



THE CRANE CORNER

Navy Crane Center Technical Bulletin

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A WORD FROM TOPSIDE

Tim Blanton

As we enter into 2016, I wanted to quickly review another very positive year in Navy weight handling while also outlining our vision for the next several years. In looking at the past year from a numbers (metrics) perspective, a considerable amount of effort was expended to make 2015 one of the most successful years in weight handling Navy-wide.

- You accomplished over two million crane lifts with Navy cranes at over 420 shore activities without any OPNAV reportable class A or B accidents. More importantly, your efforts to improve accident recognition and reporting at the lowest levels, combined with the continued maturing of in-house surveillance programs, resulted in our best year ever for lowering the Navy's crane accident severity rate. In FY15, only 37 significant accidents were reported which accounts for less than 17 percent of total accidents, shattering the previous low mark of 23 percent.
- Safe weight handling operations begin with the acquisition of quality equipment. In FY15, Navy Crane Center (NCC) awarded contracts for 21 cranes valued at \$10.6M, while completing on-site testing and acceptance of 40 cranes valued at \$11.8M. Additionally, there were 76 cranes under manufacture, representing total award amounts of \$45.0M. In 2016 and into 2017, these numbers are projected to increase dramatically with the acquisition of shipyard portal cranes and cranes for other services/agencies such as the Army, Air Force, and Department of Energy.
- We measure your success by conducting on-site evaluations of your weight handling programs. In FY15, we accomplished 217 evaluations across three continents, with 211 programs being rated as satisfactory. Two were rated as unsatisfactory and only four were rated as marginally satisfactory, a significant improvement over past years.
- In support of your efforts, NCC also performed 37 third-party certifications of longshoring and floating cranes, validated 45 crane certifications for special purpose service, issued 9 crane safety advisories (CSAs), approved 369 crane alternation requests, and answered 41 requests for clarification, deviation, or revision (RCDR).

Although the numbers above reflect continued improvement in all areas, they do not guarantee future

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success and, in fact, can actually negatively contribute to future performance by influencing us to “rest on our laurels.” I often think back to a statement that one of my mentors instilled into me: “If you are not moving forward, you are moving backward.” Today, this statement is even more valid as tearing down forces (budget cuts, loss of experienced personnel, etc.) can erode program tenets affecting future performance. For this reason, as many of you are aware, we are preparing to issue a major revision to NAVFAC P-307, one of the foundational documents for Navy weight handling programs, which will now be known as “Weight Handling Program Management” versus “Management of Weight Handling Equipment.” This major revision will incorporate a new section covering program management, clarify existing requirements, ensure the manual is up to date with the latest OSHA requirements, and introduce new cost cutting measures by relaxing some requirements based on historical performance. The revision is in the final stages of editing and is projected to be issued later this fiscal year. We are planning to hold a series of meetings at various locations to provide a summary of changes and answer questions on the revision.

The latest revision to NAVFAC P-307 will require activities to establish basic metrics to be used to assist in evaluating and assessing their weight handling programs. The majority of activities already have some type of basic metric, such as total number of crane accidents, the numbers of lifts conducted, and the number of cranes in-service. While some of these baseline metrics are necessary for historical and trending purposes, I encourage you to establish forward thinking metrics to improve your program over the long term. For example, here at NCC, over the past few months, we have focused on maturing our metrics for crane procurement to better understand our costs and project durations. Only by better understanding any shortcomings can you effectively improve performance over the long term. If done correctly, metrics should focus your efforts toward improving performance in four primary areas: safety, quality, cost, and schedule.

In closing, thank you for making this past year a great one for Navy weight handling! ■

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 nonload bearing or nonload controlling parts. A complete list of CSAs and EDMs can be found on the Navy Crane Center’s web site.

CSA 223 – JOHNSON SMLB THRUSTER BRAKE DISCREPANCY IN TORQUE ADJUSTMENT INSTRUCTIONS

Background:

A. The purpose of this CSA is to inform activities of an erroneous torque setting reading instruction in the Johnson SMLB thruster drum brake user’s manual.

