danger.
 - (3) Lastly, an underwater inspection in lieu of drydocking (UWILD) may be utilized, provided all aspects of the Navigation and Vessels Inspection Circular (NVIC) 1-89 - Underwater Survey Guidance is followed. The Federal Register dated August 5, 2004

Volume 69, Number 150, Page 47378-47384 announces the final rule that NVIC 1-89 be available to offshore supply vessels.

Liftboats spend the majority of their service life jacked up out of the water; as such, special attention must be paid to these particular items:

OFTEN SHOULD BLAST PADS TO REVEAL CRACKS

- (1) **Pads** - These connections at the bottom of the legs are the main load-bearing area of the vessel; the entire pad, (top, bottom and all sides) needs to be visually inspected for damage/ insets, by "dry docking" or some other "alternative" methods acceptable to the OCMI. The leg-to-can connection welds and the can-to-pad connection welds must be non-destructively tested (NDT) at every drydock or anytime the vessel has had an incident involving undue stress in these areas.
- (2) **Leg Tower sponsons** - The area above the leg pad on the hull must be checked for insets and fractures; often debris will be on the pad when the leg is retracted and will cause hull damage in these areas. This area is critical to the support of the leg and tower; if insets are deep or numerous, the area must be cropped and renewed and access must be provided in the leg sponson to ensure the internal framing is not tripped or fractured.
- (3) **Legs and Leg Rack** - The leg rack is another critical area of the vessel. This is where the hydraulic motor drive gear meets the mechanical leg rack. Great amounts of torque are applied to this area on a regular basis. The racks must be inspected for chipped, missing teeth, and excessive rack-to-gear wear. The legs should be inspected for significant creases, dents and deflections. These can increase the rack to gear clearance and allow the gear to free wheel, causing the vessel to descend uncontrollably.
- (4) **Leg Removal & Inspection Intervals: To be Developed** NO REGULATORY INTERVALS YET
- (5) **Leg-tower Clearance** - Each designer and builder calls out a particular leg-to-tower clearance range for proper operation of the vessels leg and jacking system; too tight the system may bind, too loose, the system may wobble and/or cause improper rack-pinion operation. Although this clearance may deviate from one vessel to another, it is imperative that the clearance be noted and compared to the designer's recommended range. When the clearance falls out of the recommended range, the owner/operator must present a proposal to bring this clearance back to the proper specifications.

E. Lifesaving Policy:

- (1) **Rescue Boats** - Required on all liftboats regardless of length and tonnage on all coastwise and oceans routes. If no launching device is provided, the rescue boat must be able to be launched with either crane. One winch on any crane that is used to launch a rescue boat must be certified for personnel use. All pre-Subchapter L rescue boats must be equipped with minimal safety equipment. A prudent minimum level of equipment is: (2) paddles, (2) heaving lines, (2) sponges, (1) boat hook, and (1) bailer. All Subchapter L rescue boats must be outfitted with full SOLAS equipment, which is reflected in 46 CFR 133.175.

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- (2) **Rescue Platforms** - While liftboats were allowed to use the installed cranes for the launch of rescue boats in lieu of an installed davit, stability concerns and the vessel's operations manual prohibit the use of the cranes while the vessel is underway. The vessel must be equipped with a means to recover a helpless person while underway. This can be accomplished in several ways, depending on the vessel's hull design. Older vessels have

leg pads that retract up to the hull and are exposed when underway. These can be used as a rescue platform provided a suitable means is installed to access the pad and a means is provided to remove the helpless person to the main deck. On many newer vessels, the pad is submerged while underway, and a rescue platform must be provided. These platforms will vary from hull to hull design, and it will be the OCMI's discretion to deem the platform fit for service. A rescue harness must also be provided regardless of platform type.

(3) Lifesaving Systems - Equipment, systems and arrangements shall comply with 46 CFR 133.10 - Lifesaving Systems, Applicability.

(4) Embarkation Devices - Embarkation ladders (Jacob's Ladders) are not required on liftboats. It has been a long-standing industry practice that these vessels install knotted manropes for emergency embarkation. These knotted manropes are allowed and encouraged and produce the best alternative to having mariners jump in the water to disembark the vessel to a safety.

MUST BE ABLE

a.) Industry's position is that the Jacob's ladder is a redundant lifesaving device. Egress from a liftboat in an emergency will be to a nearby platform or rig or by crane and Billy Pugh to the water and a waiting vessel. The rope ladder is designed for the crane operator and/or the last person off to have a means of escape to safety.

b.) If a knotted rope is installed, it shall be long enough to reach the water at the liftboat's highest elevated position, and be annually examined by the vessel's crew. Soiled, worn or frayed ropes and worn, cracked or dully corroded attachments shall be replaced immediately.

F. Fire Fighting and Alarm Equipment:

(1) Fire Pumps - All liftboats must have an installed fire pump, its output is regulated under the appropriate subchapter. These fire pumps shall be of the submersible type, mounted on the main deck, and connected to the fire main system through a flexible hose. The condition and serviceability of these flex hoses must be inspected. The launch appliance for lowering the pump into the water must also be inspected for proper operation and condition.

VESSEL MUST BE JACKED UP AS HIGH AS THEY WOULD BE FOR FIRE PUMP TEST

(2) Smoke Alarms - Required in each separate living space and galley. Smoke alarms ay be battery powered, independent type units; and all must have a test switch.

G. General Operations:

(1) Operations Manual - All liftboats must have an approved Operations Manual onboard approved by the local OCMI. This manual should include vessel particulars and safety information, including, but not limited to those found in 46 CFR 134.170.

WE MUST REVIEW OPS MANUAL - EVEN IF BS ALREADY REVIEWED

(2) Dead Man Feature - The liftboat jacking system must incorporate a dead man feature at the system controls, which requires a physical force from the operator (through hand and or foot pedal) that must be applied to the controls in order for the system to function. Once the applied force is removed, the dead man system stops the vessel from jacking. Often, this is done through use of a foot pedal or spring-loaded hand toggles.

(3) Anemometer - If the liftboat's approved Operations Manual requires actions based on wind speed, the vessel must have a properly operating anemometer (portable or fixed) on board.

