THE CRANE CORNER

Navy Crane Center Technical Bulletin

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A WORD FROM TOPSIDE

Tim Blanton

In the newly issued June 2016 NAVFAC P-307, there is a requirement for some activities to develop and maintain a crane replacement and modernization program. Although a new requirement in NAVFAC P-307, some Systems Commands have already recognized the importance of having a plan in place to replace or upgrade aging equipment to ensure mission is not impacted.

Although all activities are encouraged to have a crane replacement and modernization plan, those activities with category 1, 2, or critical category 3 or 4 cranes are required to assess their crane inventory and determine whether or not the inventory is sufficient and reliable to meet their current and future mission requirements. Shortcomings and vulnerabilities should be identified in the plan and the plan must be updated annually. For those of you that have not heard the term "critical cranes," as defined in the new revision to NAVFAC P-307, a critical crane is one that performs work under the cognizance of NAVSEA 08 (Naval Nuclear Propulsion Program), an ordnance-handling crane, a hot-metal handling crane, a crane that handles high value or one of a kind loads, or any crane the absence of which would significantly jeopardize the activity's mission (as determined at the activity level).

The crane replacement and modernization plan provides the activity a tool to not only identify crane inventory vulnerabilities, but also to identify priorities. The identification of priorities and a good business case analysis for a new or overhauled crane are required to support your request for funding. After a specific need (and funding) are identified and a need date for a new crane (or crane overhaul/upgrade) is known, a determination needs to be made on how the crane/crane overhaul will be procured.

There are multiple methods of procurement that can be used for replacing or overhauling cranes, such as self-procurement by the activity, procurement by the Navy Crane Center (NAVCRANECEN), and the use of the NAVCRANECEN waiver process to perform self-procurement of cranes where procurement by NAVCRANECEN is required. There are specific requirements for each of these procurement methods, and those requirements can be found in NAVCRANECENINST 11450.1B. For category 2 and category 3 cranes, NAVCRANECEN estimates from the time funding has been established it takes six months to have a contract awarded and one year from contract award until the crane is ready to be accepted by the government. These estimates, however, are very general and may change drastically with the

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crane type, complexity, capacity, span, and numerous other factors. For more specific estimates on acquisition timelines or for any other questions regarding crane procurement, NAVCRANECEN has a team of design engineers, project managers, and acquisition specialists that can assist regardless of whether NAVCRANECEN is the Procuring Contract Office.

In today's budget-conscious environment and with reduced funding, having a plan in place to replace and overhaul cranes is no longer just a good idea, it is becoming a necessity. From establishment of a process to determine when a crane requires replacement through development of a procurement strategy, obtaining funding, and ultimately crane acceptance and certification, having a crane replacement and modernization plan is an essential management tool in ensuring that valuable Navy crane assets will be available when needed to perform the mission.

TIP OF THE SPEAR
THIRD QUARTER FY16 EVALUATION SUMMARY

SUMMARY OF PROGRAMS EVALUATED

66 Navy Weight Handling Equipment (WHE) programs were evaluated. Equipment reviews were performed at two remote deployment sites.

61 Navy programs were fully satisfactory.
5 programs were marginally satisfactory.

100% satisfactory rate (100% for the first three quarters of FY16).

SATISFACTORY CRANES

36 of 52 cranes were satisfactory (69%).
Total for three quarters: 127/170 (75%).

REASONS FOR UNSATISFACTORY CRANES

- Improper check of hoist secondary limit switch (five cranes).
- Hoist brake out of specification (two cranes).
- Mismatched load bearing fasteners not evaluated (two cranes).
- Building obstruction in way of crane (two cranes).
- Damaged/leaking boom hoist cylinder seal.
- Oil seeping on hoist brake.
- Reeving configuration not tested.
- Hoist hook would not rotate smoothly.
- Under-voltage condition on diesel engine.
- Trolley trunnion pivot bolt nut loose.
- Hoist does not have a secondary braking means.
- Hoist and travel drive chain measurements out of specification.
- Wire rope crushed on drums of mobile boat hoist.

EVALUATION ITEMS

Significant Items. A significant item is an issue that the evaluation team determined to be a higher level area of concern that presents a significant deficiency or vulnerability to an activity's weight handling program. Significant items typically require immediate management attention to address, evaluate, and determine effective corrective actions to mitigate the deficiency or vulnerability. Thirteen activities received one or more significant items. The items identified include:

- Weaknesses in government oversight of the base operating service contractor's program.
- Lack of management and supervisory oversight.
- Improvements needed in weight handling program leadership.
- Crane accident severity.
- Weaknesses in crane certification attention to detail.
- Manning vulnerability.
- Multiple hoists without secondary braking means.
- Overall weaknesses in weight handling program management.
- Continued weakness in accident and near miss identification and investigation.
- Level of knowledge weaknesses.
- Lack of surveillance program.

COMMON EVALUATION ITEMS (FIVE OR MORE ITEMS)

- Lack of surveillance program or established program that needs improvement - 32 items.