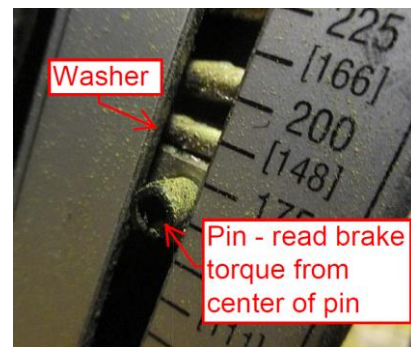
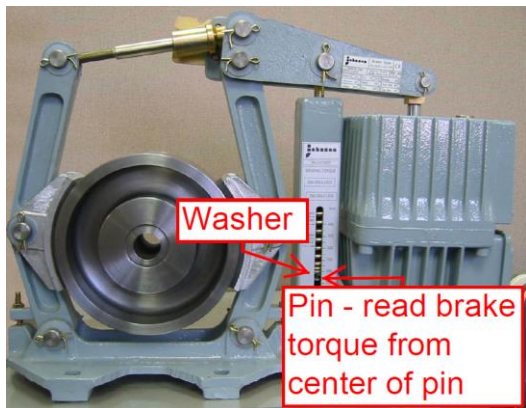
B. The brake manufacturer, Johnson Industries Ltd., has confirmed that the user’s manual incorrectly states: “The torque setting is read off of the index on the spring tube. Read the value

corresponding to the bottom of the flat washer that sits under the main spring.” Johnson has confirmed that the torque setting is properly read from the center of the pin on the spring tube and not the bottom of the washer. This error affects all SMLB model brakes and brake user’s manuals.

Direction:

A. Before or during the next annual or “B” maintenance inspection period, activities with Johnson SMLB thruster drum brakes shall ensure that torque settings are set appropriately, using the updated original equipment manufacturer (OEM) direction, to ensure proper brake torque. Activities shall also annotate their user’s manuals and update their specification data sheets to reflect the correct direction to read the torque setting from the center of the pin on the spring tube.

B. Activities are reminded that adjustments to return hoist brakes to established range/tolerances do not require a load test if the conditions of NAVFAC P-307, paragraph 3.4.2.2.2, are met.



CSA 224 – CRACK ON TRAVEL TRUCK FLOAT PIN OF SAMSUNG PORTAL CRANE

Background:

A. An activity reported a crack on the underside of one of sixteen travel truck float pins on a Samsung 60-ton portal crane. The crack is located along the underside length of the pin and extends approximately 1.5 inches along the face of the pin. All other travel truck float pins on the crane were checked and found to be satisfactory.

B. Based upon the characteristics of the crack, the crack is most likely due to material or heat treatment defects. However, lab analysis still must be performed and Navy Crane Center will update this CSA, if necessary, after receiving the results of the lab analysis.

Direction:

A. Before or during the next "B" preventative maintenance period, activities with Samsung portal cranes (Class S1 and S2) shall inspect travel truck float pins for cracks and report findings to Navy Crane Center. These inspections shall include visual inspections to the greatest extent

possible without disassembly. Boots and inspection covers shall be removed or shifted for the visual inspection. If cracks are found, the pin shall be replaced.

B. For clarification, the float pins shall continue to be inspected in accordance with the Appendix C, MISR item 40 of NAVFAC P-307. This inspection shall include a visible inspection to the greatest extent possible without disassembly (boots and inspection covers shall be shifted or removed).



EDM 107 – LOOSE FASTENING RIVET ON STEARNS DC BRAKE MECHANICAL SWITCH

A. The purpose of this EDM is to inform activities of the possibility of a poorly crimped rivet on the actuating arm on the mechanical switch of certain Stearns DC brakes. An activity reported that a poorly crimped rivet had begun to work loose on the switch housing on a Stearns 87,000 series DC brake. If the rivet was to come all the way out, the actuating arm could potentially become ineffective in switching between the “pull-in” and “hold-in” currents for the brake coil. Over time, this deficiency could cause the brake coil to burn open and render the brake inoperative (unable to open). Additionally, the activity identified new switches that also appear to be poorly crimped. The OEM allowed the activity to re-peen the rivets locally in order to obtain a more stable pivot point.