* ADEQUATE PRELOAD TIME MUST BE PROVIDED TO OBSERVE CONDITIONS PRIOR TO JACKING UP

ENSURE
THAT ANCHORS
ARE INSTALLED
SO IT WILL
NOT FALL
IN PAD

- (4) **Anchors** - Anchors are required on all liftboats. Current liftboats may use anchors as they are currently installed on the vessels. Standards set forth in ABS rules, utilizing first principal calculations, may be used to determine the appropriate anchor size. In addition, a general rule of thumb commonly used in the past was:
Anchor Weight = 0.5 x Engine Horsepower of one shaft

Liftboats are restricted in their routes through their approved Operations Manual to water depths that do not exceed the vessel's ability to jack up. However, if a liftboat loses steering or propulsion in a river current the liftboat may travel a significant distance before the legs can be jacked down to stop the vessel, which may cause serious damage to nearby vessels; or the vessel may incur damage to the legs by suddenly stopping the vessels utilizing legs as emergency anchors. The required anchors are considered emergency anchoring systems, whereby a windlass system is not required to pick up anchor after it is deployed.

H. **Cranes:**

- (1) Cranes, whether inservice or new, must meet the requirements of American Petroleum Institute's standard,
- (2) **Cranes** - All liftboat cranes must have the following basic features:
 - a) Load charts for the specific crane installed showing both dynamic and static load.
 - b) Hand signal safety charts.
 - c) All controls properly labeled.
 - d) Boom angle indicator provided.
- (3) **Load Tests** - In accordance with 46 CFR 107.259, American Petroleum Institute (API) requires all cranes be load tested, liftboats are no different, and intervals will be based on the subchapter that applies. All cranes must be load tested after any major repairs. Most liftboat operators now currently load-test annually for insurance reasons, and many of the major companies that contract them require it.

I. **Manning:**

- (1) Manning for vessels over 100 GT is straight forward, as Marine Safety Manual, Volume III, Chapter 21, provides ample guidance.
- (2) However, manning continues to be a contentious issue for those vessels less than 100 GT throughout the Gulf of Mexico, across various OCMI zones. There are numerous vessels that have requested route changes over the years from partially protected and exposed water routes to protected routes and back again based on contracts that the vessel had at the time. The vessel's COI endorsements for minimum manning were not updated to reflect these changes. Because of this, various interpretations and local policies have conflicted, creating an uneven level of safety and may impose an economical disadvantage from one operator to another. After careful examination of liftboats less than 100 GT across various OCMI zones, the following has been determined as adequate minimum safe manning, which is based on the vessel's route, associated required equipment on board, machinery automation and applicable laws, regulations and national policies.
 - a) Voyage >12 hours of operation in a 24 hour period

- i. Oceans, Coastwise or Lakes, Bays & Sounds:
 1. 1 Master, 1 Mate, 2 Deckhands

- b) Voyages <12 hours of operation in a 24 hour period:
 - i. Oceans & Coastwise Route – Rescue Boat Required
 1. 1 Master, 2 Deckhands
 - ii. Lakes, Bays & Sounds Route, Vsl >65' in Length – Rescue Boat Required
 1. 1 Master, 2 Deckhands
 - iii. Lakes, Bays & Sounds Route, Vsl <65' in Length – No Rescue Boat Required*
 1. 1 Master*, 1 Deckhand*

* On vessels less than 65' in length operating on protected routes, 46 CFR 180.210(d) provides "a required rescue boat must be acceptable to the cognizant OCMI." There is an implied regulatory "cutoff" for Lifesaving equipment on vessels less than 65' in length and operating on protected warm water routes, as noted below.

- a) Vessels on L,B,S's, warm water, are not required to carry survival craft 180.207(c)
- b) Vessels operating on L,B,S's are not required to carry EPIRB's 180.64
- c) Vessels operating on L,B,S's have reduced distress signal requirements, 180.68(b)
- d) Vessels less than 65' in length require only one ring buoy, 180.70(a)(2)

5. ACTION

Eighth District OCMI's shall use the criteria in the above "Discussion" section to inspect liftboats when laws, regulations and policies do not provide adequate guidance to determine reasonable standards of care. OCMI's shall evaluate current vessels in their fleet of responsibility and make appropriate changes to vessels' Certificates of Inspection (Routes and Conditions, Manning, etc) to gain uniformity throughout the inspection zones of the Eighth Coast Guard District. OCMI's shall amend vessels' COI's during the vessels' next required annual inspection or sooner if a situation presents itself that may cause loss of life, loss of property or damage to the environment. My primary POC for this matter is LT Phillip Ison at (504) 589-3049.

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Enclosures: (1) Standard Liftboat COI Endorsements

Copy: (1) Commandant (G-MOC), Office of Compliance

Liftboat Operating Manual checklist

TITLE 46--SHIPPING

CHAPTER I--COAST GUARD, DEPARTMENT OF HOMELAND SECURITY

PART 134--ADDED PROVISIONS FOR LIFTBOATS--Table of Contents

Sec. 134.170 Operating manual.

- ___ (a) Each liftboat must have aboard an operating manual approved by the Coast Guard as complying with this section.
- ___ (b) The operating manual must be available to, and written so as to be easily understood by, the crew members of the liftboat and must include the following:
- ___ (1) A table of contents and general index.
- ___ (2) A general description of the vessel, including--
- ___ (i) Major dimensions; (length, width, depth, height of legs)
- ___ (ii) Tonnages; and
- ___ (iii) Load capacities for--
- ___ (A) Various cargoes; (liquid and deck cargoes)
- ___ (B) Crane hook; and
- ___ (C) Helicopter-landing deck.
- ___ (3) Designed limits for each mode of operation, including--
- ___ (i) Draft;
- ___ (ii) Air gap; Note: Check if air gap is greater than wave height, if not make comment to provide sufficient clearance between hull and wave height
- ___ (iii) Wave height;
- ___ (iv) Wave period;
- ___ (v) Wind;
- ___ (vi) Current;
- ___ (vii) Temperatures; and
- ___ (viii) Other environmental factors.
- ___ (4) The heaviest loads allowable on deck.
- ___ (5) Information on the use of any special cross-flooding fittings and on the location of valves that may require closure to prevent progressive flooding.
- ___ (6) Guidance on preparing the vessel for heavy weather and on what to do when heavy weather is forecast, including when critical decisions or acts--such as leaving the area and heading for a harbor of safe refuge, or evacuating the vessel--should be accomplished.
- ___ **Optional:**
- ___ a. Monitoring of weather forecasts to proceed to successively higher levels of preparation.
- ___ b. Instructions for all personnel to wear life preservers.
- ___ c. Evacuate personnel from machinery spaces below deck.
- ___ d. Fasten all loose items on deck.

