THE CRANE CORNER

Navy Crane Center Technical Bulletin

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A WORD FROM TOPSIDE

Tim Blanton

As 2014 comes to a close, I want to reflect on another very positive year in Navy shore activity weight handling and provide our vision for 2015 and beyond. In FY14, while performing over two million crane lifts and millions of rigging operations at over 400 Navy shore activities, you continued to make great strides in the area of safety. Over the past few years, we have focused heavily on increasing the level of knowledge with regard to accident and near miss recognition and reporting in an effort to capture more data, which we knew was occurring but not being reported. As a result, the number of "reported" crane accidents has been increasing (220 in FY14), a 10 percent increase in each of the last two years. With regard to near misses, 226 near miss reports were submitted (more than a 20 percent increase over FY13).

Most importantly, our goal is to identify issues while they remain minor in nature, lowering the rate of significant accidents, thereby lowering the Navy's (or an activity's) accident severity potential. Accidents that we considered significant include dropped loads, overloads, two-blockings, personal injuries, crane derailments, and contact with power lines. These types of accidents have a greater potential for serious consequences. We identify accident severity potential as the number of significant accidents divided by the total number of accidents reported. Even with the increase in reported accidents, the number of significant accidents stayed relatively the same, thus lowering the accident severity potential to 23 percent (a steady decline since FY11). As I write this article, we are already off to a strong start in FY15, as the accident severity potential since 1 October is only at 16 percent (5 of 32). I attribute this improvement to activities that have embraced a self-critical culture and who have established robust oversight programs (also known as surveillance/observation/monitor programs), which are driving down the crane accident severity potential. By populating the base (minor events) of the Navy Crane Center crane accident safety triangle (see Weight Handling Training Brief 14-T-02), these activities have been able to identify trends using their surveillance, near miss, and accident data to implement effective long-term corrective actions, which are making a difference.

In 2015, in keeping with our vision to further lower the crane accident severity potential, we are pushing forward with two new initiatives. First, many of you have seen the recent weight handling training brief series that we began issuing in September, which explain the "Human Factors Analysis and Classification System" better known as HFACS. This is the next logical step in our continuing effort to promote a self-critical approach at all levels of the weigh handling program to reduce accident severity.

Inside This Issue

The HFACS process can be used to conduct a more thorough analysis on a single event but it can also reveal adverse trends in accidents, surveillance data, and other weight handling program issues. The primary advantage of HFACS is that it requires activity personnel (including management) to look at a problem from four different perspectives the unsafe act itself, preconditions that led to the unsafe act, the supervisor(s) role in the event or trend of events, and the organizational climate (management driven) that influenced the unsafe act. In many cases, accident reports only address the unsafe act itself and place primary blame on the individual(s) who committed the error. The HFACS process enables activities to see past the personal behavior issue and assists in the identification of the true reasons why personnel make the decisions that lead to unsafe events. Keep an eye out for continuing training briefs that further discuss the HFACS process.

Second, over the past year, the Navy Crane Center has been experimenting with pilot programs to better understand an activity's accident severity potential. As everyone associated with the weight handling program knows, the Navy's crane accident definition is very broad. This is intentional to ensure we are paying attention to the less severe events such that the more severe events have less potential to occur. We accomplish this by capturing data from all types of accidents, from minor contact with no resulting damage up to accidents involving fatalities (fortunately none in over 20 years). To truly understand the accident severity potential at a particular activity or for the Navy for that matter, we need to apply some advanced metrics (levelization) to provide a better picture. For example, crane collisions account for 50 percent of the crane accidents reported Navy-wide. However, most collisions result in no or only minimal damage (paint scrapes) while some result in tens of thousands of dollars in damage/repair cost. Over the past year, we have taken the accident definition and broken it down into ten different levels of severity, which range from near misses and avoidable contact with no resulting damage up to the worst case events. We then assigned a weighted score to each level, which, when applied to an activity's accidents, presents a picture of the true accident severity potential at that activity. The information can be applied at the activity level up through the chain of command. This pilot program has been applied to several large activities on a trial basis and the results are encouraging, as they present an unbiased picture as to the true state of the activity's accident severity potential. The resulting information says a lot about the activity's true understanding of the Navy's weight handling investigation and reporting requirements, as well as the ability to embrace a self-critical culture, which I believe to be of critical importance to our ability to learn from our errors. In 2015, we will continue to mature this process with the goal of implementing it Navy-wide in the near future. Thanks 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 non-load bearing or non-load controlling parts.

A complete list of CSAs and EDMs can be found on Navy Crane Center's web site: http://www.navfac.navy.mil/navfac_worldwide/specialty_centers/ncc/about_us/resources/safety_msg.html.