- Various unsafe crane and rigging operations observed by the audit team (side loading, unattended load, standing/walking beneath load, operating without signals, poor signaling, pinch points, slings bunched in hooks, load not balanced, no synthetic sling protection, brakes not checked at start of lift, side loading of shackles, trackwalker out of position, swivel hoist rings not torqued, trolley racked to one side, etc.) - 27 items.

- Operators/riggers/test directors lacked essential knowledge (recognizing crane accidents, complex lifts, knowing the weight of the load, how to connect special equipment, etc.) - 24 items.

- Daily and monthly pre-use checks and simulated lifts performed incorrectly or nor performed - 21 items.

- Inspection and certification documentation errors - 18 items.

- No procedure for tagging equipment with known deficiencies and/or tagging equipment that is out of certification - 17 items.

- Lack of (or low number of) lower order crane accident and near-miss reports - 16 items.

- Rigging gear/crane structures/other section 14 equipment not in the program or lack documentation - 16 items.

- Local weight handling instruction non-existent or inadequate - 15 items.

- Operator license/file discrepancies (no objective quality evidence (OQE) of performance exam, examiner not licensed, no OQE of safety course, no OQE of operation to waive performance test, course not signed by examiner, course improperly graded, corrective lenses not noted, course not graded, licensed for more than two years, license not in possession of operator, operating with expired license, operating with no license) - 13 items.

- Poor inspections/inspection processes (including inspector removing load bearing fasteners voiding certification, inspections not performed, work documents not available for in-process inspections, unsafe practices, wire rope not inspected completely, fall protection personal protective equipment (PPE) not utilized, deficiencies not identified) - 12 items.

- Deficient or worn rigging gear (including noncompliant gear) - 10 items.
- Unrecognized/unreported accidents or near misses (including damaged gear not investigated for cause) - 9 items.

- Rigging gear, containers, brows, test weights, etc., not marked properly or marking not understood by riggers (including illegible marking, mismatched components, pin diameter not marked on alternate yarn roundslings) - 8 items.

- Staffing issues (shortages in critical areas, no succession planning, accident prevention team staffing, high turnover of military personnel, inadequate engineering support, total reliance on remote contractor) - 8 items.

- Training issues, including contractor personnel, (training not taken, refresher training not taken or not taken within three months of license renewal, lack of inspector training) - 8 items.

- Crane improperly stowed/secured (hook block in or too close to upper limit switch or stowed in path of traffic, machines, etc., power not secured) - 6 items.

- Lockout/tagout violations (PPE not used for energy check, verification not performed, supervisor’s annual review not performed, hazard analysis not performed for PPE requirements) - 6 items.

- Crane load test issues (load test not performed after replacement of load bearing part, test instructions not clear or complete, damaged test weights, lift attachments not marked for multiple/stacked weights, test radius incorrect, inefficient test weights, incorrect test load, load moment indicator not re-verified after bypassing, insufficient test personnel, excessive load testing, weighing equipment for test weights not traceable to the National Institute of Standards and Technology, not all load bearing/load controlling/operational safety device components tested, no restraint used for single eye-to-eye wire rope sling) - 6 items.

- Rigging gear/section 14 gear load test issues (load not held for prescribed time or duration not noted, documentation missing, not tested properly, not tested, pin diameter not identified) - 6 items.

- Expired or non-program gear in use or not segregated from in-service gear - 5 items.

- Poor oversight of contractor responsibilities - 5 items.

- Poor maintenance practices or maintenance/inspection not performed as required (significant corrosion evident, parts not tagged/bagged, hazardous materials not properly stored, work documents not available, lubrication not per schedule, lack of long-range maintenance schedule) - 5 items.

- Crane marking issues (monorail tracks not marked with rated capacities, directional signs not marked on crane, crane capacity incorrectly marked, hook not prominently identified, electrical equipment not marked per National Electrical Code) - 5 items.

NAVFAC P-307 JUNE 2016 IS NOW AVAILABLE

The latest revision of NAVFAC P-307, Weight Handling Program Management, was issued on June 21, 2016. It is available for download at Navy Crane Center's web site, https://www.navfac.navy.mil/ncc. Some of the highlights of this revision are:

1. The title was changed to "Weight Handling Program Management" to more accurately reflect the overall guidance provided. This version includes the addition of a section on program management, providing guidance for the overall management of an activity's weight handling program.

2. Clarifications and updates were made to the entire manual to ensure compliance with the latest Occupational Safety and Health Administration's weight handling requirements and closer alignment with the latest ASME and industry standards.

3. Certain testing and inspection requirements for rigging gear were relaxed to reflect industry standards (based on Navy data showing no safety concerns), which will provide significant cost avoidance opportunities.

4. We incorporated appropriate Crane Safety Advisories, Equipment Deficiency Memoranda, and Requests for Clarification, Deviation, or Revision issued/received since the previous revision.

5. Contractor crane surveillance requirements were strengthened, including new requirements for personnel hoists used in antenna/communications tower construction.

6. The nominal test load for mobile cranes was reduced to 100 percent of rated load, and we changed the test load tolerance for all cranes from +5/-0 percent to +0/-5 percent.