B. The mechanical switch in question can be identified by the AB logo and the raised lettering “SIZE 2-3, 600 V.A.C.” at the electrical connections. These mechanical switches can be found on Stearns DC voltage brakes, series 5X, XXX and 8X, XXX.

C. Activities are reminded that NAVFAC P-307 Appendices C and D require inspections for loose and worn components when inspecting brakes. Navy Crane Center recommends activities

with Stearns DC brakes, having the mechanical switch referenced above, pay particular attention to the crimping of the rivet for looseness at the next maintenance inspection.

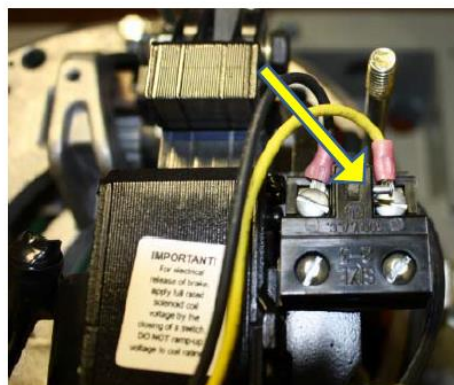


Figure 1

Stearns DC Brake Switch
Loose Rivet

See Navy Crane Center
EDM 107

Figure 2

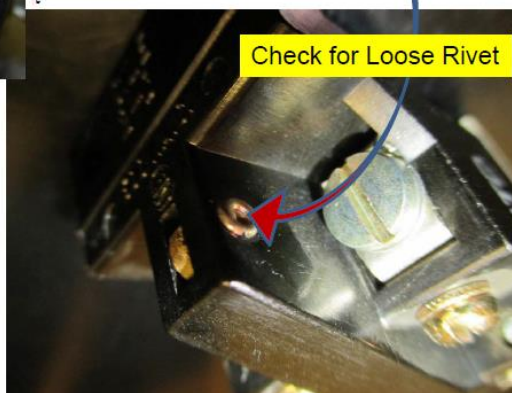
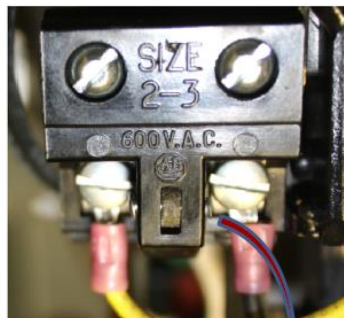


Figure 3

EDM 108 – CRACKED SWAGED SLEEVE FITTINGS ON RIGGING GEAR


A. The purpose of this EDM is to inform activities that Senyo KK, a Japan based manufacturer, has discontinued use of their wire rope sling swaged sleeve fittings due to cracks found on the fittings after sling fabrication. The original equipment manufacturer (OEM) has been unable to determine the cause of the cracking.

B. The affected fittings are steel, possibly stainless steel, in various millimeter sizes, and have no distinguishing markings. Distribution of these fittings is limited by the OEM to Japan.

C. Navy Crane Center has no reason to believe that these fittings have been distributed outside of Japan. However, Navy Crane Center reminds activities that NAVFAC P-307, paragraph 14.4.2, requires a pre-use inspection of rigging gear, including wire rope slings, by the user prior to each use. As required by NAVFAC P-307, paragraph 14.7.2.2.d, this pre-use inspection includes inspecting the condition of the wire rope end fittings for cracks or deformation. ■

WEIGHT HANDLING SAFETY BRIEFS

Navy Shore Weight Handling Safety Briefs (WHSB) are 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 our 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!

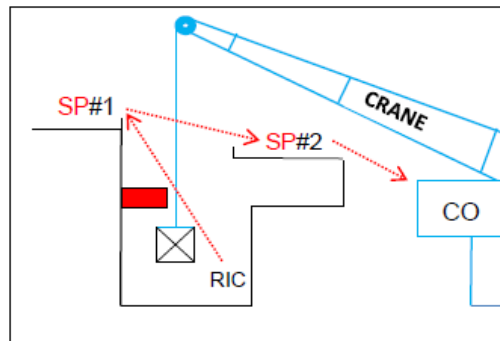
When WHSBs are issued, they are also posted on the NCC's web site at: <http://www.navfac.navy.mil/ncc>. 