CSA 216 – CRACKED BRAKE ADJUSTMENT NUT ON A DEMAG TYPE KBA 100B4 BRAKE MOTOR

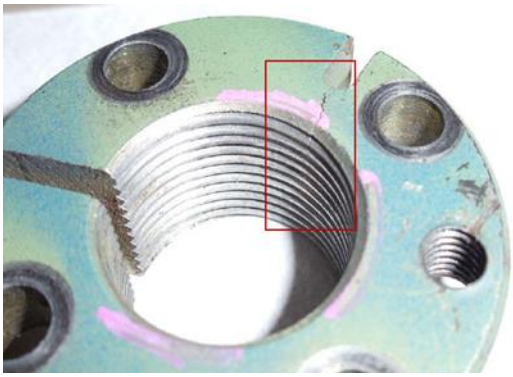
Background:

A. The purpose of this CSA is to inform activities of a potential deficiency with the brake adjustment nut in the Demag Brake Motor, Type KBA 100B4. During annual brake inspections, an activity was unable to maintain the specified adjustment for the hoist brake in a 21 year old creep drive motor. After disassembly of the motor's brake, visual inspection of the adjustment nut revealed a crack through the thread body. The adjustment nut is identified as item 8 in Mannesmann Demag Clutch and Brake Adjustments Motors and Microspeeds Manual.

B. The OEM confirmed that the adjusting nut is unique to the Demag type "KBA" conical rotor brake motors; the OEM is not aware of other cracked brake adjustment nuts. The KBA 100B4 brake motor continues to be used by Demag in new equipment designs.

Direction:

Activities with Demag Type KBA conical rotor brake motors shall compare the latest hoistbrake air gap (axial displacement measurement) with previously recorded measurements on file to evaluate if there is a pattern of inconsistent measurements. If a pattern of inconsistent measurements is determined, the motor shall be disassembled prior to or during the next annual maintenance period in order to inspect the brake adjustment nut for cracks.



CSA 217 – BROKEN ROLL PIN IN WRIGHT-WAY TRACTOR DRIVES

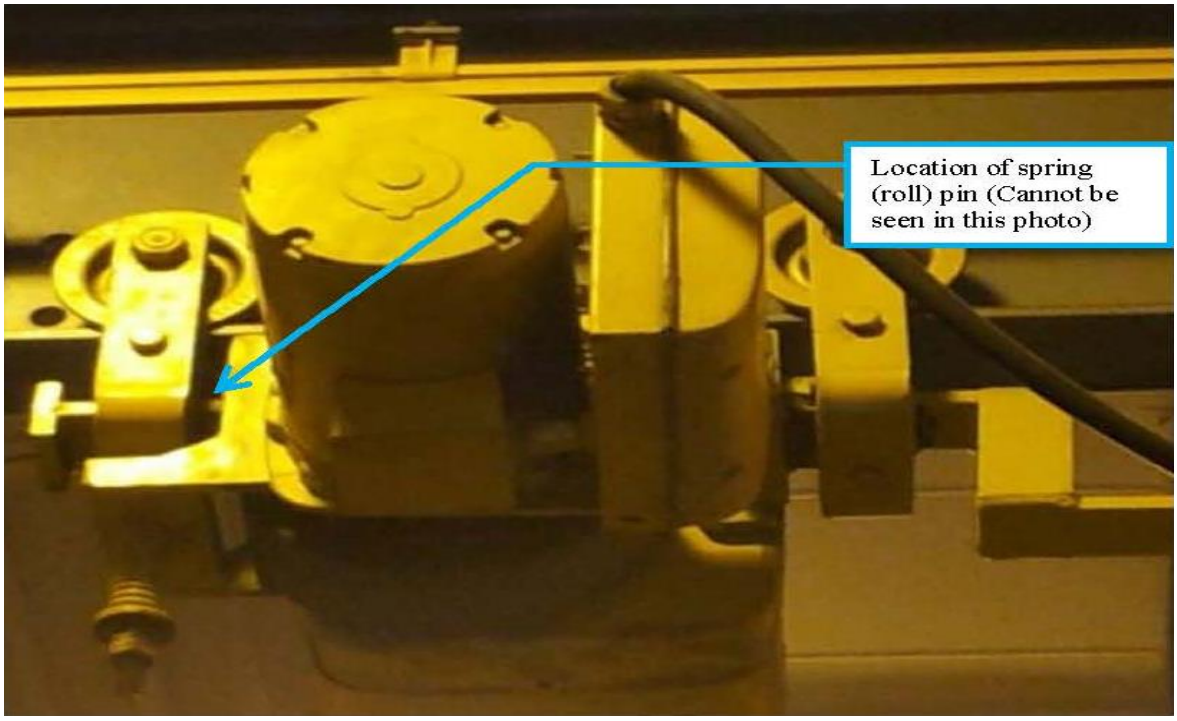
Background:

A. The purpose of this CSA is to inform activities of a potential deficiency with the roll pin used in the suspension assembly on Wright-Way tractor drives for use on patented track. During an activity's crane maintenance inspection, two monorail tractor drive units on two different cranes had broken roll pins, which were discovered after their removal even though they appeared to be intact. The activity reported that one of the failed roll pins led to parts falling from the crane. The subject roll pin (item 9, part number PA 5391) secures the tension adjustment rod in the tractor drive assembly.