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- ___ e. Close all WT vent covers and other openings.
- ___ f. Place generators on line or in standby mode.
- ___ (7) Guidance on operating the vessel while changing mode and while preparing the vessel to make a move, and information on how to avoid structural damage from shifting loads during heavy weather.
- ___ (8) Information on inherent operational limitations for each mode and on changing modes, including preloading instructions. Note: preloading is generally done by sequentially filling tanks and allowing the vessel to settle before jacking to operating level.
- ___ **Optional:**
- ___ a. Instructions not to rock or twist vessel if pads are stuck in mud.
- ___ b. Instructions not to shift deck loads while afloat.
- ___ c. Instructions to close all WT doors, hatches, and unused vent covers before jacking down.
- ___ d. Instructions on raising and lowering legs simultaneously.
- ___ e. Instructions to level vessel when jacking up.
- ___ f. Instructions to not submerge deck to break legs free from mud.
- ___ g. Instructions for all personnel to wear life preservers whenever jacking operations occur.
- ___ (9) Guidance on the proper procedures for discovering the flooding of a normally buoyant leg or leg pad, precautionary information concerning the effects on stability of flooded legs, and what to do upon discovering the flooding of a normally buoyant leg or leg pad.
- ___ (10) A description, a diagram, operating guidance for the bilge system, and an alternative method of dewatering. (including a description of their limitations, and spaces not connected to the bilge system)
- ___ (11) A general arrangement diagram showing the locations of--
 - ___ (i) Watertight and weathertight compartments;
 - ___ (ii) Openings in the hull and structure;
 - ___ (iii) Vents and closures;
 - ___ (iv) Shutdowns for mechanical and electrical emergencies, and for emergencies affecting ventilation;
 - ___ (v) Alarms for flooding and for too-high and too-low levels;
 - ___ (vi) Fire and gas detectors; and
 - ___ (vii) Access to different compartments and decks.
- ___ (12) A list of shutdown locations for emergencies and guidance on restarting mechanical and electrical equipment and equipment for ventilation after shutdowns.
- ___ (13) A diagram of the hazardous locations (if applicable).
- ___ (14) A diagram of the emergency-power system.
- ___ (15) Stability information setting forth the maximum allowable height of the center of gravity in relation to draft data, displacement, and other applicable parameters unique to the design of the unit to determine compliance with the intact and damage stability criteria, under Sec. Sec. 174.250 and 174.255 of this chapter.
- ___ (16) Curves of form as required under Sec. 170.075(a)(3) of this chapter.

INSPECTION OF LIFTBOATS

- REF:
- A) NVIC 8-91
 - B) CID MEMO 17, Inspection policy for OSV less than 100GT, sub "I" or "T"
 - C) 46 CFR 90-105, sub "I", vessels Certificated prior to 18MAR1998
 - D) 46 CFR 125-134, sub "L"
 - E) D8 Policy letter Dated 09OCT98 "PERSONS ALLOWED ON LIFTBOATS"
 - F) D8 Policy letter Dated 12NOV98 "RESCUE BOAT REQUIREMENTS ON OSVS"
 - G) CID MEMO 19, INSTRUCTIONS FOR REVIEWING LIFTBOAT OPS MANUALS
 - H) NVIC 7-68

Cancellations: NONE

1. With the publication of Subchapter "L" there have been numerous regulatory changes affecting the inspection of liftboats. Liftboats fall under the same regulatory standards as conventional OSV's; however, there are several areas of inspection that are unique to this type of vessel. This guidance is designed to help address these liftboat specific differences and aid the inspector in the interpretation and application of these regulations.

2. Specific Policy Decisions

a. Engineering Related Policy:

(1) Bilge alarms- Required in all engineering and machinery spaces. An audible and visual alarm for each space shall be provided at the pilothouse and shall be properly marked. No devices may be installed to disable these alarms.

(2) Engine Overspeeds- Engine overspeed devices on all prime movers are grandfathered. If installed, they must operate properly and be tested.

(3) Ventilation shutdown- Required on all power ventilated equipment including heat pumps and other such devices used in hotel services. Natural vents connected to the engine room and deckhouse are required to have weathertight enclosures and shall be appropriately marked, "Close in Case of Fire."

3. Deck/Hull , Drydocking Policy:

(1) Percentage of Wastage Allowed- Liftboats are weight specific vessels, they were and are built with over all weight to be kept to a minimum. This reduction in weight in the past led to many older liftboats being built to reduced scantlings as compared to conventional hulled vessels of the time. For newer liftboats (none public law), formal wastage allowed as per NVIC 7-68 is 25%, however, for older liftboats, built to lighter scantlings, will require a subsequent reduction in percent of wastage allowed. These older liftboats were in service for several years prior to their requirement to be inspected, consequently these vessels were built without approved plans and no section modulus calculations provided. As a result, there are three unique categories of liftboats when considering wastage allowances.

- a) Vessels built to sub "L" & "I" standards with approved plans, allowed 25% wastage per NVIC 7-68.
- b) Vessels built without approved plans, to minimum 1/4" maindeck and hull bottom plate and 3/16" side shell plate, allowed 20% wastage; all vessels greater than 20 years in service, gauging required every other drydock (once every five years).
- c) Vessels built without approved plans, 3/16" or less on main deck and hull bottom plate, less than 3/16" on side shell plate, allowed 10% wastage, all vessels greater than 20 years in service (the majority of these vessels will fall into this group), gauging required every drydock.

(2) Tailshaft intervals- All liftboats using a water cutlass bearing are not required to pull shafts since bearing wear can be determined visually. All other types will be inspected as per existing policy and regulations.

(3) Unique criteria to be checked at drydock- Liftboats spend the majority of their service life jacked up out of the water; as such, special attention must be paid to these items:

a) Pads- These connections at the bottom of the legs are the main load bearing area of the vessel; they must have a visual inspection and air test at each drydock to check for fractures and insets. The leg-to-pad connection (welds) and the can-to-pad connection (welds) must be NDT tested at every drydock or anytime the vessel has had an incident involving stress in these areas.

b) Leg Tower sponsons- The area above the leg pad on the hull must be checked for insets and fractures; often debris will be on the pad when the leg is retracted and will cause hull damage in these areas. This area is critical to the support of the leg and tower; if insets are deep or numerous, the area must be cropped and renewed and access must be provided in the leg sponson to ensure the internal framing is not tripped or fractured.

c) Legs and Leg Rack- The leg rack is another critical area of the vessel. This is where the hydraulic motor drive gear meets the mechanical leg rack. Great amounts of torque are applied to this area on a regular basis. The racks must be inspected for chipped, missing teeth, and excessive rack-to-gear wear. The legs should be inspected for significant creases, dents and deflections. These can increase the rack to gear clearance and allow the gear to free wheel, causing the vessel to descend uncontrollably.