Weight Handling Safety

Brief!

Title: OPERATION COMMUNICATIONS

Target Audience: CRANE OPERATORS / RIGGERS & SUPERVISORS

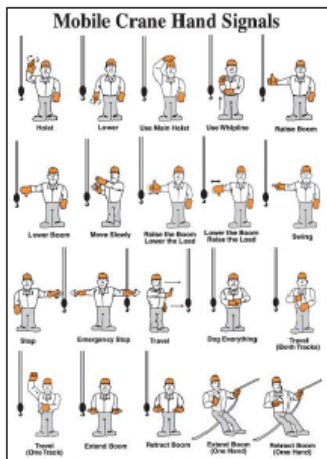


Inadequate communication between crane operators and signal persons (SP) has resulted in serious accidents. Clear and concise communication between the operator and the SP is essential to ensuring the lift is conducted safely. Crane communications are discussed in detail in NAVFAC P-307, section 10.6.

HAND SIGNALS: The primary means of communication for crane team operations during lifts where the SP is in plain sight of the operator. A positive means of transferring control of the load shall be used. Relayed hand signals can cause delayed communication and response times. Caution is advised. See illustration on the left. Additionally, be wary of additional factors that can affect the effective use of hand signals, to include lack of adequate lighting, poor weather (e.g., fog or other weather resulting in reduced visibility), sun "blinding", and dirty gloves (making it more difficult for the operator to see, particularly at a distance).

DIRECT VOICE: Typically used in areas (indoors) where the environment has minimal background noise. May be used during "blind lifts" when briefed by the crane team supervisor or rigger-in-charge (RIC).

RADIO: Radio communications are typically utilized when lifts are out of the sight of the crane operator (e.g., inside enclosures, ship board accesses) or the lift is complex and involves potential binding. **Perform a radio check** in the area of the lift to **ensure** that the **signal transmission is effective, clear, and reliable**. **Verify batteries are charged**. The **operator's reception of signals shall be by a hands-free system**. The **SP shall remain in continuous voice communication with the crane operator**. The operator shall stop movement of the crane any time that radio communication ceases and shall not proceed until communication is reestablished. Voice directions shall be given from the operator's directional perspective. Each voice signal shall contain the following elements, given in the following order: Crane identifier, function (boom, hoist), direction; distance and/or speed; function, stop command. Additionally, the SP should get a horn blast or verbal check back from the operator that he/she understands the signal.



Title: CHAIN FALL OPERATING PRECAUTIONS

Target Audience: GEAR INSPECTORS, RIGGERS, AND CRANE TEAMS

When a chain fall is rotated on the top hook 180 degrees, the load chain will exit the top of the hoist "onto" the load chain supporting the load as seen in Figure 1.



Figure 1

Incorrect Tail Chain Flow

Load chain will bind with pivoting anchor when chain fall is lowered.



Figure 2

Displaced Pivoting Anchor

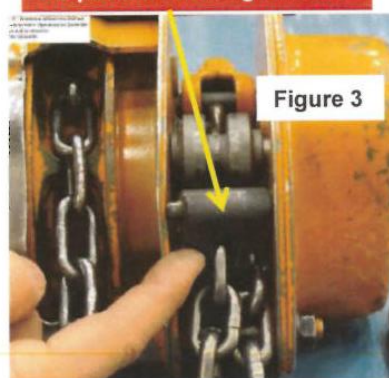


Figure 3

Load chains should exit the bottom away from the chain fall.

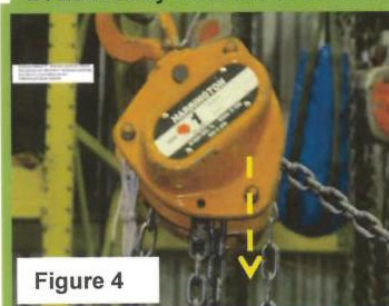


Figure 4

Correct Tail Chain Flow

SAFETY

- This WHSB is to notify activities who have chain falls in their inventory of a recent problem an activity encountered while drifting a load with chain falls.