B. The manufacturer is not aware of broken roll pins in other Wright-Way tractor drives and confirmed Revision B is the current drawing. This pin is used on tractor drives mounted on 2 inch, 3.25 inch, and 3.33 inch patented track flange widths for hoists with a maximum capacity of 5 tons. Wright-Way product numbers for applicable tractor drives are 2300080, 2300110, 2300090, 2300120, 2300220, 2300230, 2300240, 2300250, 2300260, 2300270, 2300280, 2300290, and 2300300.

Direction:

A. Activities with cranes that utilize the Wright-Way tractor drives specified above shall remove the roll pin (part number PA 5391) during the next annual maintenance inspection and replace it with a new pin. Activities finding broken or excessively worn pins shall report results back to the Navy Crane Center.



WEIGHT HANDLING TRAINING BRIEFS

The following Weight Handling Training Briefs (WHTBs) are provided for communication to Navy shore weight handling program managers. These briefs are a part of a series of briefs that discuss the weight handling "Safety Triangle." The Safety Triangle is used to demonstrate the progression of a healthy weight handling accident prevention program. The first brief focuses on the base (or foundation) of the triangle where weight handling program deficiencies, trends, and minor events are identified and corrected before they result in a more serious event. Just as the pyramids of Egypt have lasted thousands of years with a solid foundation, a long-lasting, stable weight handling accident prevention program needs a solid foundation. This foundation is built (and broadened) by proactively and routinely, capturing and reacting to deficiencies at the lowest level via workplace observations/surveillance and through near miss reporting. The bottom of the triangle is the area where activities find and correct minor deficiencies and events before the deficiencies or events increase in greater severity. The next three briefs describe how this foundation is developed through an effective surveillance program, which includes determining the root causes of deficiencies that are identified by surveillance. The final brief addresses the Switch Theory, which explains the value of intervention and correction of identified unsafe acts or process omissions.

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 as a reminder to those performing weight handling tasks, or used as supplemental information during supervisory routine discussions with employees.

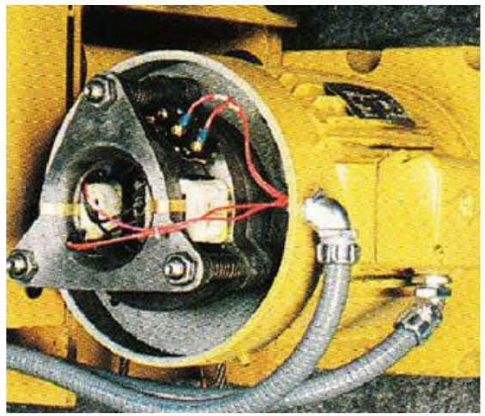
When Navy Shore Weight Handling Safety or Training Briefs are issued, they are also posted in the Accident Prevention Info tab on Navy Crane Center's web site at: http://www.navfac.navy.mil/navfac_worldwide/specialty_centers/ncc/about_us/resources/accident_prevention.html. 

Navy Shore Weight Handling Training Brief!

Title: Utilizing OEM Instructions in Servicing Specifications

Target Audience: Weight Handling Engineers, Inspectors ,and Maintenance Personnel

Charge Indicator LED



Wright work-rated brake

Incomplete servicing specifications due to failure to incorporate original equipment manufacturer (OEM) manuals and instructions can lead to hazardous conditions. Activities are reminded to review all OEM literature to ensure their maintenance procedures incorporate all OEM instructions and safety precautions, and include all the features for their specific equipment. Recent examples of incomplete servicing specifications reported to the Navy Crane Center include:

- Magnetek microprocessor drives are equipped with a charge indicator light to notify servicing personnel of the condition of the drive's DC bus voltage (see picture on left). Work was performed within a control panel where the DC bus voltage was not at a safe level contrary to the OEMs safety guidelines for servicing their equipment. This incident could have resulted in personnel being shocked.

