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A WORD FROM TOPSIDE

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Last quarter, I challenged you to help me reverse the negative trend that the Navy was experiencing with regard to the ratio of significant accidents, as defined by NAVFAC P-307, which was higher than in recent years at 27 percent. I am pleased to note that in the last two months, few significant accidents have occurred and the percentage is now close to 25 percent. I am confident that we can continue this trend and have an even better FY20.

As we review accident reports and conduct on-site evaluations, we have recognized a potential trend with regard to supervisory performance. I say potential, because I am not yet confident in what the data, or lack of data, is telling us. Our views on supervisory engagement/involvement are visible to us as: (1) accident reports, (2) supervisor performance as provided in monitor program data, and (3) our observations of supervisory engagement during weight handling program evaluations. I want to discuss each of these independent data streams separately. I want to make it clear that this potential lack of supervisory engagement should not be viewed, in most cases, as personnel error as it is most likely not intentional. Similar to the Navy's overall civilian workforce, the experience level of both deckplate personnel (e.g., riggers, operators, and assist trades) and supervisors is very low. Just as with deckplate personnel, supervisors need on-the-job mentoring by more senior supervisors and managers to develop and mature the supervisory skills

needed to execute the Navy's critical mission.

- Accident Reports – In many instances, accident reports dive right down to the event that happened on the deckplate, pier, drydock, shop, construction site, etc., basically, to what is perceived as the “real cause” of the problem. These reports typically do not include a discussion with regard to supervisory engagement in the evolution. For example, did the supervisor make the job assignments?; did the supervisor have a good understanding of the task at hand?; did the supervisor attend the pre-job or pre-shift brief?; did the supervisor ensure the crane or rigging team had an adequate skill mix and experience for the job?; if not, what mitigating actions were taken? In some instances, our accident branch or evaluation teams are identifying lack of adequate supervisory engagement as a contributing cause when warranted. Your accident investigations, per NAVFAC P-307, paragraph 12.6.2 should evaluate supervisory engagement and comment, either positively or negatively, on the effect on the evolution.

- Monitor Program – NAVFAC P-307, paragraph 2.6 discusses monitor program requirements. At a minimum, weight handling program managers and supervisors are required to participate in the program and other personnel involved in the program are highly encouraged to participate.

With regard to supervision, first level supervisors should be among the best at identifying poor practices, deficiencies, and process improvements, and a key aspect of their job should be to provide supervision, oversight, and mentoring to their employees. Management's role in the monitor program, to include second level supervision and above, cannot be understated. Management's focus when conducting oversight should be to focus on the supervisor's performance using the aspects of the job discussed above, as these aspects are typically absent from observations documented by others participating in the program.

- NCC Observations in the Field – In some instances during evaluations, our evaluation teams identify a lack of supervisory presence in the field. We understand that supervisors cannot be at every lift; however, in some instances we identify in-progress complex lifts with no supervisory involvement, in addition to undermanned crane teams where there is no supervisory presence or mitigating actions being taken. Too often, our teams observe numerous lifts each day and encounter no supervision or

management. From our viewpoint, if we see a lack of supervisory presence on the deckplate when everyone knows it is evaluation week, what are we to think happens the rest of the year when we are not on site? I pose this question not to get you to react differently during our periodic evaluation, but to get you to assess what your activity's expectations are with regard to supervisory oversight during day-to-day weight handling operations in the field.

Please consider these thoughts and how they may relate to your specific program. Remember, our goal, and by that I mean NCC's and your activity's goal, should be to continuously make slight adjustments and improvements in your weight handling program. I do not expect you to take drastic steps or adjustments. Please review the above thoughts with your weight handling program leadership and take a look at how your activity performs in the specific areas discussed above. If you see shortcomings or gaps in one or more of these areas, I recommend that you take at least one meaningful corrective action that will have a positive effect on performance in the area of concern.

