THE CRANE CORNER

Navy Crane Center Technical Bulletin

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A WORD FROM TOPSIDE

Sam Bevins

We have a golden opportunity to significantly reduce our Navy shore activity accident numbers by exercising the same vigilance when operating an unloaded crane as when operating a crane lifting a load. A number of very serious crane accidents have occurred on all types of Navy-owned cranes, contractor cranes on Navy property, and cranes used in private industry when there was no load being lifted.

Of all Navy shore crane accidents reported in the last three fiscal years, 37 percent (193 accidents) occurred without a load on the hook. Almost all of the accidents were the result of human error. Some of the more common types of accidents include the following:

- Collisions with Objects in the Crane's Travel Path (58 Total). This type of accident accounted for almost one-third of the "no load" accidents. The majority of these accidents were with overhead cranes (37 accidents), followed by portal cranes (12 accidents), and mobile cranes (9 accidents). It is important for operators and crane teams to be alert for any potential obstruction in the crane's path and to be able to safely stop the crane to avoid hitting the object. In congested areas, such as piers and dry docks, clearance zones require constant policing.
- Two-Block Accidents (29 Total). The majority of two-block accidents occurred on mobile cranes. A common cause was bypassing the limit switch when securing the crane and failing to pay close enough attention to the position of the hook block. Telescoping the boom was another common cause of two-blocking accidents. Mobile crane operators must always know the positions of all hook blocks when operating without a load.
- Wire Rope Damage (25 Total). Wire rope damage, including bird caging and jumped sheaves, resulted from lowering mobile crane hook blocks too quickly. Mis-spooling occurred on mobile cranes when hoisting too rapidly with an empty hook. Mis-spooling damage was also found on other types of cranes that were hoisting and rotating and/or traveling too quickly at the same time. Multiple simultaneous operations increase the potential for an accident. Operators must take the time to control the operation and be safe.
- Damage During ODCLs, Set Up, and Securing Operations (32 Total). Numerous other accidents occurred during operator pre-use checks and mobile crane set up and securing operations, including inadvertently lowering the hooks to the ground, damaging ancillary equipment, hitting obstructions while setting up mobile cranes, and overloading hook tie downs. Operators must pay attention to hook block locations, especially on cranes with multiple hooks, when doing pre-use checks. Crane teams must follow the correct procedures when setting up mobile cranes and must not rush when securing them at the end of the shift.

Every accident diminishes support to the fleet. A safe and reliable Navy weight handling program is essential for fleet readiness. I ask that everyone in the Navy shore weight handling community intensify their focus on safe crane operations, with a strong emphasis on ensuring the same level of attention when operating cranes without a load as when conducting lifting operations.

PENDANT CONTROLLER MECHANICAL INTERLOCKS

Inside This Issue

As documented in a past Crane Alteration Request, a naval activity discovered a pendant controller that permitted the simultaneous engagement of both hoist directional pushbuttons. Because mechanical interlocks were not installed in the pendant, the user, who was operating the hoist drive in the lowering direction in first speed (first detent on the pushbutton), was able to obtain the second speed in the lowering direction by pressing the up pushbutton to its second detent while simultaneously maintaining the lower pushbutton in first detent at the pendant. Upon review, it was discovered that the circuitry for both directions of operation share a common second speed circuit. The activity also reported that the bridge and trolley functions of the crane had the same operational characteristics. The activity eliminated this undesirable operational characteristic by installing mechanical interlocks on the pendant controller to prevent the physical depression of both directional pushbuttons simultaneously.

When a crane is discovered with this operational characteristic, mechanical interlocks should be installed on the pendant controller to prevent potential safety hazards. If mechanical interlocks cannot be installed on the pendant controller, then an electrical or mechanical interlock should be installed to prevent shared speed relays from energizing simultaneously.