- Wright Work-Rated hoists are equipped with an interlocking switch designed to prevent the hoist motor from starting before the brake is released. This switch was found out of adjustment after it was reported the load would drop approximately ½" when pressing the up button. Personnel at the activity were unaware this feature existed. This incident could have resulted in unplanned contact.

As stated in NAVFAC P-307, paragraph 2.5.2, servicing specifications shall be developed using OEM manuals and instructions for all mechanical and electrical equipment.

By ensuring servicing and maintenance procedures include all pertinent OEM information, potential hazards can be avoided.

2 October 2014

Training

Navy Crane Center 14-T-03

Navy Shore Weight Handling Training Brief!

Title: Supervision's Human Factor Role

Target Audience: Navy Shore Weight Handling Program Managers

In Causal Analysis the third human factor involved is that of supervision. Not every lift made or crane operation has a direct supervisor on the scene. Yet the supervisor still has a role in the accident/deficiency. Some examples of supervisor roles are the following:

Inadequate Supervision
- Oversight/Leadership accepts unsafe or sub par standards
- Supervision fails to lead by example (mentoring)
- Does not provide feedback/lessons learned to work force

Planned Inappropriate Operations
- Personnel assigned not qualified for tasking
- No risk assessment for the job
- Personnel assigned qualified yet not proficient or limited experience
- Accepts unsafe risks without need

Failure to Correct Known Problem
- Living with personnel or equipment deficiencies

Supervisory Violations
- Directs or allows violations to occur

Even though a precondition enabled the decision, which led to the unsafe act, causing the event, the supervisor failed to identify their role in hindering the precondition. Always ask "What was the supervisor's role in enabling the decision that led to the event?"

9 October 2014

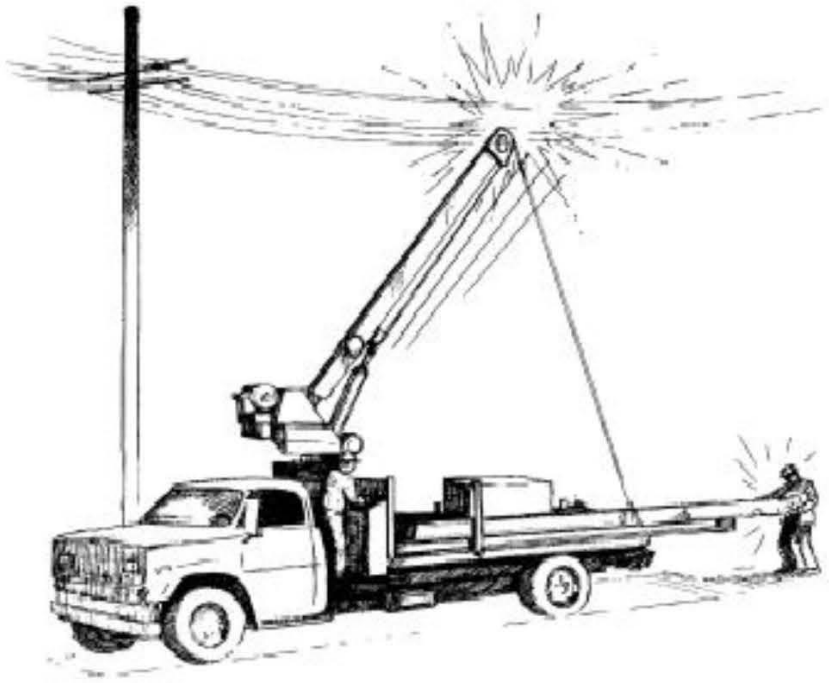
Training

Navy Crane Center 14-T-2H

Navy Shore Weight Handling Training Brief!

Title: What is the Organizational Influence on the Deckplate?

Target Audience: Navy Shore Weight Handling Program Managers



As a Management Team what kind of message is being portrayed and sent to the workforce. The fourth human factor to evaluate in causal analysis is that of the Organization itself. Several ways an organization can close switches for accidents and deficiencies to occur are:

Resource/Acquisition Management

- Poor Manning
- Inadequate safe equipment
- Wrong equipment for tasking

Organizational Climate

- Sporadic Chain-of-command support issues
- A safe workforce is not continually reinforced
- Unspoken culture that undermines safe practices is allowed to exist

Organizational Processes

- Operational tempo exceeds capabilities of group
- Engineered procedures poorly written or do not support the detail needed by the personnel executing the procedure
- Lack of oversight to assess and validate a healthy organization

When an accident/deficiency occurs causal analysis should look at the decision for the unsafe act, the preconditions, and supervision but it must also ask which switch answers "Why is the organization accepting/influencing these?"

23 October 2014

Training

Navy Crane Center 14-T-02I

Navy Shore Weight Handling Training Brief!

Title: What actions do I take after Causal Analysis?