7. Operator licensing requirements were consolidated into one section. Written examinations will now be developed locally and should be based on operating characteristics and features of the activity's cranes and its unique mission requirements. For performance tests, we now require tests based on crane types and capacities.

8. Numerous updates, clarifications, and additions were also made to the operations and accidents sections.

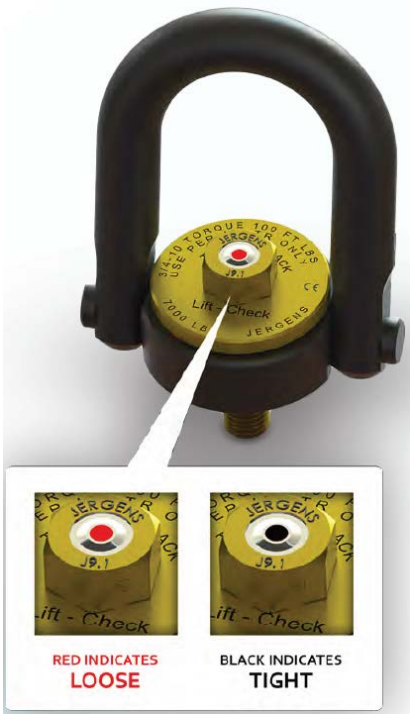
These are just highlights of significant changes. A careful reading of the entire manual is required. Navy shore activities shall be in full compliance within one year. Administrative changes to activity documents to ensure they comply with the new section and paragraph numbers shall be completed within three years.

Navy Crane Center will be issuing a series of Weight Handling Training Briefs in the coming weeks and months, providing additional information on selected changes. Navy Crane Center will also be updating the web site with P-307 2016 forms and a frequently asked questions page to assist activities in the transition to the 2016 revision.

DID YOU KNOW?

Advances in weight handling equipment are continuously being made throughout the industry. The following are a few items the Navy Crane Center has found that may be helpful to your activity:

Traditional swivel hoist rings require use of a calibrated torque wrench to verify proper installation for full working load. Additionally, as addressed in NAVFAC P-307, swivel hoist rings, in extended use, may experience relaxation of installation torque and require additional torqueing depending on the original equipment manufacturer's instructions. However, a swivel hoist ring is now available with a visual tension indicator that does not need a torque wrench or external calibration for installation. A standard box-end wrench can be used. A swivel hoist ring contains an indicator that changes from red to black when fully tightened. The hoist ring is rated at 5:1 design factor and meets the requirements of B30.26.



In order to ensure that the legs of a multiple-leg sling assembly are not overloaded, NAVFAC P-307 requires that four-point lifts be sized based on either pair of diagonally opposing legs carrying the entire load unless the assembly is equipped with a device that automatically adjusts for equal distribution of the load. A load leveling sling assembly is available that allows the crane hook to be positioned over the center of gravity for non-symmetrical four point lifts, meets all ASME requirements, and can be locked in place for fixed leg lengths. Rated capacities up to 150 tons are currently available. Caution should be used when lifting loads that may shift during the lift.

Wedge socket end connections are commonly used on mobile cranes. Conventional wedge sockets require a load of 95 to 100 percent of capacity to be applied to properly seat the wedge. It is now recognized in the 2016 revision of NAVFAC P-307 that there are B30.26 compliant wedge sockets available that utilize a fastener to seat the wedge, allowing the user to forgo the initial load requirement, saving time and manpower. In some cases, it may be possible to replace the existing wedge with a new wedge kit without replacing the socket.

The purpose of this article is to highlight new and innovative products. The information provided has been extracted from manufacturer's literature and does not necessarily represent the views or opinions of the Navy Crane Center nor does the Navy Crane Center endorse the products that appear in this column.

We are always interested in learning about advances in weight handling equipment. If you have found new technology, please share with our editor at nfsh_ncc_crane_corner@navy.mil.

CRANE SAFETY ADVISORIES AND EQUIPMENT DEFICIENCY MEMORANDA

We receive reports of equipment deficiencies, component failures, crane accidents, and other potentially unsafe conditions and practices. When applicable to other activities, we issue a Crane Safety Advisory (CSA) or an Equipment Deficiency Memorandum (EDM). A CSA is a directive and often requires feedback from the activities receiving the advisory. An EDM is provided for information and can include deficiencies to non-load bearing or non-load controlling parts. A complete list of CSAs and EDMs can be found on the Navy Crane Center's web site at http://www.navfac.navy.mil/ncc.

EDM 109-POSSIBILE CONTACT BETWEEN WIRE ROPE AND SUPPORT ON OLDER MODEL MARINE TRAVELIFT MOBILE BOAT HOISTS

1. Background: The purpose of this EDM is to inform activities that there are wear pads and wire rope brackets available for mobile boat hoists manufactured by Marine Travelift to prevent damage from slack wire rope contacting the support structure on older model machines (i.e., manufactured prior to 2008).

2. An activity reported grooves and paint damage discovered during a maintenance inspection of a 150-ton mobile boat hoist created by the wire rope rubbing the top beams and upper side beams. Marine Travelift confirmed that without a load on the hoist blocks, slack wire rope can rub the frame and groove the unprotected areas. The activity followed Marine Travelift's recommendation to install wear pads and wire rope brackets to prevent further damage to the structure. Newer models of mobile boat hoists have revised rigging configurations or are equipped with the wear pads and wire rope brackets.