C. Lifesaving Policy:

(1) Rescue Boats- Required on all liftboats regardless of length and tonnage on all coastwise and oceans routes. All rescue boats installed on pre sub "L" vessels must be equipped per MSO Morgan City policy letter Serial# M-00010 dated 11JAN00 with (2) paddles, (2) heaving lines, (2) sponges, (1) boat hook, (1) bailer. All rescue boats installed on sub "L" vessels must have full SOLAS outfitting as designated in 46 CFR 133.175.

(2) Rescue Platforms- While liftboats were allowed to use the installed cranes for the launch of rescue boats in lieu of an installed davit, stability concerns and the vessel's operations manual prohibit the use of the cranes while the vessel is underway. The vessel must be equipped with a means to recover a helpless person while underway. This can be accomplished in several ways depending on the vessel's hull design. Older vessels have leg pads that retract up to the hull and are exposed when underway. These can be used as a rescue platform provided a suitable means is installed to access the pad and a means is provided to remove the helpless person to the main deck. On many newer vessels, the pad is submerged while underway, and a rescue platform must be provided. These platforms will vary from hull to hull design, and it will be up to the inspector's discretion to deem the platform fit for service. A rescue harness must also be provided regardless of platform type.

(3) Smoke Alarms- Required in each separate living space and galley. May be battery powered independent type units. Must have a test switch.

(4) Embarkation Devices- Embarkation ladders (Jacob's Ladders) are not required on liftboats. It has been a long standing industry practice that these vessels installed knotted man ropes for emergency embarkation. These knotted man ropes are allowed and encouraged though not required. This issue was one that was hotly debated from 2001 to 2003 between the CG and the liftboat community. MSO Morgan City highly desired to have Jacobs ladders installed and felt that knotted ropes were not a sufficient lifesaving device. However, after much consultations with District Eight, various Coast Guard HQ senior level decision makers and with the Chief of the CGHQ Lifesaving and Fire Safety, COMDT(G-MSE-4), a final decision was made on 17 January, 2003 (via email) that knotted ropes or no ropes will suffice as adequate embarkation aids.

a.) The industry position is the Jacob's ladder is a redundant lifesaving device. Egress from a liftboat in an emergency will be to a nearby platform or rig, or by crane and Billy Pugh to the water and a waiting

vessel. The rope ladder is designed for the crane operator, the last person off, to have a means for his or her escape.

b.) If a knotted rope is to be installed, it shall be long enough to reach the water at the liftboat's highest elevated position, and be examined by the vessel's crew at least annually. Soiled, worn or frayed ropes and worn, cracked or dully corroded attachments shall be replaced immediately.

D. Fire Fighting Equipment Policy:

(1) Fire Pumps- All liftboats must have an installed fire pump, and its output is regulated under the appropriate sub chapter. These fire pumps are of the submersible type, are mounted on the main deck, and connected to the fire main system through a flexible hose. The condition and serviceability of these flex hoses must be inspected. The launch appliance for lowering the pump into the water must also be inspected for proper operation and condition.

E. General Operations:

(1) Level Alarm- All liftboats should be fitted with a level indicator to indicate change in vessel level height; a distinct alarm that sounds at the main operating station should be in place to warn of uneven leg sinkage when elevated.

(2) Low Hydraulic Oil Level Alarm- All liftboats should be fitted with an audible and visual alarm at the main operating station that indicates a loss in hydraulic oil level in the main jacking system.

(3) Operations Manual- All liftboats must have an approved Operations Manual onboard; see CID Memo 19.

(4) Dead Man Feature- The liftboat jacking system must incorporate a dead man feature at the system controls. What this means is that physical force from the operator (through hand and or foot pedal) must be applied to the controls in order for the system to function. When this force is removed, the system stops jacking. Often this is done through use of a foot pedal or spring-loaded hand toggles.

(5) Anemometer- If the liftboat's manual requires actions based on wind speed the vessel must have an anemometer (portable or fixed) on board.

(6) Anchors- Liftboats are restricted in their routes through their Operations Manual to water depths that do not exceed the vessel's ability to jack up. The application of ABS anchor rules for conventional OSVs is not practical. These anchors have been referred to as emergency anchoring systems. MOC policy letter dated 24MAY89 states that a liftboat anchor weight be calculated as $W(\text{weight of anchor}) = 0.5 \times \text{maximum horse power on one shaft}$ or $W = [\text{length} * (\text{Beam} + \text{depth})] / 12$, whichever is less.

F. Cranes:

(1) All liftboat cranes must have the following basic features:

- a) Load charts for the specific crane installed showing both dynamic and static loads.
- b) Safety hand signal charts.
- c) All controls properly labeled.
- d) Provide a boom angle indicator.

(2) All liftboat cranes must be load tested; intervals are based on the subchapter that applies. All cranes must be load tested after any major repairs. Most liftboat operators now currently load test annually for insurance reasons, and many of the major companies that they work for require it.

G. J. TOLBERT

Subj: INSTRUCTIONS FOR REVIEWING LIFTBOAT OPERATING MANUALS

References: NVIC 8-91

Cancellations: None

1. NVIC 8-91 requires each liftboat to have an Operating Manual which is reviewed and approved by the cognizant OCMI. The Marine Safety Center reviews each liftboat's stability and leg strength calculations prior to drafting the vessel's Stability Letter.
2. You will need the following:
 - a. All of the latest copies of the liftboat's operating manuals,
 - b. A copy of the "Checklist For Review of Liftboat Operating Manuals",
 - c. The letter from MSC to MSO Morgan City stating that MSC has reviewed their portion of the operating manual and found it acceptable,
 - d. The undated stability letter from MSC.
3. Use the attached "Checklist For Review of Liftboat Operating Manuals" as the guide for doing the review. The checklist is for your use so make notes on it as necessary.
4. Decide based on your review whether the manual (as is) should be approved, returned for revision, or approved pending incorporation of certain comments. The latter category is for a manual that is basically satisfactory but needs some minor additions/corrections/clarifications. Keep in mind that items on the checklist that are "RECOMMENDED" should not enter into your decision to approve or return the manual. "RECOMMENDED" items technically are nice-to-haves only.
5. If you feel it should be returned for revision, prepare a letter to the company stating that the operating manual is being returned for revision and why. The letter should reference NVIC 8-91. A sample letter that can be copied and used can be found in [CID]<m>m-20128. Note that the coordinator of the Operating Manual reviews can sign this letter "By Direction". All copies of the operating manuals should be stamped "RETURNED FOR REVISION" in red and sent back to the company. Keep one copy of the signed letter and put it in the vessel's operating manual file (located in the new construction office).
6. If you feel the operating manual should be approved or approved pending incorporation of comments, prepare a letter to the company stating such and listing any comments including required changes and recommended changes. The letter should reference NVIC 8-91. A sample letter can be found in [CID]<M>m-20093 and may be copied and used to assist in this. Then:
 - a. Review the letter from MSC to us to see if MSC wants a paragraph added to your approval letter stating that ABS can assign the vessel a loadline and where that loadline should be. If so, add the necessary words to your letter and list ABS to get a copy of the letter.