TIP OF THE SPEAR FISCAL YEAR 2019 EVALUATION SUMMARY

In Fiscal Year 2019 (FY19), Navy Crane Center (NCC) initiated a quadrennial evaluation program for activities with limited weight handling equipment inventories that present low risk, as permitted by SECNAV Instruction 11260.2B. Approximately half of the Navy activities, detachments, remote sites, squadrons, and units with weight handling (WH) programs are considered to have low risk programs. To maintain communication with these activities, NCC initiated a Liaison program where NCC evaluation personnel contact assigned activity WH points of contact to discuss WH issues, answer questions, and offer assistance with program matters.

SUMMARY OF PROGRAMS EVALUATED

146 Navy WH programs were evaluated in FY19. [Versus 160 Navy WH program evaluations in FY18.]

Two equipment reviews at Seabee deployment camps and five non-Navy program evaluations were also performed. 142 Navy programs were fully satisfactory. Four were marginally satisfactory. [Versus 4 in FY18.]

No activities had unsatisfactory programs. (100% satisfactory rate). [Versus 100% in FY18.]

SATISFACTORY CRANES

For FY19, 125 of 150 cranes were satisfactory for evaluation purposes (83%). [Versus 89% in FY18.]

Reasons for Unsatisfactory Cranes.

Eight brakes were out of specification. Three cranes had load test issues. Two crane alterations were not in accordance with the approved crane alteration request (CAR):

Hoist holding brake out of specification (6 brakes).

Trolley brake out of specification.

Portal crane travel brake out of specification.

Crane not properly load tested (3 cranes).

Crane did not meet the requirements of the approved CAR (2 cranes).

Gouged brake solenoid armature, release mechanism, and housing.

Overload limit switch setting exceeded OEM specification.

Trolley wheel spacing not in accordance with OEM specification.

Portal crane rotate function inoperative.
Secondary limit switch did not operate as designed.

Load chart missing from crane.
Tension rods for crane runway were removed.
Secondary limit switch activation not verified per CSA 102.

Load chain measurement exceeded allowable.
Radius/boom angle indicator out of specification.

EVALUATION ITEMS

19 activities had Significant Items. [Versus 17 in FY18] A significant item is an issue that the evaluation team determines to be a higher-level area of concern that presents a significant deficiency or vulnerability to an activity's WH program. Significant items typically require immediate management attention to address, evaluate, and determine effective corrective actions to mitigate the deficiency or vulnerability.

Common Evaluation Items (compared to FY18):

- Lack of monitor program or established program that needs improvement or does not cover all program elements – 121 items. [120]

- Weakness in (or non-existent) activity self-assessments, self-assessments not acted upon, not internally focused, not developed utilizing documented monitor or metrics data – 70 items. [17]

- Various unsafe crane and rigging operations observed by the evaluation 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.) – 72 items. [60]

- Lack of leading metrics/metrics not being properly analyzed – 54 items. [22]

- Operator's Daily Check Lists/Operator's Monthly Check Lists (ODCLs/OMCLs) and simulated lifts performed incorrectly or not performed - 53 items. [47]

- Operators/riggers/inspectors/test directors lacked essential knowledge (recognizing crane accidents, complex lifts, knowing the weight of the load, how to connect special equipment, etc.) – 52 items. [49]

- Training issues, including contractor personnel training not taken, training weak or not effective, refresher training not taken or not taken within three months of license renewal, lack of inspector training, instructor not authorized by NCC, locally required training not taken, training course score less than 80 percent, non-Navy eLearning (NEL) certificates) – 51 items. [55]

- Lack of (or low number of) lower order crane accident/or rigging accident and near-miss reports – 43 items. [32]

- Lack of, ineffective, or insufficient crane replacement/modernization plan – 38 items. [22]

- 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 2 years, license not in possession of operator, operating with expired license/training, operating with no license) – 35 items. [31]

- Rigging gear, containers, brows, test weights, etc., not marked properly or marking not understood by riggers (including illegible marking, mismatched components, SPS vs GPS, pin diameter not marked on alternate yarn roundslings) – 33 items. [28]

- Operator's Daily Check Lists/Operator's Monthly Check Lists (ODCL/OMCL documentation deficiencies (including incorrect form used and pre-completed forms) – 32 items. [34]

SUMMARY OF WEIGHT HANDLING EQUIPMENT ACCIDENTS THIRD QUARTER FY19

The purpose of this message is to disseminate and share lessons learned from select shore

activity weight handling accidents, near misses, and other unplanned occurrences so that similar

events can be avoided and overall safety and efficiency of operations can be improved.