3. Navy Crane Center recommends that during the next scheduled maintenance inspection, activities with mobile boat hoists manufactured prior to 2008 by Marine Travelift determine if their machines are equipped with wear pads and wire rope brackets to prevent the slack wire rope from contacting the structure. For activities whose machines do not have wear pads and wire rope brackets, Navy Crane Center recommends assessment of the wire rope travel paths on their mobile boat hoists and if damage from wire rope contact is occurring, contact Marine Travelift (920-743-6202) or their regional representative to evaluate the installation of the wear pads and wire rope brackets. ■

WEIGHT HANDLING SAFETY BRIEFS

*N*avy Shore Weight Handling Safety Briefs (WHSBs) are provided for communication to weight handling personnel. Data analysis indicates a negative trend related to the occurrence of dropped load accidents at naval activities. These types of accidents can result in personnel injury if personnel are not focused on complying with the fall zone avoidance requirements of NAVFAC P-307. This WHSB is being issued as a reminder for all personnel to increase their focus on the fall zone and on the prevention of dropped load accidents.

The WHSB is intended to be a concise and informative, data driven, one page snapshot of a trend, concern, or requirement related to recent/real time issues that have the potential to affect weight handling performance and efficiency. The WHSB is not command specific and can be used by your activity to increase awareness of potential issues that could result in problems for your weight handling program. The WHSB can be provided directly to personnel, posted in appropriate areas at your command as a safety reminder to those performing weight handling tasks, or used as supplemental information for supervisory use during routine safety meetings. Through data analysis of issues identified by accident and near miss reports, and taking appropriate actions on the information we gain from that analysis, in conjunction with effective communication to the proper personnel, we have the tools to reduce serious events from occurring. As we improve the Navy weight handling safety posture, we improve our performance, thereby improving our efficiency, resulting in improved Fleet Readiness! 

Navy Shore Weight Handling Safety Brief!

Title: WORKING NEAR A LOAD OR IN THE FALL ZONE

Target Audience: ALL WEIGHT HANDLING PERSONNEL

FALL ZONE

The area in which it is reasonably foreseeable that partially or completely suspended materials could fall in the event of an accident.

A common fall zone violation involves rigging personnel unnecessarily reaching up for taglines with a load which is under control versus waiting for the load to come down to a lower height where the tagline can be safely reached.

An injury occurred recently when a shipboard antenna fell from its rigging and struck an employee. Improper rigging was determined to be the direct cause of the accident.

- Dropped load accidents have the potential to result in serious injuries and substantial material damage/costs. Fortunately, dropped load accidents are infrequent; however, nine dropped load accidents have been reported this FY including one that resulted in injury.

- Although the majority of dropped load accidents do not result in injury, the weight handling community must recognize the serious potential and be vigilant in keeping personnel clear of the fall zone. This brief serves as a reminder that dropped loads can and do occur. It is your job to minimize the potential by following established standards and requirements.

Do not get directly under a suspended load!

- Personnel shall remain clear of the fall zone except when actively engaged in rigging or unrigging the load or when the load is being attached to or removed from another object. Once the load is hoisted, rigging personnel shall stand clear of the fall zone.

- There are times when it may be necessary for personnel to reach under a static (not in motion) suspended load for a short duration to install or remove coverings, make attachments, position supports, etc. In this case, the only body parts allowed under the load are the arms and hands. However, even this should be avoided if there are any other alternatives, such as setting the load in a stand. See section 10.7 of NAVFAC P-307 for specific requirements.

26 May 2016

SAFETY

Navy Crane Center 16-S-04

WEIGHT HANDLING TRAINING BRIEFS

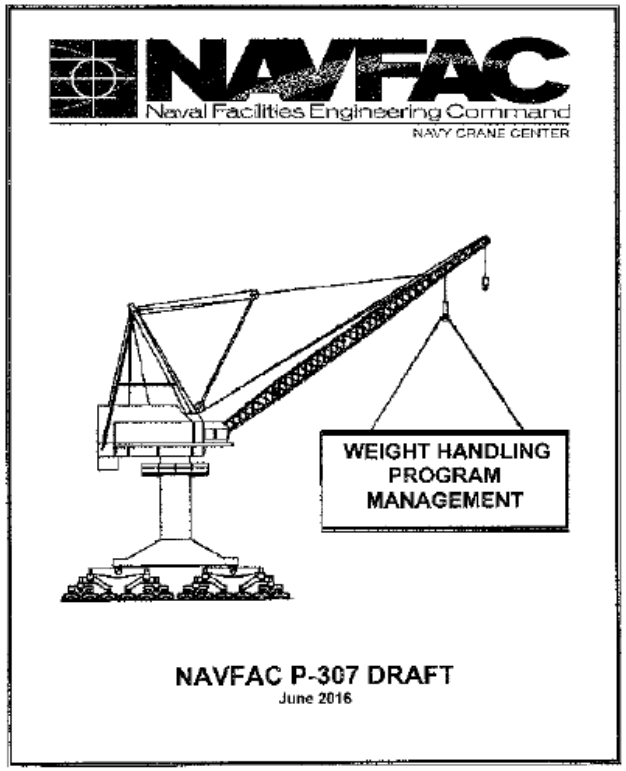
*W*eight Handling Training Briefs (WHTBs) are provided for communication to weight handling personnel. The first WHTB below announces the release of a major revision of NAVFAC P-307. The brief is the first of a series that will discuss publication changes and provide guidance and insight on the new requirements. On 21 June 2016, the revision was signed and is available for immediate implementation. The WHTB can be provided directly to personnel, posted in appropriate areas at your command as a reminder to those performing weight handling tasks, or it can be used as supplemental information for supervisory use during routine discussions with their employees.