- **Type of Equipment:** 1 Ton Harrington Chain Hoist, Model M3, Product Code CB010

- **Reference:** Harrington Hoists Original Equipment Manual, Chain Hoist CB Series

- **Event:** During drifting operations the unloaded portion of the chain fall load chain caught and pulled the pivoting anchor into the chain fall body, twisting the anchor and bending the side plate allowing the load chain pivoting anchor to fall from chain fall. (See figures 1, 2, and 3) The proper orientation is shown in figure 4.

- **Contributing Factors:**

- a. Chain fall was operated at an angle or horizontally while turned 180 degrees, without monitoring the flow of load chain.
- b. Chain fall load chain bag (not shown) was tied to the load chain anchor, the weight of the load chain contributed to turning the chain fall while in operation.
- c. Personnel were not familiar with chain fall operating limitations.


- **Related Chain Fall Equipment History:**

- a. WHSB 10-S-03 - Chain Fall Guide Roller Precautions
- b. Crane Safety Advisory (CSA) 193 - Inspection of chain fall pivoting anchor is the same as guide roller inspection to include bent side plates, missing bolts, and correct chain flow through the hoist.

WEIGHT HANDLING TRAINING BRIEF

Navy Shore Weight Handling Training Brief (WHTB) is provided for communication to Navy shore weight handling program personnel who are involved in Navy shore weight handling operations. This brief discusses the requirements for near miss reporting, provides examples, and discusses the importance of reporting to overall program safety.

Similar to the Navy Shore Weight Handling Safety Brief, the WHTB is intended to be a concise and informative discussion of a trend, concern, or requirement, related to recent/real-time issues that have the potential to affect our performance and efficiency. The WHTB is not command specific and can be used by your activity to increase awareness of potential issues or weaknesses that could result in problems for your weight-handling program. 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>. 

Weight Handling Training Brief!

Title: Near Miss Reporting

Target Audience: All Personnel Associated with the Weight Handling Program

*In this picture, a bridge crane was found **improperly spooled** during the pre-use inspection. The crane operator stopped the inspection and notified his supervisor. Continued operation of the crane may have resulted in damage to the wire rope and/or the crane. Identification of this condition prevented a crane accident and possibly a dropped load.*



Improperly spooled
hoist drum / miss-spool

- Near misses are lessons to be learned that do not fall under the Navy crane and rigging accident definitions and are **required to be reported** per NAVFAC P-307, paragraph 12.5 using Figure 12-2. **Near misses are unplanned events that do not result in injury, damage, or avoidable contact, but easily had the potential to do so.** A near miss is an accident that almost took place and near miss reports are an essential element of the Accident Prevention Triangle and key to preventing more serious accidents.

- It is important that all personnel understand that **near misses can occur fairly frequently during weight handling operations** and that scenarios relating to near misses vary widely. Training and awareness of near miss identification and reporting should be an integral component of every activity's weight handling program and **all individuals** should be encouraged to identify these learning opportunities. Additionally, strong internal surveillance (monitoring) programs are a great tool that can also be used to identify potential near misses. Recent near miss examples include:

- (1) Identification of an **improperly spooled crane hoist drum** prior to operation (similar to the crane in the photo). Failure to identify crane miss-spools can often result in wire rope damage (a reportable accident).

- (2) Loss of control of a load requiring a crane team member or observer to call "All Stop" in order **to prevent the load from colliding** with a nearby object.

- (3) Prior to commencing the lift of a pump from its foundation, a crane team member inspected the load and identified a **fastener that was left installed**.

- In each of these examples, accidents were prevented by trained personnel who recognized a hazard and stopped in order to prevent an accident. This **positive behavior** is a **vital component for improving** and maintaining weight handling safety, and all Navy activities are encouraged to rededicate their efforts in the area of near miss identification and reporting.