ELECTRICAL FIRES AND ELECTRICAL SAFETY

Two incidents involving electrical short circuits were recently reported. One activity reported an engine compartment fire on a mobile crane due to an electrical short. A battery conductor was routed over a sharp object where continuous contact eventually wore down the conductor insulation exposing bare wires causing the short and igniting a fire. The fire spread to other nearby conductors before it was extinguished. Since fires can spread quickly, it is imperative that personnel are familiar with the location of fire extinguishers, the proper use of the extinguisher, and the procedure for reporting a fire. Personnel must also ensure that fire extinguishers are in place, seals are unbroken, and inspection tags are up to date.

Another activity reported that a maintenance person was shocked while performing electrical work. The cause of the shock was voltage back feeding through the circuit from a shorted wire that was not properly secured. Electrical shocks are preventable by following standard electrical safety practices. OSHA 1910.147(d)(6), *Control of Hazardous Energy (Lockout/Tagout)*, states, "Prior to starting work on machines or equipment that have been locked out or tagged out, the authorized employee shall verify that isolation and deenergization of the machine or equipment have been accomplished." The person shocked at the activity failed to follow this procedure. Fortunately these incidents did not cause significant equipment damage or personnel injury

Routine maintenance inspections of electrical wiring should include inspecting conductors for proper routing and conditions of insulation, and should ensure that conductors are adequately protected and secured. Conductors that have the potential to be damaged due to contact with sharp edges or objects should be rerouted or the conductor properly protected and secured. Individuals must remain alert and aware that hidden "conditions" may result in equipment damage or personal injury.

HAVE YOU HEARD ABOUT?

A subtle modification of the standard 60-degree screw thread - introduction of a 30-degree (from thread axis) ramp at the major diameter of the internal thread - yields significant improvements to the quality of the fastener joint. Figure 1 depicts the contact patterns of a fastener in a standard 60-degree and modified internal thread. As can be seen, fastener contact with the modified thread is in the form of a spiral line defined by the fastener thread crest and the ramp - rather than area contact of flanks with the standard threads. The effect of the ramp is two-fold - resistance to loosening and more uniform thread load distribution than is obtained with standard threads. Figure 2 provides a representative comparison between the thread load distribution of the two types of threads.

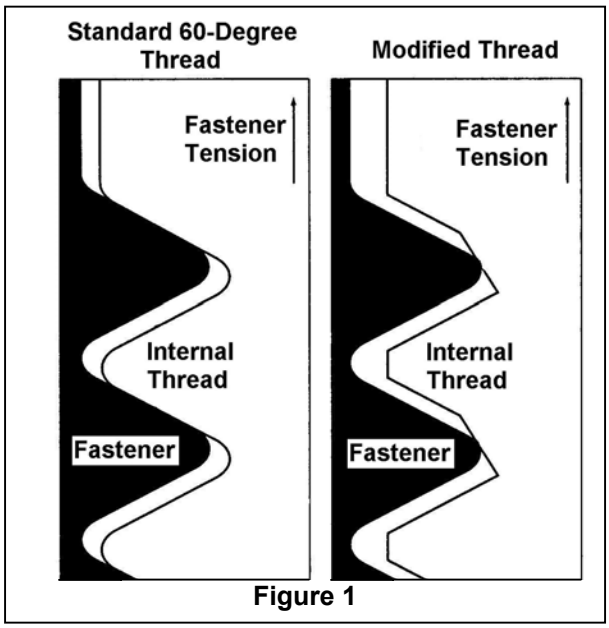

Figure 1

Fastener resistance to loosening is due to its positive centering in the mating thread (centering eliminates the transverse vibrations that are the primary cause of loosening) and wedge locking of the fastener thread crest with the ramp.

The improved thread load distribution is the result of elastic deflections (fastener thread bending as a tapered beam and in the case of a nut - radial expansion). Additionally, the more uniform thread load distribution reduces the potential for fastener fatigue.