For the third quarter of FY19, Navy activities reported 78 total crane and rigging accidents (66 crane and 12 rigging). Of the 78 accidents, 22 were significant (19 crane and 3 rigging). While the significant accident rate lowered slightly this quarter (28 percent) as compared to last quarter (29 percent), the significant accident rate remains high. Additionally, two of the events were OPNAV Class C, an injury that resulted in lost time and damage to ship's equipment that cost more than \$50K to repair/replace. Personnel injury was the leading category of significant accidents reported this quarter (8), followed by overloads (7), two-block accidents (4), and dropped loads (3). For injuries, this was the highest quarterly total compared to any quarter in the previous 3 FYs. Of the remaining accidents, damage due to crane collisions continued to be the top non-significant accident (23). On a positive note, 22 percent of the collisions were lower threshold accidents and resulted in no damage to the load or equipment. Contractor crane accidents decreased to 10 in the third quarter compared to 13 in the second quarter; however, 4 were significant (all dropped loads). All of the dropped loads (buoy, anchor chain, steel beam, and a 6-ton hydraulic jack) were severe and fortunately did not result in personnel injury. An increase in contractor crane near misses were reported this quarter, up to 10, which is a positive as no contractor near misses were reported in the previous quarter.

INJURIES

Six crane and two rigging accidents resulted in injuries. A sailor was injured while utilizing a tilt fixture to rotate a propeller from vertical to horizontal (OPNAV Class C). Two employees were injured when a brow was disconnected from a ship prior to the crane slings having full tension applied. A sailor suffered an injury when his arm was caught between a shipping tray fixture and the load during shipboard installation. While placing a wire rope sling on a crane hook, a rigger's hand was pinched between the sling and the hook. A category 3 crane operator suffered a finger injury when his finger was caught between the crane hook and a sling used to lift the load. A rigger suffered a leg injury when the steps of an accommodation ladder folded while placing weights on the steps during load testing of the ladder. A sailor was struck in the lower back when the base of a fan dislodged from the rigging arrangement. An employee suffered a hand injury when a sling slipped off the edge of a load suspended by a forklift equipped with a boom extension.

Lessons Learned: For the OPNAV Class C propeller injury and the accommodation ladder leg injury, procedures detailed the installation of pins to lock rigging and the ladder in place; however, personnel complacency resulted in a failure to verify the pin was properly installed. Also, in the case of the accommodation ladder, schedule pressure was a factor. Four injuries (shipping tray, category 3 crane finger injury, sling on the hook injury, and the forklift load injury) were the result of poor operational risk management. All of these accidents were the result of personnel placing themselves or body parts in pinch points. The reports for the brow injury and the fan injury both listed inadequate briefing as contributing factors. The brow was released prematurely by ship's force before adequate tension was applied to the lifting slings, causing the brow to swing into the riggers. The fan was not adequately inspected to verify all parts were encapsulated in the rigging arrangement prior to lifting.

OVERLOADS

There were seven overloads (six crane and one rigging). Rigging gear was overloaded in all seven accidents, and a category 3 crane was also overloaded. A procedure's pre-determined load limit was exceeded and a shipboard system was damaged resulting in a costly repair (OPNAV Class C). A category 3 crane and rigging gear were overloaded when the slings snagged a workbench while hoisting. A lift fixture was overloaded causing a crack in the fixture's weld. A 25-ton chain hoist and attached lifting beam were overloaded during a crane lift. A shackle was overloaded during removal of a portable gantry crane from a trailer. A one-ton chain hoist was overloaded when a handling tool being removed snagged shipboard support equipment. A beam clamp was damaged during a crane lift but was not immediately identified (subsequent investigation determined the beam clamp was overloaded during crane operations).