b. Using a date stamp, put the date (black ink) on the undated Stability Letter that MSC sent. The Stability Letter will be an enclosure to the approval letter.

c. Using the stamps and red ink, stamp the inside cover of each operating manual with the following: "APPROVED", the date, and "Chief, Inspection Division by direction of the OCMI". Leave space below the "APPROVED" stamp and above the "Chief, Inspection Division by direction of the OCMI" stamp for the CID's signature. These stamped manuals will be enclosures to your letter also.

d. Send your approval letter, the dated Stability letter, and all of the copies of the operating manuals to the CID for signature.

e. When everything is signed.....Keep one signed copy of the operating manual, a copy of the dated Stability Letter, and a copy of your letter for the vessel's operating manual file (located in the new construction office). Send the original letter, the original dated Stability Letter, and all other signed operating manuals to the company. Send a copy of your letter, a copy of the Stability Letter, and a copy of the cover sheet of the "APPROVED" operating manual to MSC. If ABS gets a copy, send them a copy of your letter and a copy of the dated Stability Letter.

7. If you have returned the operating manuals for revision, record your hours on a separate sheet of paper and put that sheet of paper in the vessel's operating manual file. Those hours will be added into the time spent reviewing the revision after the company revises the manual.

8. If you are approving the operating manual (with or without comments), all you have left is the MSIS part. Use MISF to create an "ADMIN" case. Add in any hours spent reviewing earlier revisions. Note that when completing the MIAR, you will be amending the vessel's COI. The amendment should read "CORRECTED STABILITY LETTER ISSUANCE DATE". Use VFSL to add (or change) the stability letter information on the COI. For VFSL, the issuing office is "GMSC" and the approval date is the date you stamped on the Stability Letter. Use VFOD to delete any endorsements that are no longer applicable such as:

a. "VESSEL IS TO BE OPERATED IN ACCORDANCE WITH ITS CURRENT OPERATING MANUAL." - This referred to earlier versions of the operating manual that were temporary pending CG approval.

b. "VESSEL IS LIMITED TO A FREEBOARD OF NOT LESS THAN TWO (2) FEET AMIDSHIPS UNTIL A U.S. COAST GUARD STABILITY LETTER IS ISSUED."


T. C. CHRISTIAN

Attached: CHECKLIST FOR REVIEW OF LIFTBOAT OPERATING MANUALS

CHECKLIST FOR REVIEW OF LIFTBOAT OPERATING MANUALS

1. The applicable requirements for liftboat operating manuals are contained in NVIC 8-91. However, NVIC 8-91 provides little amplifying information that will assist you in your review.
2. There are three basic formats for manuals that owners appear to use based on review of 15 different vessels. The first is that used by OTIS, a subsidiary of Brown & Root. This is the best example of the formats in use because the manual follows a logical and easy-to-follow arrangement of topics. Sample loading calculations are straightforward and information on vessel limitations (jacking & transit) are clearly presented. The second format is that developed by M.D. Korkut Assoc., & Marine Engineering Consultants in New Orleans. Their format is also logical but their wording is a bit harder to understand. Sample loading calculations are more involved than they should be for operator use. The third format is a kind of free for all in which the owner may include a lot of extraneous topics (i.e. from sexual harassment to engine maintenance) along with the pertinent information or he may present a base line version lacking necessary information such as sample loading calculations.
3. Your review should concentrate on two major areas. The first is verifying that the owner has provided information in NVIC 8-91. The second area is less well defined and involves looking at the operating manual from the standpoint of the operator. Ask yourself "does this instruction make sense, is it sufficiently detailed to provide guidance in operating the vessel safely within it's operating limits".
4. Since this is the first go around on operating manual submissions there are numerous discrepancies ranging from minor to major. Usually these discrepancies are very consistent for a particular operator like OTIS or even someone using the Korkut format. So you will end up recycling your comments.

5. Below is a list of items and specific areas that should be covered in the operations manual. You should look to make sure each of these items have been covered.

- ___ A. (MANDATORY) Table of contents and general index.
- ___ B. (ALL MANDATORY) Vessel description.
 - ___ 1. Brief written description of vessel.
 - ___ 2. Major dimensions - length, width, depth, height of legs.
 - ___ 3. Variable load capacities - liquid and deck cargo, and hook load.
 - ___ 4. Full load draft and displacement.
- ___ C. Limiting design data for each mode of operation
 - ___ 1. (MANDATORY) Draft, air gap, wave height, wind, current, temperatures, and other environmental factors. Note: Check if air gap is greater than wave height, if not make comment to provide sufficient clearance between hull and wave height.
 - ___ 2. (RECOMMENDED) Wave period.
- ___ D. (ALL MANDATORY) Crossflooding.
 - ___ 1. Information concerning the use of any special crossflooding fittings.
 - ___ 2. Location of any valves that may require closure to prevent progressive flooding.
- ___ E. (ALL MANDATORY) Bilge system.
 - ___ 1. Description and diagram of the bilge system.
 - ___ 2. Guidance for the operation of the bilge system and of the alternate means of bilge system operation.
 - ___ 3. Description of their limitations (such as spaces not connected to the bilge system).
- ___ F. Jacking operations.
 - ___ 1. (MANDATORY) Preparations for the vessel to make a move.
 - ___ 2. (MANDATORY) Information on how to avoid structural damage during heavy weather from shifting loads.
 - ___ 3. (MANDATORY) Limiting sea state for jacking down (wave height & wind speed).
 - ___ 4. (MANDATORY) Instructions for ascertaining & correcting abnormal list and trim after jacking down including consideration of leg flooding.
 - ___ 5. (MANDATORY) Instructions for preloading using ballast when sail conditions dictate. Note: preloading is generally done by sequentially filling tanks and allowing vessel to settle before jacking to operating level.
 - ___ 6. (RECOMMENDED) Instructions not to rock or twist vessel if pads are stuck in mud.
 - ___ 7. (RECOMMENDED) Instructions not to shift deck loads while afloat.
 - ___ 8. (RECOMMENDED) Instructions to close all WT doors, hatches and unused vent covers before jacking down.
 - ___ 9. (RECOMMENDED) Instructions on raising and lowering legs simultaneously.
 - ___ 10. (RECOMMENDED) Instructions to level vessel when jacking up.
 - ___ 11. (RECOMMENDED) Instructions no to submerge deck to break legs free from mud.