Comparative test results obtained with a standard 7/16 - 14 UNC fastener, 5000-pound load, and 0.2 coefficient of friction are graphed in figure 2 and expanded below:

Maximum Stress	Standard 60-Degree Thread	Modified Thread
Tensile	54,300 psi	42,600 psi
Compressive	84,200 psi	89,900 psi
Shear	25,900 psi	13,600 psi
Moment to Cause Relative Rotation	**8.9 lb-ft**	**31.8 lb-ft**

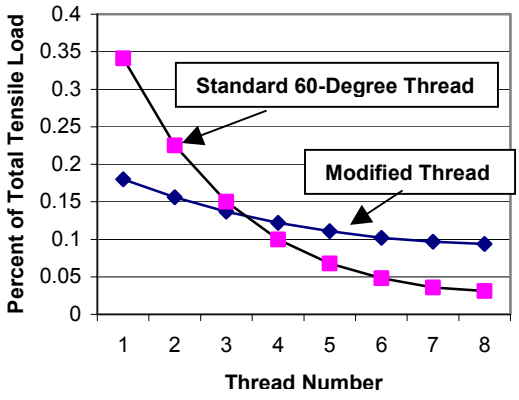

Figure 2

Fastener installation in the modified thread requires initial preload locking torque 20 percent higher than for standard threads. The loosening torque, after a period of severe vibration, is about 120 percent of the initial preload torque. The joint can be disassembled/reassembled more than 50 times without any appreciable loss in performance. Actual life of either component is affected by material hardness, surface roughness, coefficient of friction, and tightening torque.

The manufacturer offers nuts, taps, and spiral inserts (for soft materials) with the modified thread. The modified thread has been used in many critical applications, including those subject to high levels of vibration. More than 700 modified fastener joints are used on each main engine of the Space Shuttle. Some of the other successful applications include diesel engine turbochargers, motorcycle engine/drive assemblies, artificial knee joints, and seismic guns for offshore oil exploration.

SHARE YOUR SUCCESS

We are always in need of articles from the field. Please share your sea stories with our editor m_lstr_ncc_ccorn@navy.mil.

CRANE SAFETY FOR THE FALL

The change of seasons is a good time to remind all weight handling personnel of the importance of safe crane operations. The potential for an accident occurs every time a crane is operated whether lifting a load or operating with no load on the hook.

Historically, October has been the worst month for Navy weight handling equipment (WHE) accidents. In the last six years, there were a total of 134 WHE accidents during the October months. Almost all of them were attributable to human error and, therefore, were preventable.

A significant percentage of these accidents occurred with no load on the hook. One reason is the "rush to go home" syndrome. The following is an excerpt from the report of a recent accident that involved securing a portal crane at the end of the day. "After completion of work, during shutdown operations, the operator was simultaneously swinging to his right, hoisting up with the main and whip hoists, traveling to the land side, and booming down, all at the maximum speed for that configuration. The main hoist back up limit switch was actuated during this operation causing all functions to stop and inducing a swing in the whip hoist block of two meters in each direction. The operator quickly reset the crane and commenced hoisting at maximum speed until the whip hoist wire rope jumped out of the sheave." The estimated cost to repair the resulting damage was $40,000. This is just one example. In fact, WHE accidents without loads on the hook have occurred with most types and categories of cranes, from a half-ton jib crane to a 400-ton capacity hammerhead crane.

With the coming of autumn, all weight handling managers must intensify emphasis on crane operation safety. Crane operations require the same degree of attentiveness and commitment to safe operation when there is no load on the hook as when the crane is lifting a load.

CONTRACTOR CRANE SAFETY AT NAVY SHORE ACTIVITIES

Recently, a contractor's mobile crane overturned while being used to lift scaffolding onto a Navy ship. The ship was not struck but there was some damage to other Navy property as well as considerable damage to the crane and scaffolding. Fortunately, no one was injured. The crane operator grossly underestimated the weight of the scaffolding. An initial attempt by the contractor to upright the crane failed when a sling parted and the crane fell back to its overturned position.

Mobile Crane Stability (next article) reports another recent instance of an overturned contractor mobile crane. The June 2004 Crane Corner also noted additional serious contractor mobile crane accidents. This information provides important safety reminders regarding mobile crane operations and information on training resources available to all Navy shore activities.