When Navy Shore Weight Handling Safety or Training Briefs are issued, they are also posted in the Accident Prevention Info tab on NCC's web site at: http://www.navfac.navy.mil/ncc.

Navy Shore Weight Handling Training Brief!

Title: New Major Revision to NAVFAC P-307 Issued!!!

Target Audience: All Weight Handling Program Personnel



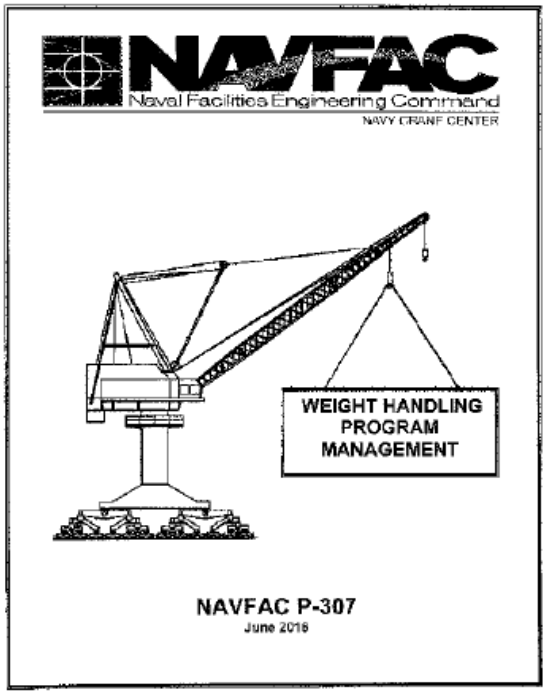
- **On 21 June 2016, the new revision to NAVFAC P-307 was signed and is available for immediate implementation!** Although technical changes are not required to be fully implemented until the one year point, **activities are encouraged to take advantage of several cost savings initiatives that could save the Navy millions of dollars.** For example, with few exceptions, much standard rigging hardware including shackles, eye bolts, swivel hoist rings, turnbuckles, portable load indicating devices, and most links and rings are no longer required to have an initial proof test, unique ID markings, or documented annual inspections and most of this same equipment is no longer required to have the subordinate parts matched to the primary part (e.g., shackle bow and pin). As long as the gear has the minimum ASME B30.26 marking (i.e., manufacturer's name/logo, size, and rated capacity) and passes a satisfactory pre-use inspection, the gear can be used. (See table 14-1 and paragraph 14.8 for specific requirements on all types of gear). As a reminder, this change is only effective for NAVFAC P-307 rigging gear as your specific activity may have additional proof test, inspection, and marking requirements above those required by NAVFAC P-307.
- **Other potential cost savings changes include:** (1) NAVFAC P-307 now allows mechanics/electricians to perform some maintenance inspections, (2) controlled disassembly and reassembly of load bearing/load controlling components (without voiding certification) has been expanded to cover repairs to non-load bearing/load controlling parts, (3) the time limit for certification extensions for emergent conditions has been extended to 60 days, (4) relaxed contractor crane oversight requirements for most commercial truck mounted (and articulating boom cranes) used solely to deliver supplies or for cranes installed on mechanic's trucks used in the repair of shore-based equipment, and (5) some brake and hoist gearing inspection periodicities for category 2 and 3 cranes were increased to coincide with quadrennial load test requirements.
- **The June 2016 NAVFAC P-307 can be downloaded/printed from our website (http://www.navfac.navy.mil/navfac_worldwide/specialty_centers/ncc.html).**
- Over the next several months, we will be issuing a series of weight handling training briefs (WHTBs) which will provide additional guidance and insight on the new requirements.

This WHTB is the second brief of the series and outlines changes in the organization of the manual and changes to Section 1.

Navy Shore Weight Handling Training Brief!

Title: General Overview of New NAVFAC P-307

Target Audience: All Weight Handling Program Personnel



As discussed in last week's WHTB (16-T-02-Module 1), Navy Crane Center will be issuing a series of briefs to better familiarize Navy activities with the changes and new requirements. This training brief outlines the changes in the organization of the manual and covers section 1 changes. These bulletins only cover the more noteworthy changes in the manual and activities should review the entire manual to understand the full scope of the changes and specific requirements.