Target Audience: Navy Shore Weight Handling Program Managers

Good causal analysis leads to two types of actions: **preventive** and **corrective**. Depending on whether you are analyzing a surveillance finding, near miss, or an accident helps to determine what type of action is necessary.

Preventive: This action is to **prevent** an **occurrence**. Causal **analysis identified** that there **wasn't** a **violation** or **deficiency**, yet the **current process**/actions have a **potential** for that to **occur without** taking **action**.

- **Involve** the **workforce** in the solution.
- **Don't** try to **solve "world hunger"** with one action.
- **Keep** the action **simple** enough. More administration and processes do not necessarily make it a better action.

Corrective: This action is to **prevent recurrence**. A **violation** or **deficiency** has **occurred** and once the root **causes** are **identified** appropriate **actions** need to be **put in place**.

- Need to be **swift** to prevent recurrence.
- **Assign responsibility** and a timeline.
- **Consider** whether **other areas** are **susceptible** to same problem.

Good actions are a reflection of good information and causal analysis. To ensure that the half life of the frequency of an event is longer, the actions must be committed to at all levels of HFACS for resolution.

20 November 2014

Training

Navy Crane Center 14-T-02K

Navy Shore Weight Handling Training Brief!

Title: Assessing the Health of your Program

Target Audience: Navy Shore Weight Handling Program Managers

A healthy Weight Handling Program includes an effective **surveillance** component to **find "it" before "it" finds you**. **Human Factors Analysis Classification System (HFACS),** a proven method, can then be used in **causal analysis.** Following **identification** of the **causes,** appropriate **corrective/preventive actions** are put in place.

Assessment is the process of going back and validating that the **corrective/preventive actions** have **corrected** the **causes.** If the actions are effective, your assessment should identify the **significance** of the **"its"** are **lowering** over time. A healthy weight handling program will have a longer half life for reoccurrence of the **"its".**

Weight Handling is an ever-changing environment. Each new lift brings about risk(s). Every activity must assess their program to ensure that their **Safety Triangle** is **healthy and effective. The Navy needs safe and reliable weight handling to complete its mission.**

4 December 2014

Training

Navy Crane Center 14-T-02L

SUMMARY OF WEIGHT HANDLING EQUIPMENT ACCIDENTS
FOURTH QUARTER FY14

*T*he purpose of this message is to disseminate and share lessons learned from select shore activity weight handling equipment (WHE) accidents, near misses, and other unplanned occurrences so that similar accidents can be avoided and overall safety can be improved.

For the fourth quarter of FY14, 77 Navy WHE accidents (57 crane and 20 rigging), were reported. Of these, 17 (22 percent) were considered significant (overload, dropped load, injury, two block, crane derailment, or contact with power lines). The total number of accidents decreased slightly from the previous quarter, but the percentage of significant accidents remained the same. Forty percent of the rigging gear accidents were considered significant. Contractors reported seven WHE accidents, including two significant accidents.

INJURIES

Accidents: Four injuries were reported, including two injuries in which personnel were struck by objects that resulted from dropped loads. One of the injuries was reported as a Class "B" mishap as defined by OPNAVINST 5101.1. A rigger sustained a severe hand injury during a rigging evolution when a wood block slipped from its rigging and struck the rigger on the right hand. A rigger was also injured when staging clamps securing a section of staging used as an attachment point for a chain hoist failed, causing the chain hoist and load to fall three feet and strike the rigger. A track walker lost focus of his surroundings and was struck and injured by the crane. An assist worker suffered a hand injury while hand manipulating the eye of an equalizer sling on the lifting leg of a load handling fixture.

Lessons Learned: Two of the four personal injuries were related to dropped loads and personnel working within the fall zone. NAVFAC P-307 prohibits personnel from placing any part of their body under a moving load. Additionally, it is recommended that all personnel keep their eyes on the load until it is placed in a safe and stable condition. In these two events, both dropped loads occurred as a result of improper rigging. In the case of the first injury, the rigger used an incorrect rigging technique that was observed but not questioned by more experienced riggers. Forceful back up could have prevented this accident. Personnel should not be discouraged from stopping and correcting observed deficiencies on the spot. Prior to commencing any weight handling operation, be sure to discuss the rigging method and path to ensure all personnel are well informed and prepared to safely perform the work. The lead rigger or rigger-in-charge should pause,verify that the load is properly rigged and stable, prior to continuing the lift.