Training

7 January 2016

Navy Crane Center 16-T-01

CRANE ACCIDENT PREVENTION, SAFETY CHALLENGE FOR FY16

In FY15, the total number of crane accidents reported was slightly less than the prior year. Activities continued to identify an increasing number of crane accident near misses in FY15, and your efforts are paying off. Significant crane accidents (overloads, dropped loads, two-blocks, injuries, derailments, and contact with overhead power lines) declined by 30 percent. Of special note, the reported number of injuries was reduced in FY15 by 60 percent compared to FY14. This progress is encouraging and noteworthy as the goal is to reduce the overall number of significant and OPNAV reportable accidents to zero.

The Navy's broad definition for crane accidents, i.e., virtually any unplanned event regardless of degree of injury or whether damage occurred, along with our philosophy of reporting, analyzing, and learning from small events has proven effective in keeping the number of truly serious accidents at a very low level. It is evident that progress is being made in raising the sensitivity on the part of activity personnel to report lower level events (near misses and other unplanned events) in addition to those events that meet the Navy's comprehensive accident definition based on the increase in crane accidents and near miss reports. This healthy strategy will continue to improve the safety of weight handling operations over the long term. My challenge for each activity in the upcoming year is to continue with a sharp focus on monitoring weight handling operations in order to identify, document, and obtain lessons learned from events at the lowest levels thereby reducing significant accidents.

Even with the FY15 improvements in crane safety, it is important to remember that weight handling is a dynamic and dangerous operation if not performed correctly. Personnel should remember not to let their guard down as a result of these recent improvements. Although there was a significant reduction, activities still reported 37 crane accidents meeting the level of what Navy Crane Center defines as significant. Additionally, significant rigging accidents increased by 30 percent and rigging accident injuries also increased substantially. Remember that the goal should be to instinctively focus on the value of gaining lessons learned from reporting all events in the weight handling operation.

Historically, the winter months have posed unique challenges in preventing crane accidents. Cold weather increases the potential for ice and snow in many areas and creates hazardous weather environments that cannot be ignored. Freezing equipment and frozen ground conditions can compound an already challenging environment. Ice and snow on cranes, barge decks, ground level rails, and rail switches create hazards that, if gone unrecognized, could lead to accidents. Pay special attention to crane sheaves and hoist blocks that may become frozen, causing improper spooling of wire rope. Operations in cold weather also reduce personnel dexterity and induce additional physical challenges which can lead to accidents. Exterior work surfaces, platforms, walkways, and ladders are especially prone to icing, and additional precautions must be taken to ensure personnel do not encounter slip and fall hazards. Appropriately address the challenges these circumstances may create as you assemble your weight handling maintenance and operations teams during the next few months. Adverse weather is not the only threat to safe crane operations during the next few months. With the shorter winter days, the hazards of working in the dark increase.

Maintaining a sharp focus on the critical job at hand during weight handling operations is imperative. It is critical that we convey to all personnel the need to maintain their focus on the job from the time the lift begins until the lift is completed, the gear is removed, and the crane is stowed or parked. Ensure that jobs are adequately staffed to guard against the possibility of "cutting corners" in an attempt to get the job done.

Managers and supervisors should conduct increased observations of weight handling operations. Look for signs of complacency or inattention and remind personnel that if problems are encountered to stop and inform supervision. Ensure that crane teams have sufficiently planned the task at hand and all involved personnel understand their responsibilities. Proactive leadership throughout the command is a powerful tool for ensuring safe weight handling operations. Effective planning, teamwork, communication, situational awareness, and operational risk management (ORM) are all good tools for reducing the risk of an accident.