- **The first thing you most likely noticed is that the title has changed. The new title, "Weight Handling Program Management", better defines the intent and purpose of the manual and contents.**
- In addition to changes to requirements, the entire manual was re-organized for better readability and clarity. Examples include: (1) definitions were removed from section 1 and relocated to Appendix A; (2) contractor crane requirements and third-party certification requirements were consolidated and relocated to sections 11 and 4 respectively; (3) an entirely new program management section was added (section 2); (4) engineering requirements were consolidated and are now all located in section 6; (5) sections 6, 7, and 8 which contained the operator licensing, qualification, testing, and documentation requirements were combined (section 8); (6) and a new section was added to address entertainment hoists (section 13).
- **With regard to section 1 (General Overview), there is only one significant change in requirements as the remaining changes were for clarity and improved organization of the manual.**
  - Portable hoists (manual and powered) used continuously in one location for six months or more (up to 12 months if being used shipboard during an availability) are required to be categorized as category 2 or 3 cranes, depending on capacity. The type of mounting is no longer a factor and the period of use is the only factor used to determine whether a portable hoist is treated as section 14 equipment or a category 2 or 3 crane.

This WHTB is the third brief of the series and outlines new program requirements of Section 2.

Navy Shore

Weight Handling Training Brief!

Title: Weight Handling Program Management

Target Audience: All Weight Handling Program Personnel

Program Management Tools:

- Self-Assessment
- Monitor (Surveillance) Program
- Metrics
- Crane Modernization and Replacement Plan/Inventory Management

The weight handling program manager does not necessarily supervise or manage every weight handling program functional area, but is ultimately responsible for the overall health and effectiveness of the activity's program.

13 July 2016

NAVFAC P-307 2016 now includes a completely new section covering program management. Past versions of NAVFAC P-307 primarily focused on technical requirements, with minimal focus towards program management. Over the years and after completion of hundreds of weight handling program evaluations, it became apparent that in many cases, management of the overall program was needed, particularly in light of sequestration and budget constraints of recent years. As a result, a new section (Section 2) was created, consolidating necessary program management requirements.

- **While all activities are now required to meet certain program management requirements, activities that maintain or operate 100 or more cranes are required to have a designated weight handling program manager.**
  - In most cases, these activities already have someone fulfilling this function.
  - Although not required, smaller activities are encouraged to have someone fulfill the weight handling program manager role, even if as a collateral duty.
  - The position can be shared between two activities (user command and servicing command); however, responsibilities are to be clearly defined and documented.
- **The overall weight handling program is comprised of many functional areas, including program management, operations, rigging, rigging gear, maintenance, inspection, testing, certification, engineering, training, and contractor crane oversight, some or all of which may apply to your specific activity.**
- **The new program management section introduces several new program management tools (upper left corner), some of which will be mandatory at your activity, depending upon crane inventory, mission, and whether or not your activity maintains their own cranes.**
  - Additional insight into each of the specific program management tools will be provided in this series of weight handling training briefs.

Training

Navy Crane Center 16-T-02 – Module 3

This WHTB is the fourth brief of the series and continues discussion of requirements of Section 2.

Navy Shore Weight Handling Training Brief!

Title: Self-Assessment

Target Audience: All Weight Handling Program Personnel

A self-critical self-assessment is a key factor towards improving the performance of an activity's weight handling program. NAVFAC P-307 2016, paragraph 2.4 provides additional guidance to promote improved self-assessment and now requires self-assessments to be performed annually, at a minimum. This updated requirement better supports our goal of continuous weight handling program improvement.

- **As stated above, all activities will be required to perform an annual self-assessment, which is to be made available to the Navy Crane Center upon request (typically 30 days prior to your scheduled evaluation).**
  - Navy Crane Center recommends the activity self-assessment be completed (or updated) at the same time each year (e.g., end of the calendar year, end of the FY, 1 July of each year) to promote consistency in the data.
  - Since your self-assessment may be completed well before your annual or biennial evaluation, NAVFAC P-307 now requires activities to provide an update to the self-assessment (verbal or in writing) if the self-assessment was completed more than four months prior to the scheduled evaluation.
  - Some activities have found it beneficial to provide regular updates to their self-assessments (e.g., quarterly, semi-annually) to review/update the progress being made and to ensure the activity remains focused on known problems areas. This approach is encouraged; however, activities are cautioned not to make too frequent changes to top concerns as it could result in areas not being adequately addressed, resulting in problem recurrence.
  - NAVFAC P-307 has also been updated to incorporate the requirements contained in the pre-evaluation notification, which requires the assessment to include problem areas, suspected causes, and corrective actions planned or already in place.

The self-assessment should be based on (as a minimum):

- **Monitor Program Data/Trends**
- **Internal Reviews/Audits (if performed)**
- **Metrics and Associated Analysis**
- **External Reviews**
- **Changes in Mission**
- **Organizational Goals**
- **Other Known Vulnerabilities**

This WHTB is the fifth brief of the series and continues discussion of requirements of Section 2.5.

Navy Shore Weight Handling Training Brief!

Title: Metrics

Target Audience: All Weight Handling Program Personnel

NAVFAC P-307 2016, paragraph 2.5 includes requirements for basic metrics to better assess cost, quality, efficiency, performance, and safety of the overall program. Required metrics are the minimum but activities are encouraged to tailor their metrics to suit their specific activity.