Lessons Learned: The majority of these accidents employed load indicating devices (LIDs); however, in most cases, the LIDs were not monitored or the lift was allowed to proceed past established stopping points. When activities encounter conditions that are not per plan or as briefed, the lift should be stopped or paused. At that time, an additional brief should take place to discuss the unusual conditions and determine the way forward, which may include stopping the lift entirely and regrouping, briefing the new process and method, etc.

The category 3 crane and rigging gear overload occurred once the lift was complete and the hook was being raised clear of the load. The operator was not focused on the gear hanging from the crane hook. Two overloads occurred as the rigging gear was either side loaded or sling angle tension was not taken into account during the lift. The greater the angle, the more tension will be applied to the rigging gear. Look for an upcoming NCC-issued weight handling program brief, which discusses sling angles in more detail.

TWO-BLOCK

Four two-block crane accidents were reported. A mobile crane was two-blocked during operation to prepare the crane for travel. A category 3 jib crane was two-blocked during no load operations. A category 3 hoist was two-blocked when the hoist was operated in the wrong direction due to electrical power phase rotation changes in the building. The wire rope end fitting on a hydraulic gearbox test stand "two-blocked" into the top sheave assembly due to operator error.

Lessons Learned: Improper operation was the main cause for all of these accidents. A contributing factor involved not performing as trained (complacent). Additionally, in the case of the mobile crane, the crane was being configured for travel and the operator was operating the crane in by-pass mode without a rigger giving signals as required by the activity's local procedure. The jib crane was being stored and the operator was not focused on the speed of the hoist or proximity to the limit switch. The phase issue could have been avoided if the operator would have ensured control action of the pendant controller during the operator's pre-use check. In this case, if the operator had been watching the hook block upon initial activation of the pendant controller this could have been averted. The hydraulic gearbox was a specialty piece of equipment that has since been equipped with a limit switch to help prevent this from occurring in the future.

DROPPED LOADS

In addition to the dropped loads associated with injuries discussed in paragraph 3, three additional dropped load crane accidents were reported. During a lift of a conveyer belt, a lifting point separated causing one end of the belt to drop to the shop floor. Fasteners attached to the cover of a load were damaged when the load slipped out

of the rigging and dropped about a foot to the pier. While lifting two flask containers stacked on top of each other, the top container, which was not secured to the bottom container, fell out of the rigging to the shop floor.

Lessons Learned: Improper operation was the main cause for all of these accidents.

These accidents were attributed to not following procedure (flask accident), unfamiliarity with equipment (operation of the mobile crane), poor communication, and inadequate inspection of the load. In the flask accident, flasks were supposed to be lifted one at a time and not stacked. Additionally, the rigging gear did not encapsulate the load within the rigging configuration. The dropped cover occurred when the mobile crane operator pressed the wrong direction on extend/retract foot pedal while attempting to extend the boom (boom was retracted instead). The conveyor belt lift did not come with a lifting sketch and there were language barriers with the contractors of the equipment. As a result, contractor personnel on site were not able to adequately communicate the potential issues with rigging the belt.

NEAR MISSES

On a positive note, activities reported 104 near misses this quarter (84 crane and 20 rigging), which is the highest quarter total in the last 3 FYs. Examples of good near misses included the following. The set-up of a mobile crane was stopped when the rigger identified a potential sub-surface defect in the concrete pier. A lift was stopped when a fastener was found still attaching the load to the foundation. While starting to up-end an empty load tube, a mechanic noticed that the load was still bound and stopped the lift. Travel of a portal crane was stopped when the trackwalker observed that the crane would not clear a ship's service platform. Rigging of a rotor was stopped when personnel identified that the rigging procedure being used would pose unacceptable risk/damage to the rigging gear and rotor. Quick thinking by individuals in these events prevented accidents, some of which could have been significant.

UNPLANNED OCCURRENCES

Activities reported 37 unplanned occurrences (25 crane and 12 rigging). An unplanned occurrence describes an event that does not meet the definition of a crane or rigging accident but results in injury or damage to a crane, crane component, or related equipment due to an event not directly related to a weight handling operation.