OVERLOADS

Accidents: Seven overload accidents occurred (four rigging gear overloads and three crane overloads). Overloads continue to be the most frequently reported category of significant accidents. A floor crane was overloaded, causing the left leg to collapse and the crane to overturn. Synthetic slings were overloaded when the contractor failed to account for sling

capacity reduction due to sling angle. The tail stock piece of a one-ton chain hoist separated during in-hull rigging of a section of scrap material. During rigging operations of a component shipboard, an eyebolt was overloaded and failed at its shank. During hoisting operations with a Category 3 crane, the hoist wire rope parted when it hung up on a submerged object, allowing the hoist block to fall to the sea bed. A Category 3 crane was overloaded during a lift of a rotary table that weighed more than expected. A bridge crane was overloaded when the predetermined stop point was exceeded.

Lessons Learned: The causes for the overload accidents during this quarter include improper operation, improper rigging, and inadequate job planning. In order to prevent accidents like these, activities should stress the importance of following the process. Details are discussed in NAVFAC P-307, Section 10, Operation Safety, and include requirements for ensuring all lifts are executed in a safe manner. It cannot be stressed enough that activities should review these requirements frequently with all weight handling personnel. Also, ensure personnel maintain a questioning attitude. This attitude should be expected in all phases of the job, including pre-job planning and the pre-job brief.

DROPPED LOADS

Accidents: Four dropped load accidents during the quarter, including two that resulted in personal injury as identified the INJURIES paragraph above. In another instance, a load was dropped when the slings that were placed over the blades of a forklift slipped off. Lastly, a dropped load occurred when an incorrectly installed (un-torqued) swivel hoist ring unthreaded, causing one end of the load to drop to the deck.

Lessons Learned: The majority of this quarter's dropped load accidents occurred as a result of improper rigging and could have been prevented through pre-lift preparation and job planning. Crane teams and riggers must be briefed on all facets of the job, including weight of the load, in order to ensure gear is adequately selected. Loads should always be rigged to prevent the load from falling out of the rigging. When using slings in a sweeping configuration under a load, the slings should be secured in place to prevent inadvertent shifting or movement of the load. Frapping (line or rope) should be used to secure the load within the rigging configuration. This is extremely important when lifting a load with a high center of gravity. Supervisors must ensure that the work assigned is briefed and understood by all personnel and visit the job site frequently to ensure compliance.

TWO BLOCK

Accidents: Three accidents involving two-blocking were reported (two crane and one rigging). A crane was two-blocked due to improper operation, causing damage to the hoist wire rope, requiring replacement. During a facility inspection, a chain hoist was identified with damage due to two-blocking. The upper limit switch control bar was found damaged on three separate Category 3 cranes inside the same building.

Lessons Learned: Improper operation was identified as the cause for each of the two-block accidents, and these accidents could have been prevented if the operators were attentive to the location of the blocks and operated in a slow and controlled manner. Two-block accidents have the potential to result in significant damage and/or personnel injury; therefore, it is vital that the safety features are tested properly and operators are trained to approach limit switches in slow speed. Operations should not commence unless all of the safety devices identified are working properly; if a device is not working properly or stops working properly, operations must stop and the crane must be removed from service.

DERAILMENT

Accidents: A crane derailment occurred when a portal crane's truck wheel came off the rail as it traveled through a crane rail switch that was not properly aligned.

Lessons Learned: Personnel error and inadequate communication were identified as the causes for the derailment identified above. The operator traveled the crane in the wrong direction into a rail switch that was not aligned for travel. This accident could have been prevented if personnel would have communicated and ensured that the rail switch was properly aligned prior to traveling the crane, regardless of direction of travel. It is vital that personnel operate in a slow and deliberate manner and are aware of their surroundings prior to commencing operation. Posting temporary placards on cranes identifying forward and reverse can serve as a helpful tool for operators.

Fifty four percent of the reported crane accidents were crane or load collisions. In most cases, the cause was attributed to improper operation. Activities should brief personnel on the need to remain focused, exercise good judgment, and operate in a slow and controlled manner at all times. Supervisors should stress the importance of pausing prior to conducting each lift in order for personnel to identify possible collision hazards or obstructions. On a positive note, 30 percent of the reported collisions did not result in any damage beyond paint scraping. Identifying, investigating, and reporting these events is a very healthy way of learning from minor events and decreasing the potential for major events occurring.

Near misses identified during the reporting period suggest that many activities are realizing the benefit of a sound weight handling near miss reporting program. The number of near misses remains at a high level as 56 near misses (47 crane and 9 rigging) were reported during the fourth quarter. It should be noted however, that crane near miss reports were substantially higher than rigging gear near miss reports. Based on the high percentage of rigging gear accidents considered significant (40 percent), managers should encourage all personnel to increase their observations during the performance of rigging operations. Remember, observations contribute directly to the identification of near misses and prevention of accidents. The majority of near miss reports this quarter involved identification of dynamic deficiencies, suggesting that personnel are involved in observing ongoing weight handling operations. The number of near miss reports submitted during FY14 increased 22 percent compared to FY13. Improper rigging, improper operation, and inadequate equipment inspection were primary causes identified for the reported near misses.