Contractor crane accidents on Navy property continue to be a significant problem. Most of the serious crane accidents at our shore activities are with contractor owned and operated cranes. With their proximity to Navy personnel, ships, and other critical assets, crane operations must be effectively monitored. NAVFAC P-307, section 1.7, includes requirements for both the contracting officer and the host activity. Contracting officers are required to provide oversight of contractor crane operations and oversight of contractor accident investigations and corrective actions. Host activities are required to concur with the contracting officer's oversight plans and ensure they are being performed. Appropriate government oversight and critical questioning (e.g., verification of load weight, condition of slings, condition of safety devices) are required. Where local Navy weight handling expertise is available (e.g., shipyards and other large Navy shore activities), utilization of this resource to monitor contractor crane operations has proven effective.

Commanding officers of Navy shore activities are requested to intensify their focus on contractor crane operations safety. The Navy Crane Center is available to teach basic mobile crane operational safety concepts and hazard awareness training.

MOBILE CRANE STABILITY

A Navy mobile crane recently lost stability and overturned during a routine maintenance evolution. Fortunately, there were no injuries but there was considerable damage to Navy property and extended loss of a vital lifting asset. With the boom at a high angle and with the outriggers retracted, the crane was rotated to facilitate the maintenance. The crane lost backward stability and tipped over on the counterweight.

In February of this year, a similar accident occurred with a contractor crane on Navy property. In that accident, the outriggers were also retracted but the boom was at a low angle. When this crane was rotated, the crane lost forward stability and the crane tipped over on its boom.

Mobile cranes are complex machines with many unique operating characteristics. Extended booms provide greater reach but decrease the margin of forward stability. Heavy counterweights provide greater lifting capacity but decrease the margin of backward stability. A large percentage of overturned crane accidents reported to the Navy Crane Center were the result of loss of stability resulting from the rotation of the crane, either intentionally or inadvertently, while the outriggers were retracted and with no load on the hook.

Crane operator supervisors must ensure they and their operators are thoroughly familiar with each mobile crane's operating characteristics. Operating characteristics vary from crane to crane and the list of precautions can be extensive. If an operator is assigned to a crane he/she has not operated recently, the supervisor should review the crane's operating requirements and precautions with the operator. Operators must instinctively know when to deploy the crane's outriggers. When traveling the crane, even short distances, the rotate lock must be engaged. If a problem arises, the supervisor should be contacted. Operator attentiveness is required even for minor movements of these cranes. Other personnel on the crane team, including riggers, inspectors, test directors, and maintenance personnel, should be alert to potential problems.

Weight handling managers are requested to share this information with personnel involved in the operation, maintenance, inspection, and testing of mobile cranes.

LEAD TEST WEIGHTS SAVE MONEY

Lead test weights have proven to be the most efficient and safe type of weights to accomplish load testing of weight handling equipment. NAVFAC P-307 requires that the indicated weight on test weights be within +/-2 percent of the actual weight. Since 1996, Public Works Center (PWC) San Diego has manufactured and provided lead test weights to numerous activities in support of their weight handling equipment program. Test weights of uniform size and weight provide the maximum efficiency and safety when performing certification testing. They are the recommended type of weights for testing weight handling equipment by the Navy Crane Center. PWC San Diego utilizes surplus lead from various Government sources, thereby reducing the cost associated with manufacturing. Activities may specify the size and weight that will provide the most flexibility in testing weight handling equipment in their inventory. Test weights are available in the following sizes and for the price listed below which includes cost of lead, lifting eyes, and shaping and melting the nuggets. Shipping costs are not included.

Weight	Size	Price
20,000 lbs.	77” x 29”x 27”	$8,000.00
10,000 lbs.	36” x 28”x 27”	$4,000.00
5,000 lbs.	23” x 23”x 23”	$2,000.00
4,000 lbs.	21” x 21”x 21”	$1,600.00
3,000 lbs.	19” x 19”x 19”	$1,200.00
2,000 lbs.	17” x 17”x 17”	$ 800.00
1,000 lbs.	14” x 14”x 14”	$ 400.00
500 lbs.	7” x 14”x 14”	$ 200.00
250 lbs.	3” x 14”x 14”	$ 100.00

PHOTOLUMINESCENCE SHINES THROUGH

When last August's massive blackout darkened the hallways of the United Nations headquarters in Manhattan, a photoluminescent egress marking system helped thousands of workers and diplomats safely evacuate the building. The Department of Defense used photoluminescent markings inside the portion of the Pentagon it rebuilt after 9/11.