Notable unplanned occurrences included the following: Mechanics inadvertently used oil when changing hydraulic fluid.

Port operations tugs were moving a floating crane and the crane's boom whip line contacted a shore power boom structure on the pier.

The electrical insulation around a pendant control cable was damaged (melted) when it was left stowed against a ceiling mounted heating element. The load chain of a shipboard mounted chain hoist released from its end connection and damaged staging. An electrical wire was pulled from its connection while a valve was being lowered into position by hand.

Weight handling program managers, operations supervisors, contracting officers, 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. I am particularly concerned with the high percentage of significant accidents and in particular, the number of personnel injuries reported this quarter. At no point should even one personnel injury be considered acceptable. Your help is needed to reverse this trend and reduce significant accidents. Data reported in the third quarter of FY19 indicates an increasing trend in reporting of Navy and contractor near misses; however, the significant crane accident trend for the Navy and for contractor cranes declined only slightly and remains high. Bravo Zulu to activities that have reported near misses this quarter. Please continue to monitor ongoing crane and rigging operations. Make your presence in buildings and on the waterfront count.

WEIGHT HANDLING PROGRAM BRIEFS

Weight Handling Program Briefs (WHPBs) are provided for communication to weight handling personnel. The following briefs were issued during the past quarter.

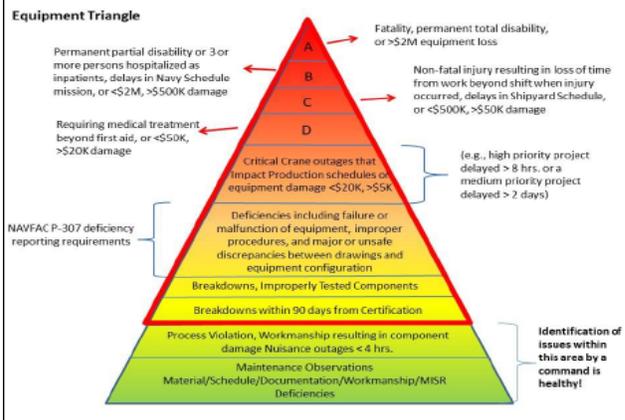
The briefs are not command-specific and can be used by your activity to increase awareness of potential issues or weaknesses that could result in problems for your weight handling program. They can be provided directly to personnel, posted in appropriate areas at your command as a reminder to those performing weight handling tasks, or used as supplemental information for supervisory use during routine discussions with

their employees. When Navy Shore Weight Handling Program Briefs are issued, they are also posted in the Accident Prevention Info tab on the Navy Crane Center's web site at <http://www.navfac.navy.mil/ncc>.

Navy Crane Center point of contact for requests to be added to future WHPB distribution is Tracey Simpson (tracey.simpson@navy.mil).

Navy Shore Weight Handling Program Brief

Title: Equipment Triangle and Healthy Weight Handling Programs
Target Audience: Navy Shore Weight Handling Program Managers



The Equipment Triangle is used to demonstrate the progression of a healthy weight handling program. The goal of any organization is to prevent the upper tier events including the pinnacle event (OPNAV Class A) from occurring, while striving to identify events in the lowest possible level of the triangle. Since we work in an environment where humans do the work or control the equipment, there is always a human error factor to every job.

This means that there are always weaknesses! Weaknesses exist whether identified or not.

The base of the triangle is built on FINDING these weaknesses.

The section of the triangle outlined in red is built on those weaknesses that are not identified,...But find the activity.

It is important to identify weaknesses, evaluate those weaknesses, and take appropriate action to correct them.

The healthier the activity's observation/monitor program and deck plate supervision, the more likely the activity is to recognize common trends, apply meaningful corrective actions, and as a result not progress up the triangle.

SUMMARY: There is always some aspect of the equipment maintenance that can be done better. Are we looking for it, identifying it, putting actions in place to fix it, or do we reside inside the Equipment Triangle where we react when weakness finds us?