- _____ 12. (RECOMMENDED) Instructions for all personnel to wear life preservers whenever jacking operations occur.
- _____ G. Afloat storm preparation.
 - _____ 1. (MANDATORY) Guidance for preparing the unit for a severe storm and what to do when bad weather conditions are forecast.
 - _____ 2. (MANDATORY) When critical events or decisions should be accomplished, such as when to leave the area and head for safe refuge, or evacuate the vessel.
 - _____ 3. (RECOMMENDED) Monitoring of weather forecast to proceed to successively higher levels of preparation.
 - _____ 4. (RECOMMENDED) Instructions for all personnel to wear life preservers.
 - _____ 5. (RECOMMENDED) Evacuate personnel from machinery spaces below deck.
 - _____ 6. (RECOMMENDED) Fasten all loose items on deck.
 - _____ 7. (RECOMMENDED) Close all WT vent covers and other openings.
 - _____ 8. (RECOMMENDED) Place generators on line or in standby.
- _____ H. (ALL MANDATORY) General arrangement plans showing location of:
 - _____ 1. Watertight and weathertight compartments and openings in the hull and structure.
 - _____ 2. Accesses to different compartments and decks.
 - _____ 3. Vents, and closures including mechanical, ventilating, and electrical emergency shutdowns
 - _____ 4. Flooding and level alarms.
 - _____ 5. Fire and gas detectors.
- _____ I. (ALL MANDATORY) Emergency Shutdowns
 - _____ 1. List of emergency shutdowns.
 - _____ 2. Guidance on restarting all mechanical, ventilating, and electrical equipment after activation of the emergency shutdowns.
- _____ J. (MANDATORY) Diagram of the emergency power system.

INSPECTION OF LIFTBOATS

- REF: A) NVIC 8-91
B) CID MEMO 17, Inspection policy for OSV less than 100GT, sub "I" or "T"
C) 46 CFR 90-105, sub "I", vessels Certificated prior to 18MAR1998
D) 46 CFR 125-134, sub "L"
E) D8 Policy letter Dated 09OCT98 "PERSONS ALLOWED ON LIFTBOATS"
F) D8 Policy letter Dated 12NOV98 "RESCUE BOAT REQUIREMENTS ON OSVS"
G) CID MEMO 19, INSTRUCTIONS FOR REVIEWING LIFTBOAT OPS MANUALS
H) NVIC 7-68

Cancellations: NONE

1. With the publication of Subchapter "L" there have been numerous regulatory changes affecting the inspection of liftboats. Liftboats fall under the same regulatory standards as conventional OSV's; however, there are several areas of inspection that are unique to this type of vessel. This guidance is designed to help address these liftboat specific differences and aid the inspector in the interpretation and application of these regulations.

2. Specific Policy Decisions

a. Engineering Related Policy:

(1) Bilge alarms- Required in all engineering and machinery spaces. An audible and visual alarm for each space shall be provided at the pilothouse and shall be properly marked. No devices may be installed to disable these alarms.

(2) Engine Overspeeds- Engine overspeed devices on all prime movers are grandfathered. If installed, they must operate properly and be tested.

(3) Ventilation shutdown- Required on all power ventilated equipment including heat pumps and other such devices used in hotel services. Natural vents connected to the engine room and deckhouse are required to have weathertight enclosures and shall be appropriately marked, "Close in Case of Fire."

3. Deck/Hull , Drydocking Policy:

(1) Percentage of Wastage Allowed- Liftboats are weight specific vessels, they were and are built with over all weight to be kept to a minimum. This reduction in weight in the past led to many older liftboats being built to reduced scantlings as

compared to conventional hulled vessels of the time. For newer liftboats (none public law), formal wastage allowed as per NVIC 7-68 is 25%, however, for older liftboats, built to lighter scantlings, will require a subsequent reduction in percent of wastage allowed. These older liftboats were in service for several years prior to their requirement to be inspected, consequently these vessels were built without approved plans and no section modulus calculations provided. As a result, there are three unique categories of liftboats when considering wastage allowances.

a) Vessels built to sub "L" & "I" standards with approved plans, allowed 25% wastage per NVIC 7-68.

b) Vessels built without approved plans, to minimum ¼" maindeck and hull bottom plate and 3/16" side shell plate, allowed 20% wastage; all vessels greater than 20 years in service, gauging required every other drydock (once every five years).

c) Vessels built without approved plans, 3/16" or less on main deck and hull bottom plate, less than 3/16" on side shell plate, allowed 10% wastage, all vessels greater than 20 years in service (the majority of these vessels will fall into this group), gauging required every drydock.

(2) Tailshaft intervals- All liftboats that are less than 100 gross are not required to pull shafts for examination. All other liftboats of greater than 100 GT will be required to undergo tailshaft examinations as regulations.

(3) Unique criteria to be checked at drydock- Liftboats spend the majority of their service life jacked up out of the water; as such, special attention must be paid to these items:

a) Pads- These connections at the bottom of the legs are the main load bearing area of the vessel; the entire pad, (top, bottom and all sides) needs to be visually inspected for damage/insets, by "dry docking" or some other "alternative" methods acceptable to the M.I. The leg-to-pad connection (welds) and the can-to-pad connection (welds) must be NDT tested at every drydock or anytime the vessel has had an incident involving stress in these areas.

b) Leg Tower sponsons- The area above the leg pad on the hull must be checked for insets and fractures; often debris will be on the pad when the leg is retracted and will cause hull damage in these areas. This area is critical to the support of the leg and tower; if insets are deep or numerous, the area must be cropped and renewed and access must be provided in the leg sponson to ensure the internal framing is not tripped or fractured.

c) Legs and Leg Rack- The leg rack is another critical area of the vessel. This is where the hydraulic motor drive gear meets the mechanical leg rack. Great amounts of torque are applied to this area on a regular basis. The racks must be

inspected for chipped, missing teeth, and excessive rack-to-gear wear. The legs should be inspected for significant creases, dents and deflections. These can increase the rack to gear clearance and allow the gear to free wheel, causing the vessel to descend uncontrollably.