Photoluminescent products are also well suited for applications where the lights can go out suddenly and completely such as on walkways on an overhead electric traveling crane, or in the interior gantry tube of a portal crane where personnel may be working.

Photoluminescent products use either of two materials, zinc sulfide (ZnS) phosphors or strontium aluminate (SrAl) phosphors, which have the ability to accumulate energy from ambient light and generate an afterglow. Like a naturally occurring battery, they store energy and are able to give it off as light. Strontium aluminate products can hold ten times more energy and have a useful life that is three to four times longer than zinc sulfide. While a zinc sulfide product is visible for 1 1/2 to 3 hours, a strontium aluminate product's typical visibility is significantly brighter and lasts up to 8 hours.

Strontium aluminate is estimated to remain viable for 25 or more years, while zinc sulfide yellows over time and needs to be replaced every 3-4 years. Strontium aluminate powder can be used in oil-based paint mediums and is brightest when applied as a “powder coat” (i.e., electro-static coated at the factory), or incorporated right into sheet form with various thicknesses, strips, moldings, adhesive tape, custom signage, and slip-resistant handrail coverings.

Photoluminescent products offer lower lifetime costs and operational advantages, but they are only part of a sound evacuation signage program that also includes electrical signage.

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.

CRANE SAFETY ADVISORIES

CSA-133: Radiographic Inspection of Welded Master Links, Welded Master Link Assemblies, Welded Rings.
CSA-134: Product Safety and Recall Notification for Coffing Electric Chain Hoists Manufactured February through May 2004.
CSA-135: Potential Damage to Rotating Boom Connection from Rotational Stops on Gorbel Wall Mounted Jib Cranes.

EQUIPMENT DEFICIENCY MEMORANDA

EDM-067: Failure of Gould Shawmut A13X Rectifier Type Fuse.
EDM-068: Eliminating or Minimizing Severity of Overloads on Cranes with Programmable Parameter Controls.

THIRD QUARTER FY04 ACCIDENT REPORT

The Navy Crane Center disseminates crane accident lessons learned to prevent repeat accidents and improve overall crane safety. NAVFAC P-307 requires commands to submit to the Navy Crane Center a final, complete accident report (including corrective/preventive actions) within 30 days of an accident involving Navy-owned weight handling equipment, regardless of severity or type. This reporting requirement includes rigging gear accidents, i.e., gear covered by section 14 of NAVFAC P-307 used by itself in a weight handling operation. In addition, contracting officers are required to forward to the Navy Crane Center and the host activity reports of all contractor caused accidents including contractor caused accidents with Navy-owned cranes.

For the third quarter of FY04, 50 Navy and 7 contractor weight handling equipment accidents were reported. Serious Navy accidents this quarter included two dropped loads, one overload, one two-blocking, one overturned crane, and one other accident.

DROPPED LOADS

Accident: While testing the main hoist brake in the free-fall mode on a mobile crane, the load test director instructed the operator to slowly lower the test load. The operator slowly released the brake to lower the load, but the test load began to fall faster than expected. The operator immediately re-applied the brake, but the load continued to fall until it hit the ground. This caused a shock load to the boom, swinging the auxiliary hoist headache ball back into the boom, damaging some boom lattices. An investigation revealed that the brake was not adjusted in accordance with the original equipment manufacturer's (OEM) specifications.
Lessons Learned: Proper brake adjustments are critical for mobile cranes that have main or auxiliary hoist free-fall capability. Mechanics must understand and follow OEM brake adjustment specifications. Inspectors must verify brakes are properly adjusted.