Navy Shore Weight Handling Program Brief

Title: "Good" Crane and Rigging Near Miss Reports
Target Audience: Weight Handling Program and Crane Oversight Personnel

During the past few weeks, numerous "good" near misses have been submitted which help prevent accidents. NCC wants to stress the importance of identifying and reporting "good" near misses which can be used for lessons learned at all activities. Look for future weight handling program briefs which recognize other activities, **maybe even yours!**, for identifying "good" near misses. Well done (Bravo Zulu) to the following activities that identified these recent near misses:

- **Portsmouth Naval Shipyard** – A lift of a shaft was stopped prior to tensioning the rigging gear when an accident prevention team (APT) member reviewed the engineered rigging plan and noticed the rigging arrangement did not match the drawing.
- **Norfolk Naval Shipyard** – While lifting a shaft from a lathe, the shaft nearly contacted the lower section of the lathe. The crane team called "all stop" and took action to secure the load.
- **TRF Kings Bay** – A lift of a pump was stopped when the lifting attachment (eye bolt) was identified as not being fully engaged preventing the potential for damage or failure of the eye bolt.
- **PWD Sasebo** – A rigger stopped a mobile crane from setting up outriggers on a potential sub-surface defect on a pier.
- **Fleet Readiness Center Southwest** - Prior to a lift of a gear box, personnel assigned to make the lift identified one of the bolts still remained in the foundation (potential overload averted).
- **PWD San Diego** – A lift of a helicopter was stopped when personnel identified the tagline attached to the helicopter wrapped around a light fixture.

Navy Shore Weight Handling Program Brief

Title: Crane Accidents Involving Overloads
Target Audience: Weight Handling Program and Crane Oversight Personnel

During the first 10 months of FY19, significant crane accidents, as defined by NAVFAC P-307, increased from 37 to 54 when compared to FY18 data. Review of data identified that the primary contributor is overloads during crane operations. Looking deeper, 19 of these events were attributable to overloads of rigging gear during these operations. This WHPB is a reminder to always know the weight of the load and the capacity of the rigging gear. A second WHPB will be forthcoming which will focus on specific details relating to these events.



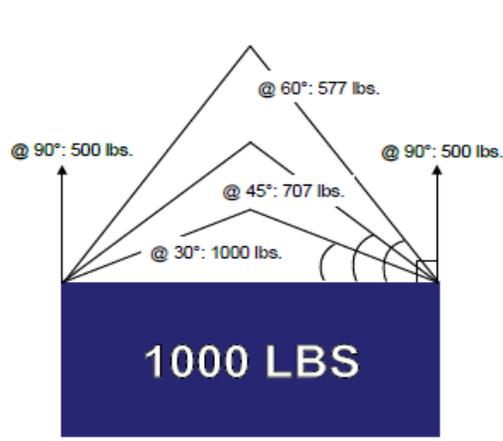
Be alert! Always know the weight of the load, capacity of the rigging gear's weakest link, and capacity of the crane as configured!

During crane operations, knowing the weight of the load is paramount in preventing gear overload!

- **Why know the weight of the load?** Answer: It is important to know the weight of the load in order to select the appropriate gear to be utilized for the lift.
- **Who should know the weight of the load?** Answer: The crane team members should know the weight of the load. Specifically, NAVFAC P-307, section 10, requires that the rigger-in-charge (RIC) and crane operator know or have a reasonable estimate of the weight of the load. The RIC should brief all team members with regard to the weight of the load to ensure teamwork and forceful team backup.
- **How is the weight of the load determined?** Answer: Look for the weight stenciled on the load or look at the equipment drawings. If possible, use at least two independent methods to determine the weight of the load, or alternatively, use a below the hook load indicating device (LID) device or integral LID.

Navy Shore Weight Handling Program Brief

Title: Sling Angle and its Affect on Rigging Gear Capacity
Target Audience: Personnel Involved in the Selection of Rigging Equipment



The load seen by a sling changes based on the angle of the slings.