A safe and reliable Navy weight handling program is an essential enabler of fleet readiness. I encourage commanding officers to intensify your efforts to raise the level of weight handling program safety awareness during weight handling operations and continue to evolve a culture wherein people instinctively focus on the value of gaining lessons learned from reporting ALL unusual events. Our efforts should be focused on striving toward the goal of zero significant accidents. ■

TIP OF THE SPEAR (Notable Evaluation Items)

Program Management

Crane Accident Severity – As stated at many evaluations, the severity of crane accidents, not the total quantity, is our primary focus area. Although some significant accidents may at first appear to be less severe, the underlying causes of significant accidents, if allowed to remain uncorrected, may eventually lead to more severe outcomes. Non-significant accidents, including those that deal with minor avoidable contact that result in no material or equipment damage, are most valuable when used as lessons learned opportunities as a tool to prevent more severe accidents from occurring. In addition to lessons learned from accident events, it is important for programs to perform ongoing self-critical surveillance of operations as the first defense against crane accidents. The use of documented oversight (surveillance) allows for the identification of trends so that corrective actions can be taken and weaknesses corrected before more serious accidents occur.

Internal Audits - Some weight handling programs have improved in the performance of internal audits, particularly in issuing and adhering to proactive schedules of specific areas to be reviewed, in addition to identifying potential process improvements and best practices. For activities that are taking the steps to improve, further gains may be realized by shifting from horizontally focused audits of individual tasks to more vertical process audits. In this way, activities can identify systemic problems affecting overall performance within the process. Additionally, while activities have improved in developing audit schedules, some key weight handling program areas are not being reviewed at a sufficient frequency to provide leading

indicators of poor performance. Overall, activities should strive to maintain audit plans and schedules balanced to review the areas of known weakness or highest risk.

Operations

Recently, during performance of simulated lifts as part of several evaluations, many category 3 crane operators did not perform adequate post-use rigging gear inspections. More importantly, damaged rigging gear is being identified by the evaluation teams that activity operators did not recognize as an indication of a potential crane or rigging accident. As a result, they did not make notification of the potential accident to their supervisor or recognize the need to stop work and investigate the event. In several instances, activity supervisors could not state what actions to take for reported damaged rigging gear.

At one activity, a piece of manufacturing equipment weighing over 3,000 pounds was sitting on three wooden dollies and improperly rigged to a 1,000-pound capacity crane. In this case, the crane was being improperly used (pre-load applied to the rigging gear) in the event that the load inadvertently shifted. The actual weight of the equipment was not known by the operator, and the load on the crane could not be determined (no load indicating device was in-line with the rigging). Additionally, the rigging gear was not in an approved test and inspection program, the shackle being used was side-loaded, the angle on the rigging gear was less than 30 degrees, and there was no chafing gear in place to protect the straps around sharp corners.

Maintenance, Inspection, Test, and Certification

The evaluation team identified several instances of trade debris, wear products, and test equipment adrift in an electrical cabinet, some of which had existed during previous inspections and had been accepted by activity inspectors as normal. Examples included:

- a. Metal flakes from minor wire rope sheave wear were identified on the main hoist hook block. Wear products should be cleaned up during annual maintenance to evaluate if there is a more significant problem.
- b. Two of ten fasteners for a bridge drive gear box had been replaced in the past. The eight bolts which were apparently not replaced were grade 5 bolts, but the bolts that were replaced over a decade ago were grade 8 bolts. This change had not been identified by inspection personnel for technical evaluation and acceptance.
- c. An interface module (test equipment) was found adrift in an electrical cabinet. In another instance during an evaluation, activity inspectors identified and removed trade debris from an electrical cabinet that had existed during the annual inspection and was not identified as a deficiency at that time.
- d. During inspection of a crane, the evaluation team identified that festoon cables were rubbing against metal support brackets, resulting in chafing damage to the festoon cable insulation.

Contractor Cranes

Oversight of contractor cranes continues to be an area of weakness at many activities. The Certificate of Compliance form (NAVFAC P-307, Figure P-1) is the minimum required check of contractor crane and rigging gear on Navy activities; however, evaluation teams continue to identify that numerous activities do not recognize deficiencies with the use of this form. In many cases, applicable OSHA and ASME standards are not being listed, and required information is omitted (e.g., prime contractor, contract number, phone number).