C. Lifesaving Policy:

(1) Rescue Boats- Required on all liftboats regardless of length and tonnage on all coastwise and oceans routes. All rescue boats installed on pre sub "L" vessels must be equipped per MSO Morgan City policy letter Serial# M-00010 dated 11JAN00 with (2) paddles, (2) heaving lines, (2) sponges, (1) boat hook, (1) bailer. All rescue boats installed on sub "L" vessels must have full SOLAS outfitting as designated in 46 CFR 133.175.

(2) Rescue Platforms- While liftboats were allowed to use the installed cranes for the launch of rescue boats in lieu of an installed davit, stability concerns and the vessel's operations manual prohibit the use of the cranes while the vessel is underway. The vessel must be equipped with a means to recover a helpless person while underway. This can be accomplished in several ways depending on the vessel's hull design. Older vessels have leg pads that retract up to the hull and are exposed when underway. These can be used as a rescue platform provided a suitable means is installed to access the pad and a means is provided to remove the helpless person to the main deck. On many newer vessels, the pad is submerged while underway, and a rescue platform must be provided. These platforms will vary from hull to hull design, and it will be up to the inspector's discretion to deem the platform fit for service. A rescue harness must also be provided regardless of platform type.

(3) Smoke Alarms- Required in each separate living space and galley. May be battery powered independent type units. Must have a test switch.

(4) Embarkation Devices- Embarkation ladders (Jacob's Ladders) are not required on liftboats. It has been a long standing industry practice that these vessels installed knotted man ropes for emergency embarkation. These knotted man ropes are allowed and encouraged though not required. This issue was one that was hotly debated from 2001 to 2003 between the CG and the liftboat community. MSO Morgan City highly desired to have Jacobs ladders installed and felt that knotted ropes were not a sufficient lifesaving device. However, after much consultations with District Eight, various Coast Guard HQ senior level decision makers and with the Chief of the CGHQ Lifesaving and Fire Safety, COMDT(G-MSE-4), a final decision was made on 17 January, 2003 (via email) that knotted ropes or no ropes will suffice as adequate embarkation aids.

a.) The industry position is the Jacob's ladder is a redundant lifesaving device. Egress from a liftboat in an emergency will be to a nearby platform or rig, or by crane and Billy Pugh to the water and a waiting vessel. The rope ladder is designed for the crane operator, the last person off, to have a means for his or her escape.

b.) If a knotted rope is to be installed, it shall be long enough to reach the water at the liftboat's highest elevated position, and be examined by the vessel's crew at least annually. Soiled, worn or frayed ropes and worn, cracked or dully corroded attachments shall be replaced immediately.

D. Fire Fighting Equipment Policy:

(1) Fire Pumps- All liftboats must have an installed fire pump, and its output is regulated under the appropriate sub chapter. These fire pumps are of the submersible type, are mounted on the main deck, and connected to the fire main system through a flexible hose. The condition and serviceability of these flex hoses must be inspected. The launch appliance for lowering the pump into the water must also be inspected for proper operation and condition.

E. General Operations:

(1) Level Alarm- All liftboats should be fitted with a level indicator to indicate change in vessel level height; a distinct alarm that sounds at the main operating station should be in place to warn of uneven leg sinkage when elevated.

(2) Low Hydraulic Oil Level Alarm- All liftboats should be fitted with an audible and visual alarm at the main operating station that indicates a loss in hydraulic oil level in the main jacking system.

(3) Operations Manual- All liftboats must have an approved Operations Manual onboard; see CID Memo 19.

(4) Dead Man Feature- The liftboat jacking system must incorporate a dead man feature at the system controls. What this means is that physical force from the operator (through hand and or foot pedal) must be applied to the controls in order for the system to function. When this force is removed, the system stops jacking. Often this is done through use of a foot pedal or spring-loaded hand toggles.

(5) Anemometer- If the liftboat's manual requires actions based on wind speed the vessel must have an anemometer (portable or fixed) on board.

(6) Anchors- Anchors are required and sized as per ABS rules for building and classing liftboats. Liftboats are restricted in their routes through their Operations Manual to water depths that do not exceed the vessel's ability to jack up. However, if a liftboat loses steering or propulsion in a river current the liftboat may travel a significant distance before the legs can be jacked down to stop the vessel. These anchors have been referred to as emergency anchoring systems. MOC policy letter dated 24MAY89 states that a liftboat anchor weight be calculated as $W(\text{weight of anchor})=0.5 \times \text{maximum horse power on one shaft}$ or $W= [\text{length}*(\text{Beam} + \text{depth})]/12$, whichever is less.

F. Cranes:

- (1) All liftboat cranes must have the following basic features:**
 - a) Load charts for the specific crane installed showing both dynamic and static loads.**
 - b) Safety hand signal charts.**
 - c) All controls properly labeled.**
 - d) Provide a boom angle indicator.**

- (2) All liftboat cranes must be load tested; intervals are based on the subchapter that applies. All cranes must be load tested after any major repairs. Most liftboat operators now currently load test annually for insurance reasons, and many of the major companies that they work for require it.**


G. J. TOLBERT

5 Year

- **Rack** – Visually inspect rack length equal to twice tower height, but not less than 20 ft above tower and one random location (rack must be free of all coatings). If unable to make the required length available for inspection, then the owner or operator should provide an alternative inspection plan.
- **Rack Butts** – Clean and inspect (NDT required) rack end butts on all legs.
- **Pinion** – Inspect pinion and adjust (as needed) pinion to rack clearance, and record results.
- **Gearbox Oil** – Draw oil sample/analyze from every gearbox, and record results.
- **Gearbox Disassembly** – Disassemble and inspect lower-most gearbox per leg; additional inspection based on results.

10 Year

- **Rack** – Conduct visual inspection and NDT of entire rack length, rack must be free of all coatings, record completion. Conduct NDT of rack to leg welds, entire length of rack and record results.
- **Rack Butts** – Clean and inspect (NDT required) rack end butts on all legs.
- **Pinion** – Check and adjust (as needed) pinion to rack clearance, and record results.
- **Gearbox Oil** – Draw oil sample and analyze from every gearbox, and record results.
- **Gearbox Disassembly** – Disassemble and inspect lower and uppermost gearbox on each leg, additional inspection based on results.