- In the figure shown on the left, the center of gravity is located in the center of the load. In this case, the load on each sling at 90° [from horizontal] would be 500 lbs, but if the sling angle was decreased to 60° [from horizontal], the added sling angle stress would increase the load on each sling to 577 lbs. As the sling angle continues to decrease, the load seen by each sling continues to increase as shown.
- To prove this point, imagine holding a 10 pound bag of potatoes in each hand. With your arms straight down to your sides, your arms feel 10 pounds each. However, if you slowly raise your arms away from your body, your arms feel more weight even though each bag of potatoes still weighs 10 pounds.*
- NAVFAC P-307 prohibits the use of slings at angles less than 30° [from horizontal] unless authorized by an engineering work document.
- The affect of the **sling angle stress must be considered** when calculating/selecting gear size and capacity.
- Other conditions that must be considered when calculating the load on the sling include, but are not limited to: complex shapes with asymmetrical centers of gravity, attachment points at different locations, and the number of legs/attachment points used in the lift.

Personnel involved in the planning and rigging of loads must calculate the load in each sling and other rigging components to ensure an overload does not occur.

Navy Shore Weight Handling Program Brief

Title: "Good" Crane and Rigging Near Miss Reports
Target Audience: Weight Handling Program and Crane Oversight Personnel

During recent weeks, numerous "good" near misses have been submitted which help prevent accidents. NCC continues to stress the importance of identifying and reporting "good" near misses which can be used for lessons learned at all activities. Well done (Bravo Zulu) to the following activities that identified these recent near misses:

- **NMC CWD Det Lemoore** – A lift was stopped when a crane's hook caught on a retaining pin lanyard preventing damage to the equipment.
- **Pearl Harbor Naval Shipyard** – A potential overload of a portal crane was averted when a supervisor noticed the ground marking for the planned crane's radius was off by one foot.
- **TRF Bangor** – A work leader recognized that a chain hoist was not sized properly to support the weight of a component (bearing), preventing overload of the hoist.
- **Portsmouth Naval Shipyard** – A lift was suspended when two swivel hoist rings attached to the load did not swivel, creating a potential overload condition.
- **Fleet Readiness Center East Cherry Point** – A lift of an aircraft gear box was stopped when the assist rigger identified that a bundle of wires attached to the gear box was still connected.
- **NAVSURFWARCEN Det White Sands** – During a lift of an A-Frame, the A-Frame slid outside of the expected load path; however, the attentive operator and rigger were able to catch the load prior to it colliding with a skid in the area.
- **TRF Kings Bay** – A load chain of a manual hoist was wrapped around a piece of ship's equipment and had to be moved prior to shaft work commencing.

12 September 2019

Navy Crane Center

WHPB-19-13

Navy Shore Weight Handling Program Brief

Title: Crane Accidents Involving Overloads Part 2
Target Audience: Weight Handling Program and Crane Oversight Personnel

A previous Weight Handling Program Brief (WHPB 19-11) reported an increase in significant crane accidents during the first 10 months of FY19 due to **rigging gear overloads during crane operations**. The majority (16 of 19) of accidents occurred as a result of **load binding (constrained lifts), load not free to lift (fasteners or welds left in place), or snagged rigging gear**. The previous brief on overload accidents discussed the need to know the weight of the load. This brief will discuss methods required to prevent overloads that occur due to the conditions listed above.

Methods of Overload Prevention

- Know the weak link (equipment with the lowest capacity) in your rigging gear configuration and do not exceed.
- Ensure load is free to lift by verifying all fasteners or welds are removed. A second check is always advisable!
- Use a portable load indicating device (LID) when overload due to binding conditions is possible. The LID readout shall be readily visible to the signal person, RIC, or designated monitor.
- A LID shall also be used when the removal of all hold-down fasteners/welds cannot be positively verified.
- Stopping points shall be established prior to lift. The LID must be monitored and stopping point not exceeded.
- Chainfalls, preferably, or other control means (e.g., procedures, micro-drives, load positioner/buffer) shall be used to avoid sudden overload of the crane or rigging gear.
- Treat these lifts as complex lifts as described in NAVFAC P-307, paragraph 10.4.1.
- Prevent snagged gear by slowing down and ensuring the gear is clear of all obstacles. Ensure all rigging gear is adequately secured and excess chain is tied off.