Accident: The front end of a forklift was dropped from a category 3 bridge crane when a 3/8-inch by 3-foot long wire rope sling supporting the load was overloaded and parted. The crane was being utilized to lift the front end of a forklift so blocking could be placed under the front wheels. While preparing for the lift, the crane operator incorrectly read the wheel loading on the forklift data plate, 4,180 pounds per side, as the weight of the front of the forklift. (The actual weight lifted was approximately 8,300 pounds.) The operator selected the only readily available sling, which had a capacity of 2,869 pounds. The operator used the sling in a basket hitch configuration, believing this would double the capacity to 5,738 pounds. The sling was placed around a component that was rectangular in cross section with sharp edges, without sufficient chafing protection. When the forklift was hoisted approximately 6 to 12 inches, the sling parted and dropped the forklift.
Lessons Learned: Operators shall know, or have a reasonable estimate of the weight to be lifted. Management must ensure that only properly trained and knowledgeable personnel are allowed to rig loads. In a basket hitch configuration, a sling's capacity doubles only if the body of the sling is bent around an object that is greater than 40 times the diameter of the wire rope. As stated in Change 3 to NAVFAC P-307, for loads with non-circular cross-sections, "D" shall be derived from the minimum bend diameter of the wire rope around the corner of the load.

OVERLOAD

Accident: A crane team was assigned to assist a sail team with the raising and lowering of a snorkel hydraulic cylinder piston for the purpose of venting the cylinder and flushing hydraulic fluid from the system. The approved plan to cycle the piston was to use a two-ton chainfall suspended from a portal crane's auxiliary hook to raise and lower the piston. In lieu of using the crane's hoist function, the chainfall was prescribed as a safety precaution. After a few evolutions, when no resistance was met raising the piston, the rigger-in-charge decided to deviate from the procedure and cycle the piston by using the crane's hoist and not the chainfall without approval from the supervisor. After the piston reached the upper end of the stroke during the third cycle, the lead rigger signaled the operator to stop hoisting. He was about to give the signal to lower the hoist when he heard an unusual noise coming from the rigging gear. The crane operator believing he had been given a hand

signal from the rigger to hoist up, engaged the hoist, raising the piston into the "hard stop" causing an overload, which parted the load chain on the chainfall.
Lessons Learned: Deviation from approved procedures must be approved using the appropriate chain of command, prior to implementation. Additionally, riggers must ensure hand signals are clearly given. If the operator is in doubt, he/she should not proceed until the signal is clearly understood.

TWO-BLOCKING

Accident: A mobile crane main hoist was two-blocked while undergoing an annual maintenance inspection. The lead mechanic/operator started the crane and began telescoping the boom out. As the boom was extending, the operator turned his attention away from the boom movement to look for the assisting mechanic. At that time, the hook block contacted the boom, damaging pin retainer plates. The crane had not been shifted from the "rigging/travel" mode, which deactivates the limit switch. The assisting mechanic was answering a phone call and was not at his assigned station.
Lessons Learned: Crane operators and team members must remain alert and focused during all types of crane operations. Whenever mobile crane safety devices are by-passed for traveling or reconfiguring the crane, the operator must ensure the safety devices are properly reset prior to commencing operations. If the operator has a concern that will divert his attention, he must stop operations.

OTHER SIGNIFICANT ACCIDENT

Accident: An operator was assigned to lower personnel in a platform over the side of a ship so they could remove safety netting frames. The operator set the crane up on the pier approximately 18 inches from the sea wall. After setting the crane up on outriggers, the operator performed a trial lift and then allowed the personnel to enter the platform. After six of the frames had been removed, the operator rotated the crane to position for removal of the seventh frame. As the crane rotated, the concrete slab under the left front outrigger gave way and the crane dropped onto its left front tire. This movement of the crane caused the personnel platform to swing in an uncontrolled motion away from the ship, the operator immediately took action to prevent the personnel platform from swinging back into the ship. The operator then moved the platform to a safe position to allow personnel to exit.
Lessons Learned: Adequate ground support for mobile crane operations is essential. NAVFAC P-307, section 10, requires that the activity facilities engineering organization identify limitations and restrictions for operating mobile cranes on piers, wharves, or other structures. The crane team must understand allowable mobile crane set up locations.