- **Note that NAVFAC P-307 2016 does not state a specific unit of measure or specify how the metrics are to be determined/defined; instead the requirements are generic/non-prescriptive. This is intentional.**

Required Metrics:

- Crane and Rigging Accidents, Near Misses/Unplanned Occurrences
- Monitor (Surveillance) Program
- Crane Reliability (select cranes)
- Maintenance Cost (select cranes)
- Maintenance Duration (select cranes)

Our evaluation teams will be providing feedback and improvement ideas to your activity; however, we encourage activities to work with "sister" (like) commands to identify "value added" metrics which improve performance.

- NAVFAC P-307 applies to many programs, many of which already have metrics. Prescribing specific metrics hinders continuous improvement.
- For example, with regard to accident metrics, most activities track accident totals/significant accidents, which provides additional metrics such as the significant accident rate (% of total accidents that are significant). However, some activities have advanced metrics to provide a more in-depth look at the types/levels of accidents.
- Crane reliability, along with maintenance cost and duration metrics, play a key role in many areas (cost benefit analysis data to support crane replacement or modernization, identifying the most reliable cranes for critical work, identifying areas of declining performance, etc.)
- Although some "baseline" lagging metrics are needed for historical purposes or higher-level reporting (accident totals, OPNAV reportable events, etc.), the goal should be to develop leading metrics which enable activities to take corrective actions to prevent the problem area from becoming worse.
- Metrics which identify no adverse indications are typically of little use. Do not use metrics to "show how good" your activity is, but instead, use your metrics to identify where your program needs to improve.

SUMMARY OF WEIGHT HANDLING EQUIPMENT ACCIDENTS
SECOND QUARTER FISCAL YEAR 2016

For the second quarter of FY16, 66 Navy weight handling accidents (56 crane and 10 rigging) were reported. Accidents decreased by 20 percent from the first quarter of FY16, and significant accidents declined by 36 percent (9 vs14). Significant accidents (overload, dropped load, injury, two-block, derailment or overhead power line contact) are accidents that have the potential to result in serious injuries or substantial material damage or equipment costs and may require a more detailed investigation. The number of injuries declined but there was one OPNAV Class "C" injury that occurred as a result of a dropped load. Additionally, 13 crane and rigging gear accidents were reported by contractors. Four of the thirteen were significant accidents, but there were no contractor injuries.

INJURIES

Accidents: There was one injury reported in the second quarter. A sailor was injured when he was struck by a shipboard antenna that fell from its rigging during removal.

Lessons Learned: NAVFAC P-307 specifically prohibits personnel from placing any part of their body under a moving load. Personnel working within the fall zone subject themselves to risk of injury when problems occur that affect load control and stability. Supervisors and weight handling personnel must anticipate worst case scenarios and ensure that individuals are well clear of the area in the event of a dropped load and take into account that the load may ricochet. The activity's investigation identified improper rigging as the direct cause of the accident. In addition, the investigation identified contributing issues relating to knowledge weakness pertaining to rigging requirements for antennas and inadequate supervision relating to planning and personnel assignment.

DROPPED LOADS

Accidents: Two dropped load accidents were reported, including one that resulted in the injury discussed above. Both dropped loads occurred as a result of improper rigging. The second dropped load occurred while attempting to turn (flip) a shaft seal when a knot used in the nylon sling came free, dropping the load to the deck.

Lessons Learned: Both of the dropped load accidents were directly caused by improper rigging. The consequences of rigging a component incorrectly are particularly illuminated by the injury discussed above, and all weight handling professionals must focus their attention on eliminating rigging errors. Taking the time to ensure that a component is rigged correctly is a critical first step toward improving weight handling safety. In addition, personnel must be trained to stop if they are not familiar with the appropriate rigging configuration for the job. It was identified that supervision could have played a part in preventing both of these accidents. Supervisors must be engaged at all levels of the job and ensure that personnel assigned have the requisite knowledge and skills to complete the required tasks. Additionally, it is important for supervisors not to assume that just because personnel are qualified, they know how to perform

every task. Supervisors should conduct a thorough pre-job brief and ask specific questions relating to rigging requirements.

OVERLOADS

Accidents: Six overload accidents were reported, five rigging gear overloads and one crane overload. Rigging gear was overloaded on two separate occasions during shipboard removal of a canister adapter. A wire rope sling was overloaded during a boat lift. A lever hoist was overloaded when a lift was commenced without knowing the weight of the load. A mobile crane was overloaded during load test when the test load exceeded the maximum radius allowed for the test. A manual chain hoist was overloaded when riggers encountered a binding condition during a lift. Personnel commenced the lift without knowing the exact weight of the load.

Lessons Learned: Overloads continue to be the most frequently reported type of significant accident. The cause varies, but improper operation is the common theme relating to most occurrences. In two of the six overloads, personnel did not know the exact weight of the load. In addition, one load encountered a binding condition, but personnel were not expecting the binding and had not implemented binding controls required in section 10 of NAVFAC P-307. One of the accidents involved an overload of a lever hoist. The activity identified that a procedure should have been utilized due to the complexity of the operation. The activity also identified that the rigger-in-charge did not know the actual weight of the load and, therefore, did not immediately recognize that the hoist was overloaded.