The above include a few of the pre-lift preparation tools that can be used to avoid overloads. NAVFAC P-307, paragraph 10.5.2 provides specific guidance for prevention of overload, binding conditions, loss of load, and use of LIDs. If there are any concerns, stop and contact your supervisor or engineering personnel for guidance.

18 September 2019

Navy Crane Center

WHPB-19-14

Navy Shore Weight Handling Program Brief

Title: MOBILE CRANE TWO-BLOCK ACCIDENTS
Target Audience: ALL WEIGHT HANDLING PROGRAM PERSONNEL

Two-Block is defined in NAVFAC P-307 as "over-hoisting by direct hoisting or indirectly by lowering the boom or telescoping the boom so that the hook block and the upper sheave assembly or trolley/hoist frame come in contact, resulting in possible damage to the structure, parting of the hoist line, and dropping of the load."

In July, a two-block accident occurred that resulted in **the main hoist block detaching from the crane**. This was the second two-block to occur within a two-month period on a mobile crane equipped with an anti two-block feature. Both of these events occurred because of improper operation (human error). This brief discusses the events and emphasizes important lessons learned.

PREVENTING MOBILE CRANE TWO-BLOCKS

- In the first event, the operator disabled the anti-two block safety device in preparation to stow the boom and travel the crane. The rigger-in-charge (RIC) signaled the operator to retract the boom and began removing slings from the crane hook. The operator fully retracted the boom and proceeded to lower the boom and raise the hoist without direction, resulting in a two-block. **Lessons learned:** Crane Operator's are required by NAVFAC P-307, Section 10, to make movements during crane operation only when given the direction to do so. Additionally, the RIC performed functions that compromised their control of the evolution.
- The second event occurred during a training evolution when an operator under instruction was making a lift. The operator was instructed to boom down; however, the operator began scoping out instead. The RIC was distracted and not watching the lift while the operator continued scoping the boom until the main hoist two-blocked, breaking the main hoist wire, causing the block to fall to the ground. **Lessons learned:** The RIC was distracted and did not ensure signals were provided to the operator. The operator was under instruction and was not directly supervised by a licensed operator contrary to NAVFAC P-307, Paragraph 8.7.



The pictures above illustrate damage that resulted from a recent two blocking event.

It is important to remember that NAVFAC P-307, Section 10.2.2.3., requires personnel to be thoroughly trained on the operation of safety devices. Additionally, each activity is required to develop procedures to control bypassing of safety devices.

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Navy Crane Center

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DID YOU KNOW?

Working on or around cranes in a wide range of facilities and locations can have many hazards, and various safety measures are taken to mitigate possibilities of injury and collisions. Commonly used methods to alert people of operations around the crane envelope are spotters/guards, physical barriers, and audible horns or sirens. Even with these precautions, accidents still happen within the crane envelope from disregard of warnings, functional issues, or human error. Operators might not have proper

vision of the crane envelope and load from other objects, or miscommunicate with spotters. People might drown out and ignore audible alarms from a combination of being used to the beeping and having hearing protection, or walk through openings in barriers without knowing. To supplement and improve on existing warning devices, overhead warning spotlights may be beneficial.

These warning spotlights most likely would not take the place of the other safety provisions, but they provide a different visual stimulus relative to the movement of the crane or suspended load unlike a stationary barrier. The spotlights are adjustable, easy to mount, and can be configured in single point or multiple formations to fit the type of working environment. Single lights can show the position of the hook over the floor or load to give operators a reference. Multiple lights can convey leading and trailing boundaries of the crane or suspended load. There is also an attachment to the spotlight to display lines rather than points, which can better define safe zones on the ground below moving cranes. The spotlights are visible from up to 100 feet high, and the lines from the attachment can show up to 30 feet down or out.



The system is relatively inexpensive ranging from a few hundred dollars for a single spotlight, to a couple thousand dollars for four spotlights and power supplies.

Many areas of industry already have these warning spotlights in use, such as steel or aluminum manufacturing plants and storage warehouses. As such, the warning spotlight system might be a viable option to consider within Navy Activities to improve safety.



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.

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.