Engineering

One activity was unable to accurately assess current and projected engineering workload or determine the impact of the limited engineering support to the local area of responsibility (AOR) or its tenant commands. Current workload estimates did not consider the entire AOR. While this activity sets engineering priorities at a weekly meeting, these priorities are reactively versus proactively focused and based largely on immediate customer command needs. Additionally, there was an absence of metrics and no system for tracking open engineering tasks or task completion. The evaluation team recommended the activity develop metrics to monitor engineering workload and the overall impact to the activity's supported commands.

Training

One activity took several actions to address a contributing cause to the rise in significant crane accidents – a lack of adequate training and weak development of riggers and supervision. Although many individual action items were specified, improvement was needed in the refresher training program, specifically aimed at challenging the workforce, which is a key component of day-to-day performance. Additionally, the training was entirely classroom-based (past events, corrective actions, recent trends, and basic rigging power point training), and did not include any hands-on practical training, which could provide greater benefit to the workforce.

Rigging Gear

As discussed in the Operations paragraph, damaged rigging equipment available for use in gear rooms and rigging gear storage areas was identified at many activities. Additionally, many activities continue to have easily-avoidable deficiencies in proof load test, re-inspection documentation, and equipment markings. ■

ACCIDENT ANALYSIS

Why is it important to understand the causes of accidents and how can activities accomplish the task of identifying those causes? The Navy requires all activities to conduct an accident investigation at a level or depth that is appropriate for the severity of the accident. Identification of the cause(s) of an accident is essential to identifying and implementing corrective actions that help prevent recurrence. In 2014, the Navy Crane Center (NCC) began informing Navy activities of a tool that can be utilized to aid and improve the process of causal analysis. A series of weight handling training briefs (WHTBs) were published providing details relating to the Human Factors Analysis & Classification System (HFACS). HFACS is a system designed to provide a better understanding of the causes associated with a specific event or series of events. It encourages activities to broaden their focus as it relates to organization, supervision, and pre-existing conditions instead of focusing on the individual. NCC encourages activities to review the training briefs and incorporate this valuable tool into their accident investigation process. The WHTBs are available on the NCC website (accessed by clicking on the weight handling accident prevention info tab). The website is http://www.navfac.navy.mil/navfac_worldwide/specialty_centers/ncc.html.

Why is this tool important? Throughout the year, NCC receives accident reports that do not always clearly identify the cause of the event or the reports incorrectly identify the cause. Although personnel are well intentioned, activities occasionally miss the mark with respect to identifying the cause. One example in particular involved an accident that resulted in a dropped load when a swaged fitting on a wire rope sling failed during the lift. The activity identified equipment failure as the cause of the accident and developed corrective actions based on an incorrectly identified cause. It is important to recognize that corrective actions taken based on an incorrectly identified cause(s) are not effective in preventing recurrence.

Unfortunately, it is not uncommon for activities to erroneously identify equipment failure as the cause of an accident. Activities should recognize that true equipment failures are infrequent. Damaged gear, however, can result from various other causes, including improper use, inadequate process, or procedure compliance issues. Like many accidents, the accident described above had more than one cause that led up to the event. The swaged fitting was manufactured by personnel who were not sufficiently trained in the swaging process. Additionally, the procedure utilized to certify the equipment identified the wrong capacity for test load. As a result, when the sling was used near its rated capacity, the swage broke and the load dropped. Each area of the HFACS process must be carefully examined in order to drill down to the root cause. Utilizing HFACS provides a systematic tool that allows activities to conduct step-by-step analyses to determine the cause(s) related to an event. Various activities have begun incorporating HFACS into their accident investigation process with positive results. In September of 2015, NCC sponsored a three-day HFACS workshop to share this innovative tool for use during the accident investigation process. A second workshop is being planned for the first half of 2016. Additional details will be provided at a later time.

FY13-15 ACCIDENT SUMMARY

Category	2013	2014	2015
Crane Accidents	195	225	219
Significant Crane Accidents	49	52	37 ¹
Rigging Accidents	65	66	63
Significant Rigging Accidents	25	22	29
Crane Near Misses	140	182	186
Rigging Near Misses	50	53	83
Contractor Crane Accidents	33	30	35

Note 1: FY15's 17 percent crane accident severity rate was the lowest since significant accidents have been tracked. ■

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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