THE CRANE CORNER

Navy Crane Center Technical Bulletin

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A WORD FROM TOPSIDE

Sam Bevins

I sincerely appreciate your keeping a strong focus on weight handling operations safety as we all drive toward our mutual goal of Zero accidents. In my last Word from Topside, I noted - with great pleasure - the opportunity to significantly beat the Fiscal Year 2010 record for the fewest Navy crane accidents. At the time of that writing, Navy activities had reported 11 percent fewer crane accidents than for the same time period last year. However, there was an uptick in this trend during the second quarter of this fiscal year. Through May of this year, Navy shore activities are now running ahead of the same time period last year by 11 percent.

More disturbing is the increase in number of significant accidents for this time period. We classify injuries, two-blocks, dropped loads, and overloads as significant accidents. Although many of these are not serious (while some events that do not fall within these four categories can turn out to be serious), they are all too common and always have the potential to have serious consequences. At the end of May, the count of significant accidents (36) is 80 percent higher than at this time last year.

Looking at trends, rigging overloads account for 12 of the 36 significant accidents, as compared to 2 rigging overloads for the same time period last year. The two main causes are: not knowing the weight of the load to be lifted initially; and overloads resulting from lifting bound or constrained loads. Portable load indicating devices (LIDs) are relatively inexpensive and are a convenient way of verifying weights of items to be lifted and forces placed on the crane and rigging gear due to bound loads. I strongly encourage their use. As would be expected, the increased use of portable LIDs has enabled crane teams to become more aware of overloads. Overloads had undoubtedly been occurring in the past, particularly with constrained loads, but were going unnoticed. So, some of the uptick in overloads can be attributed to increased awareness of overloads. With increased proficiency in the use of portable LIDs, combined with close monitoring and pre-established stop points, overloads of both the crane and the rigging should eventually be greatly reduced. In addition, please review our Weight Handling Safety Brief (WHSB) 11-S-04, which addresses rigging gear selection and use (see page 14). All of our WHSBs can be found on the Navy Crane Center website: https://portal.navfac.navy.mil/NCC.

Two-blockings are the second most frequent significant accident type. For category 3 cranes, a contributing factor to the two-blockings was improper winding of the wire rope on the drum due to side loading. Many small hoists have only a single upper limit switch that counts rotations of the drum, but with mis-reeved rope due to side loading, the limit switch is ineffective. Always lift loads vertically, never drag loads, and never rely on a limit switch to stop the movement on the hoist block. Shop personnel should be encouraged to view our category 3 crane safety video, Safe Rigging and Operation of Category 3 cranes. This video addresses common hazards associated with these small cranes as well as safe operating practices. All Navy Crane Center safety videos are available on our website. One final note on

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two-block accidents, half of the two-blockings that occurred this year were not reported immediately but were discovered at a later time. This is a sign of an activity program that lacks maturity.

On a positive note, rigging (non-crane) accidents through May are down 25 percent from last year, and despite a poor first quarter, contractor crane accidents through May are 30 percent lower than last year.

On a very positive note, reports of near misses and other unplanned events that do not meet our broad definition of a crane or rigging accident are 177 percent higher than last year. Recognizing, investigating, and reporting those events that are not classified as accidents, yet can yield significant lessons learned, is a sign of a healthy, safety-conscious, and ultimately more efficient weight-handling program. Self-identification of problems, issues, and trends before they result in accidents is our mutual goal.

The crane accident definition contained in Section 12 of NAVFAC P-307 has what has been termed "a wide aperture." The definition as provided in paragraph 12.2 has a far reaching scope. This is intentional! The scope of the accident definition, and subsequent required investigation and reporting provides the activity, as well as the Navy (through the Navy Crane Center), information that can be used to gain an understanding of the issues that are occurring in the field, thereby allowing information to be provided to commands that can be used to preclude similar events from recurring. With that said, one can gauge the reporting criteria and develop an awareness of the issues at the specific activities. One such indicator is the total number of accidents (by NAVFAC P-307 definition) reported as compared to those that are considered significant. Based again on the "wide aperture" definition, you should expect to see more accidents reported in the range of non-significant than those that are considered significant. The delta between significant as compared to non-significant accidents may indicate if there are additional events (which meet the definition threshold) that are being missed. It should be recognized that these "missed opportunities" can be very helpful to potentially prevent more serious events from occurring. Reporting events that are less serious in nature (lessons learned) is viewed as a level of maturity, which is healthy with respect to ensuring continuous program improvement.

There is still time to reverse the negative trend in crane accidents. The summer months are still ahead of us and accident-free operations will be a constant challenge. But with the increased awareness by all that recognizing and resolving potential hazards before they become accidents is a good thing, this year can still be our safest crane accident year on record. As we know, a safe and effective weight handling program is an essential enabler for Fleet Readiness.

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)

CSA 197A, Hook Block Chain Pin Failure on Harrington 1-Ton Manual Chain Hoists

Background:
A. This CSA supersedes Crane Safety Advisory (CSA) 197. CSA 197 detailed a chain pin failure of a Harrington Model CF 1-Ton manual chain hoist. The activity was unable to locate the failed chain pin. The

activity tested chain pins from six similar hoists for hardness with one pin found outside of the OEM specification to have a hardness of 49HRC. Consequently, CSA 197 directed activities to immediately remove Harrington Model CF and Model CB 1-Ton hoists from service and further directed activities to perform NDT, material analysis, and hardness verifications on chain pins from a 15 percent sample of affected hoists.