A specific example occurred when a lift was stopped prior to lifting a component that was still attached to its foundation. A fastener that was painted over was identified after personnel reached the stopping point on the in-line load indicating device. A second accident was prevented when personnel identified rigging gear that was undersized for the load about to be lifted.

Weight handling program managers and safety officials should review the above lessons learned with personnel performing weight handling functions and consider the potential risk of accidents occurring at their activity. Activities should consider focusing their attention on rigging operations in order to reduce the number of significant accidents by implementing increased oversight and briefing their personnel on actions needed to reverse this negative trend. Again, a higher than expected injury rate attributable to personnel being struck by dropped loads is concerning. Activities are encouraged to take the time to brief their personnel regarding these recent injuries and ensure that measures are in place to prevent such occurrences at their activity. Navy shore weight handling operations occur in unforgiving high-risk operating environments that require continuous rigorous oversight and compliance with stringent program requirements. Each activity is encouraged to adopt the NAVCRANECEN goal of zero significant accidents. 

TIP OF THE SPEAR
(Notable Evaluation Items)

Program Management

Several activities have demonstrated significant weakness in the oversight and operation of category 4 cranes. In many cases, these cranes are not operated by "core" weight handling personnel and are instead being operated by support codes and shops (utilities, supply, etc.) with little oversight by experienced weight handling personnel. For example, at one activity, during pre-use checks of a category 4 crane, our evaluation team identified significant lack of knowledge and proficiency, as the operators were unfamiliar with some features of the equipment. Additionally, two of the crane's most critical safety checks were not performed correctly.

Another common issue has been the difficulty in developing a robust surveillance program. The majority of Navy activities have implemented such a program; however, in many instances, few deficiencies, poor practices, and improvement recommendations are being identified and recorded. However, at many activities, the surveillance program has been limited to oversight of operations only rather than being been expanded to cover other areas such as rigging gear, training, maintenance, and load test. For example, at a recent evaluation of a small activity, the activity had documented 65 surveillances in the six months preceding the evaluation; however, only three deficiencies were identified, and all of the surveillances were performed in the operations area. Our evaluation teams frequently see poor practices, skipped procedural steps, and unsafe acts while observing operations during the short time the evaluation takes place. Self-identification and dissemination of such errors would enable the entire activity's awareness of the need to do the job correctly and safely.

Operations

Operational risk management (ORM) is a key aspect of safe lifting and handling. However, at many activities, we observe operations where crane teams do not incorporate sufficient ORM into their daily lift planning. This compromises the crane team's ability to minimize risk and indicates that ORM has not become an automatic part of the decision making methodology, contrary to NAVFAC P-307 and overall Navy policy. Examples identified recently of not incorporating sufficient ORM include:

- When swinging a load pier side, the rigger-in-charge (RIC) allowed the load to remain unnecessarily high (head level), rather than lowering the unit closer to the ground, allowing better control.

- There were several instances of taglines being too short, limiting the ability to safely control the load and causing personnel to come unnecessarily close to elevated loads. During another evolution, the rigger controlling the test weights held onto the tagline too long and unnecessarily came upon a trip hazard (shore power cables and mooring lines) at the edge of the berth before letting go.

- During travel operations, a crane (track) walker did not check outside the gantry immediately adjacent to dry dock ingress/egress route, contrary to NAVFAC P-307, paragraph 10.2.1.3.

- During removal of scaffolding from a tended unit, the rigger on the pier had to stop operations to correct the signalperson on the ship to boom up, so the load would not pass over the brow.

- During removal of a ship's antenna utilizing a chain hoist, the riggers did not tie off the hand chain (done to prevent inadvertent lowering of the load in the event of a chain hoist brake failure).

Pre-job briefs are a critical element of safe lifting and handling. Sometimes, our evaluation teams identify pre-job briefs that could be improved. For example, at one activity, the evaluation team observed a crane team briefing for a lift involving two high value components. The brief was adequate to support conducting the lift; however, the briefing location was not ideal as it was in a high personnel traffic area and adjacent conversations were distracting. Additionally, the briefing was not interactive among all team members, as only three members actively participated.

Maintenance, Inspection, Test, and Certification

At one activity, evaluation team prompting was required to prevent stacking of test weights where the lifting attachment was not marked for the total capacity on the attachment, contrary to NAVFAC P-307, paragraph 3.7.1.1. Additionally, numerous test weights had bent lifting attachments that had not been evaluated to ensure they were safe for continued use.