SIGNIFICANT CONTRACTOR ACCIDENTS

Accident: While a rigger was preparing a mobile crane for hoisting aboard a ship, an outrigger pad fell off. The rigger decided to tie it to the outrigger beam so it could be hoisted with the crane. At the same time, the operator began retracting the outrigger. The operator was unaware of the rigger's location and the rigger failed to stop the operator or move away from the retracting outrigger, resulting in both of his index fingers being crushed between the outrigger beam and housing.
Lessons Learned: Riggers should always be aware of potential pinch points and must advise the operator when it is necessary to stop operations. In addition, operators must be aware of the surroundings when performing any crane movement.

Accident: Two laborers were re-spooling the hoist wire rope on a telescoping boom crane. One laborer, although not listed as an operator on the certificate of compliance, as required by NAVFAC P-307, was operating the crane, and the other laborer was tapping the wire rope with a hammer to ensure it layed properly on the drum. The area he was standing on was small and difficult to maintain balance, so he steadied himself with his left hand by holding onto a view port opening located on the boom. At that time, the laborer operating the crane informed the second laborer that he was going to retract the hydraulic boom. As the boom was

retracted, it pulled the second laborer's hand into the view port severing his left hand and crushing a portion of his arm.

Lessons Learned: Management must ensure that only qualified personnel are authorized to operate and work on cranes. Crane team members should always pay strict attention to moving parts and be mindful of those moving parts that may create a potential pinch point. Crane team members should always practice operational risk management and stop any operation that may endanger themselves or others.

Weight handling program managers and safety officials are encouraged to consider the potential risk of accidents occurring at your activity similar to those highlighted above and apply the lessons learned to prevent similar accidents. OPNAVINST 3500.39, *Operational Risk Management*, prescribes methods for assessing hazardous operations, which should be used in the planning and preparation of all WHE lifts.

E-mail submission (m_lstr_ncc_safe@navy.mil) of reports of accidents, unplanned occurrences, and near misses is encouraged. The reports must include a complete and concise situation description, corrective and preventive actions, probable cause and contributing factors, and an assessment of damage. For equipment malfunction or failure, include specific description of the component and the resulting effect or problem caused by malfunction or failure.

P-307 QUESTION & INTERPRETATION

The question and interpretation listed below is based on crane program issues that arose and a Request for Clarification, Deviation, or Revision, P-307, figure 1-1. They are also listed on our web page, http://ncc.navfac.navy.mil/. Click on P-307 and then on P-307 Questions and Interpretations. The issues are arranged by the applicable section or appendix to the P-307.

Question: Navy Crane License. What is required for a naval reservist who possesses a current National Commission for Certification of Crane Operators (NCCCO) certificate to obtain a Navy crane operator's license? Is he required to attend the General Crane Safety course? What documentation is required to establish a crane license record?

Answer: Naval reservists who posses a current NCCCO certificate may be issued a Navy crane operator's license at the discretion of the designated licensing official for the types of cranes for which the candidate holds a certificate. The operator license candidate must:

- Submit an application for a crane operator's license.
- Submit a copy of DOT physical examination record (within the last two years).
- Submit a copy of the current NCCCO certificates for the cranes to be operated.
- Successfully complete the General Crane Safety Refresher (Cat 1 & 4) course.
- Successfully complete the performance test on each type of crane for which he/she is requesting a license.

(These items shall be retained on file as the crane operator's license file.)

A crane operator's license can then be issue for a period not to exceed two years.

NAVY CRANE CENTER

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NCC VIDEOS

Accident Prevention

Seven crane accident prevention lessons learned videos assist activities in raising the level of safety awareness among their personnel involved in weight handling operations. The target audience for these videos is 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.
Request these videos by e-mailing m_lstr_ncc_ccorn@navy.mil.

Weight Handling Program for Commanding Officers

"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.
The video is available at http://dodimagery.afis.osd.mil/ (DAVIS/DITIS) (PIN 806467).

Mobile Crane Load Test

"Load Testing Mobile Cranes at Naval Shore Activities" provides load test personnel guidance on properly testing mobile cranes per NAVFAC P-307.
The video is available at http://dodimagery.afis.osd.mil/ (DAVIS/DITIS) (PIN 806634).

Mobile Crane Safety

"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.
The video is available at http://dodimagery.afis.osd.mil/ (DAVIS/DITIS) (PIN 806721).