TWO-BLOCK

Accidents: One two-block was reported. Damage to the upper hoist block consistent with that of a two-block was identified during a crane's condition inspection.

Lessons Learned: This was the first two-block accident reported for FY16. Fortunately, two-block accidents occur infrequently due to the controls implemented to prevent them. However, this type of accidents has the potential to result in significant injury and equipment damage. The accident was identified during a recent inspection but occurred at some point in the past. Operators must ensure that when operating near limits, they operate in a slow and controlled manner, paying strict attention to the location of their hoist. Also, when operating with upper limits defeated or bypassed, extreme caution must be utilized to ensure personnel remain attentive and that the limits are returned to normal operation once the limit is no longer required to be bypassed.

NEAR MISSES

Following a decline in near miss reporting toward the end of FY15 and the first quarter of FY16, near miss reporting in the second quarter increased by nearly 150 percent over the first quarter. Additionally, the majority of the increase came in the area of crane operations, as 83 percent of total near misses reported were crane near misses. It is encouraging that the majority of near misses were dynamic, suggesting that personnel are more involved in watching ongoing weight handling operations and directly contributing to accident prevention. The majority of near miss

reports were operationally related and included issues like crane miss-spools, identification of objects in the crane travel zone, and improper operation of the crane. Rigging related issues, such as improper rigging (gear selection and use, synthetic sling protection) and not knowing the weight of the load, accounted for 29 percent of near miss reports. The identification, documentation, and assessment of near miss events significantly improve safety and efficiency of weight handling operations. The goal of reducing accident severity continues to be the primary focus.

Weight handling program managers and safety officials should review the above lessons learned with personnel performing weight handling operations and share lessons learned at other activities with personnel at your activity. A review of second quarter data during indicates a need to focus on the fundamentals of rigging and improvement in the area of supervisory oversight. Weight handling managers and Commanding Officers are encouraged to ensure that their personnel are refocused in both of these areas and monitor their progress to ensure personnel are responding accordingly. Continued support and encouragement of the identification of deficiencies and near misses is critical in order to continue progressing toward the goal of zero significant accidents. Keep in mind that this goal is achievable and will result in a safer and more reliable weight handling program.

Navy Crane Center appreciates the strong efforts of the weight handling community to drive down the severity of weight handling accidents. Our metrics suggest that the community recognizes the value of identifying Navy accidents and near misses in order to identify the causes associated with these events. A comparison of significant accident totals for the first two quarters of FY15 and FY16 reflect a 32 percent decline. The challenge will be to continue to make progress toward the goal of zero significant accidents. A good next step might be to consider using the Human Factors Analysis and Classification System (HFACS). Some activities have begun to utilize HFACS in order to identify the causes associated with weight handling accidents. This approach focuses on understanding the "why" instead of "what" when considering the causes associated with an accident. HFACS benefits activities by providing a systematic approach toward accident investigation in order to ensure activities are implementing concise and effective corrective actions to prevent accident recurrence.

SHARE YOUR SUCCESS

We are always in need of articles from the field. Please share your weight handling/rigging stories with our editor nfsh_ncc_crane_corner@navy.mil.

WEIGHT HANDLING PROGRAM SAFETY VIDEOS

Accident Prevention provides seven crane accident prevention lessons learned videos to assist activities in raising the level of safety awareness among their personnel involved in weight handling operations. The target audiences for these videos are crane operations and rigging personnel and their supervisors. These videos provide a very useful mechanism for emphasizing the impact that the human element can have on safe weight handling operations.

Weight Handling Program for Commanding Officers provides an executive summary of the salient program requirements and critical command responsibilities associated with shore activity weight handling programs. The video covers NAVFAC P-307 requirements and activity responsibilities.

Mobile Crane Safety covers seven topics: laying a foundation for safety, teamwork, crane setup, understanding crane capacities, rigging considerations, safe operating procedures, and traveling and securing mobile cranes.

"Take Two" Briefing Video provides an overview on how to conduct effective pre-job briefings that ensure interactive involvement of the crane team in addressing responsibilities, procedures, precautions, and operational risk management associated with a planned crane operation.

Safe Rigging and Operation of Category 3 Cranes provides an overview of safe operating principles and rigging practices associated with Category 3 crane operations. New and experienced operators may view this video to augment their training, improve their techniques, and to refresh themselves on the practices and principles for safely lifting equipment and materials with Category 3 cranes. Topics include: accident statistics, definitions and reporting procedures, pre-use inspections, load weight, center of gravity, selection and inspection of rigging gear, sling angle stress, chafing, D/d ratio, capacities and configurations, elements of safe operations, hand signals, and operational risk management (ORM). This video is also available in a standalone, topic driven, DVD format upon request.

All of the videos can be viewed on the Navy Crane Center website: http://www.navfac.navy.mil/navfac_worldwide/specialty_centers/ncc/about_us/resources/safety_videos.html.

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