At one activity, the inspectors were not aware of the requirement to test the secondary limit switch by bypassing the primary limit switch, contrary to request for clarification, deviation, or revision (RCDR) 14-032 distributed via Naval Message P 171716Z JUL 14.

Contractor Cranes

At one activity, two contractor cranes did not have a certificate of compliance (NAVFAC P-307, figure P-1) on the crane and one of the P-1s at the contractors office did not have all of the attributes (i.e., did not identify the contracting officer's point of contact or phone number, prime contractor/phone number, contract number, nor the applicable ASME standards for the rigging gear and attachments).

Engineering

At one activity, sufficient data (e.g. component failures, equipment usage) was not being maintained to assist management in identifying trends with regard to equipment reliability. Additionally, the limited trending that was occurring was not formally documented and was dependent on the knowledge of the engineering staff.

At several activities, weight handling equipment deficiency reports (WHEDRs) were not submitted for deficiencies that were detected that could have applicability at other Navy activities, contrary to NAVFAC P-307 paragraph 2.1.1.

Rigging Gear

At one activity, the evaluation team identified that a swivel hoist ring's (SHR's) bail would not rotate freely, contrary to NAVFAC P-307, paragraph 14.8.8. Additionally, SHRs and eyebolts did not have any thread protection, which was noted to the activity as a poor practice.

At one activity, three portable manual hoists (two uncertified and one certified) were found with twists in the load chain, contrary to ASME B30.15, paragraph 16-2.5.2.e. The activity determined the condition was the result of prior improper maintenance.

At one activity, there were ten alternate yarn round slings, where the minimum pin size allowed for use was not marked on the slings. Additionally, for eight of the slings, the certificate of proof test did not include the diameter of the pin used during the actual proof test, contrary to NAVFAC P-307, paragraph 14.7.4.3.4(d).

Training

At one activity, shop personnel were rigging pumps and motors out of buildings utilizing manual chain hoists suspended from building beams. These personnel had not been trained as riggers, contrary to NAVFAC P-307, paragraph 13.2.6.

At one activity, the evaluation team attended a weight handling program training course and identified several items for improvement:

- The instructor did not canvass the background of attendees (i.e., discipline, qualifications, job assignment) at the start of the training to better tailor the training (specific examples, more detail in certain areas, etc.) to the specific audience. Additionally, the instructor asked general questions to the group as a whole rather than to specific individuals. The evaluation team noted that if questions were directed to specific individuals based on their discipline, qualifications, job assignments, it would heighten their level of attention and engagement.

- There were some missed opportunities to reinforce expectations and requirements during the training. For example, during the lessons learned portion of the training, the instructor discussed a recent problem involving poor turnover between crane maintenance crews. Although the instructor identified that the event was due to poor turnover, a better approach would have been to include a review of the expectations/requirements for maintenance crew turnover.

THREE 2-TON ORDNANCE HANDLING BRIDGE CRANES TORPEDO ASSEMBLING FACILITY

The Navy Crane Center accepted three 2-ton ordnance handling bridge cranes at a torpedo assembly facility. These three cranes were procured to replace three older cranes. The cranes are under-running single girder bridge design with an under-running trolley and hoist. The bridge spans were about 21 feet and a maximum hook height of 11 feet 3 inches. Each bridge crane is located on its individual runway to service a different work center. All of the cranes are electrically powered and controlled from suspended pushbutton stations. The cranes were designed and fabricated to comply with CMAA 74, Crane Service Class D, and MMA MH 27.1, Duty Service Classification D, and the packaged hoists complied with ASME HST-4, Duty Service Classification H4 requirements. Because the facility was actively working, Navy Crane Center planned and coordinated the crane installation and acceptance efforts with the supported command, contractor, and the certifying official to minimize impact on the facility operations.

25-TON CRANE B431 PUGET SOUND NAVAL SHIPYARD

The Navy Crane Center accepted a 25 ton rated capacity bridge crane at Puget Sound Naval Shipyard and Intermediate Maintenance Facility. The crane is a double girder bridge design with a 5-ton auxiliary hoist. The crane has a bridge span of 51 feet and a maximum hook height of 24 feet 6 inches. A 20-ton crane was removed from the facility prior to installation of the new crane. The crane is radio controlled and designed to operate on 230 VAC, 3-phase, 60-Hertz power fabricated to comply with ASME B30 and CMAA requirements. The crane was provided with a skeleton cab that has a seat and a stand so the operator can move the radio control to the skeleton cab.

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.

Note: ***Load Testing Mobile Cranes at Naval Shore Activities*** is currently being updated to address the revised load test procedures in the December 2009 edition of NAVFAC P-307.

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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