Lift Boat Leg Inspections - 5 and 10 year lift boat leg inspections should be documented on the vessel's COI to show "last completed" for each leg.

• 5 Year

Bearings – Bearing and cap inspection on lower gearbox pulled for disassembly; additional inspection based on results.

Brakes – Inspect brake assemble of pulled /lower-most gearbox per leg; additional inspection based on results.

Tower Guides – Inspect tower and rack guide's clearance, and compare with manufactures recommendations.

Leg to Pad Connection – Clean and NDT all leg to pad connection welds; evaluate connection integrity.

• 10 Year

Bearings – Inspect bearings and caps on gearboxes pulled for disassembly; additional inspections based on results.

Brakes – Pull and inspect two brake assemblies on gearboxes pulled for disassembly; additional inspections based on results.

Tower Guides – Inspect tower and rack guide's clearance, and compare with manufactures recommendations.

Tower Roundness – Inspect tower roundness at several locations to ensure within manufacturer tolerances.

Tower Thickness – Evaluate tower wall thickness by conducting grid on tower using NDT (UT), and record results.

Leg to Pad Connection – Clean and NDT all leg to pad connection welds; evaluate connection integrity.

Lift Boat Leg Inspections - 5 and 10 year lift boat leg inspections should be documented on the vessel's COI to show "last completed" for each leg.

• 5 Year

Hydraulic Hoses – Replace all external hydraulic jacking system hoses exposed to weather locations.

• 10 Year

Pad Plate Thickness – Evaluate pad shell plate thickness by performing UT grid; inspect all plug welds.

Hydraulic Hoses – Replace all external hydraulic jacking systems hoses exposed to weather locations.

Legs External – Clean entire leg of coatings, NDT all leg butt weld joints, and record completion. Conduct UT bands of leg plate thickness in minimum of four places, and record results.

Legs Internal – Remove pad from leg, visually inspect all leg internals, ladder points, butt welds, etc.; if visual inspection reveals areas of concern, appropriate means of nondestructive testing should be utilized to further inspect these areas.

Lift Boat Leg Inspections - 5 and 10 year lift boat leg inspections should be documented on the vessel's COI to show "last completed" for each leg.

Subject: Questions concerning Inspection requirements on liftboat cranes:

The crane workshop I recently attended revealed a lack of understanding by industry as to what requirements and regulations apply to liftboat cranes. The workshop was held by the Mineral Management Services (MMS) and industry, it was prompted by the large number of accidents involving cranes in the oil field. Cranes are often overlooked during an inspection, we normally take the third party invoice of inspection and that's about the extent of the cranes' inspection. The crane on a liftboat is probably the single most important piece of equipment on the vessel, without it in good working order the vessel is no more than a self propelled barge! There are three inspection categories that most liftboat cranes fall into, inspected under NVIC 8-91, 46 CFR subchap I, or 46 CFR Subchap L. Most of you are already aware of these differences but due to the comments and confusion I received from industry such as why aren't liftboats held to the same standards as the rigs they are working, what are the inspection requirements of older vessel cranes, why do some liftboat cranes require anti-two block devices and some don't, etc. I would like to try and clarify some of these questions so that this information can be passed to industry.

NVIC 8-91- Is the least restrictive, it mainly deals with the original "bringing in" of the liftboat fleet, there are still some boats out there that fall in this group, the basic requirements are:

- 1) Crane must be tested to 46 CFR 107.260, and states every 48 months, or after repairs.
- 2) That a correct load rating chart is being used.

Sub Chap I- Is a little more restrictive, 91.37-3 defines "cargo gear" as cranes, that are used for loading and unloading a vessel, it does state that cranes used for construction work are exempt, but liftboats routinely use their cranes for on and offload of cargo.

- 1) 91.37-1 (b) Requires a through examination of assembled gear at least once in every year.
91.37-3 defines "through examination" as visual examination, done by the MI or a third party service report.
- 2) 91.37-1 (d) requires load test every 5 years:
- 3) 91.37-35 Requires wire rope cert. to be kept onboard.
- 4) 91.37-45 (b) Requires load chart to be posted visible to operator.

Sub Chap L- By far the most restrictive, incorporates the American Petroleum Institute (API) RP 2D standards thru incorporation by Subchap IA. It lists the following sites as applicable:

- 1) 107.259 Crane must be inspected and tested to API sec 3 RP 2D, except the load test.
- 2) 107.260 Load test every ⁵4 years, and after repairs.
- 3) 108.601 a) Crane design must meet API req.'s (anti-two block device, etc.)
b) Each crane control must be marked as to its function
c) Instruments must be illuminated
d) Spark arrestors fitted on engine exhaust pipes
- 4) 109.437 Must maintain onboard a crane record book with following following entries:
a) Crane description, data plate info, etc.
b) Dates of all inspections, load tests, wire rope, hooks, replacement, date of failures of any crane components
c) Dates of all repairs to crane
- 5) 109.439 The following certs must be maintained on vsl; cert's issued by crane certifying authority, wire rope cert.s

- 6) 109.521 Master shall ensure cranes are operated & maintained as per API RP- 2D
- 7) 109.525 Load chart must be posted at crane operating station
- 8) 109.527 Master shall designate in writing all crane operators and insure all operators are familiar with API RP 2D first addition "Recommended practice for operation of Offshore cranes" first addition.

These are the minimum requirements, most of the large oil companies require liftboats contracting with them to use the API RP 2D standards prior to commencing work with them. Some of the things to look for when conducting an inspection, when reviewing the third party load test and service reports look to see if anti-two block devices are installed, weight load indicators if installed are checked and no deficiencies noted, when wire rope is changed a rope cert. accompanies. Ensure that the load chart provided matches the actual set up of the cranes IE., 6 part 8 part etc. look for some form of operator designation or company training, most companies have some way of testing depth perception and ability, documentation is normally in the form of a certificate issued by that company. LT Mike Farrell addressed the fact that there is no standard for crane operators or similar "license" to the MMS representative, he said it would be reviewed. One last thing, question the operators and see if they know the difference between static load and dynamic load and how that affects their max. loads, you would be surprised at the answers you receive from "trained operators", dynamic basically being any lift from an afloat vessel or to an afloat vessel, static being from a platform or liftboat in a jacked up position.

I hope this helps answer some of the questions pertaining to liftboat crane inspection requirements.