B. The chain pin found with 49HRC hardness was sent to the OEM for further evaluation. The OEM performed hardness checks on the returned chain pin and found that the surface condition of the chain pin where the activity performed hardness checks may have affected the results. The OEM re-performed the hardness check and found the chain pin to be within specification. Additionally, information supplied from the OEM indicates that the chain pins are designed with a design factor in excess of ASME B30.16 requirements.

C. Navy Crane Center has received results from activities that have completed the 15 percent sample testing directed in CSA 197. The results so far have indicated no material defects with the chain pins. In addition, the OEM has stated that company quality assurance controls require chain pin material and hardness certifications from the vendor.

Direction:
A. Without disassembly, activities are to visually inspect the lower block of all Harrington Model CF and Model CB 1-Ton manual chain hoists (following OEM inspection guidelines) for any signs of damage or deterioration, excessive wear, and loose or missing fasteners. Verify chain pins are marked with the letter 'K' on the head of the pin as supplied by the OEM. Any questionable conditions will require disassembly of the lower block for further inspection. Where removal of the chain pin was required, inspect the pin and pin hole for dimensional conformance in accordance with OEM instructions.

B. Hoists where visual inspections were satisfactory and where the lower block was not disassembled may be returned to service. Hoists where the lower blocks were disassembled or chain pins were removed for inspection will require a load test in accordance with NAVFAC P-307 prior to returning the hoist to service.

C. Prior to or during the next annual inspection, activities shall disassemble the lower blocks on all Harrington Model CF and Model CB 1-Ton manual chain hoists for a thorough inspection. The OEM operation and maintenance manual shall be used for inspection requirements and removal criteria. Additional disassembly of the hoist for inspection may be required if not previously performed within six annual inspections (see P-307, paragraph 14.10). Report any unsatisfactory conditions found with lower block components to Navy Crane Center.

<u>CSA 198, Failure of Standard Manufacturing Co. Pipe Elevators</u>

Background:
A. An activity reported the failure of two Standard Manufacturing Co. pipe elevators during load testing of size 4 and size 5 pipe elevators, (see Pipe Elevator Specification Sheet). The load ratings marked on the OEM tags were 84,000 lbs and 78,000 lbs respectively. The pipe elevators were each being tested to 125 percent of an administrative down rating of 50,000 lbs. The size 4 elevator failed in yield and the size 5 elevator failed in fracture at a test load of 62,753 lbs.

B. Based on available OEM data, the load ratings for the pipe elevators do not appear to satisfy ASME B30.20 or ASME BTH-1 design factor requirements. Navy Crane Center has been unsuccessful in obtaining any additional information from the OEM.

Direction:

A. Activities shall immediately remove all Standard Manufacturing Co. pipe elevators from service. If additional information is received from the OEM demonstrating that these devices do meet ASME B-30.20 and ASME BTH-1 requirements, further direction will be provided in a revision to this CSA.

STANDARD MANUFACTURING CO.

[Home] [Pictures] [Specifications] [Safety] [Pricing] [Contact Us]

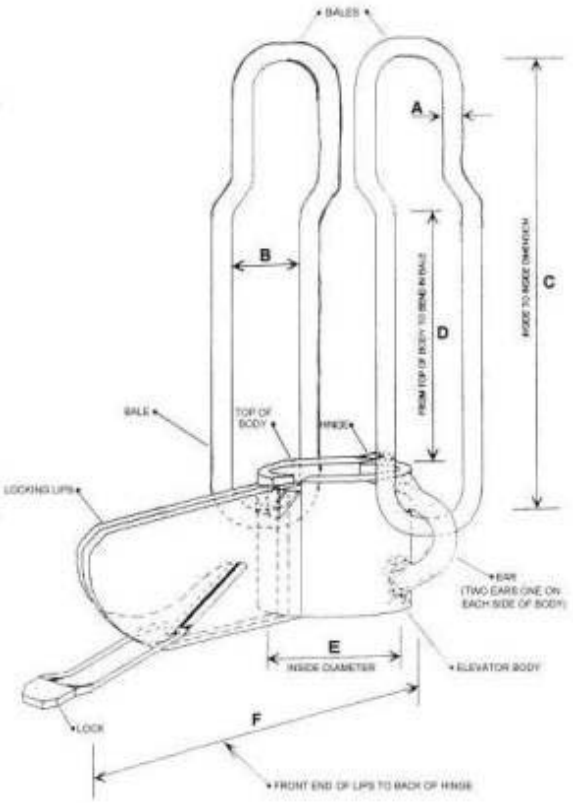
Pipe Elevator Specifications

Dimensions

	Dimension (INCHES)					
Sizes	A	B	C	D	E	F
1	5/8	3	12 3/4	7	1 7/16	7 1/2
1 1/4	5/8	3	12 3/4	7	1 3/4	8
1 1/2	5/8	3	12 3/4	7	2	8 1/4
2	5/8	3	12 3/4	7	2 1/2	8 1/4
2 1/2	3/4	3	12 1/4	6 1/2	3	9 1/2
3	3/4	3	12 1/4	6 1/2	3 5/8	11
3 1/2	3/4	3	12 1/4	6 1/2	4 1/8	11 5/8
4	3/4	3	12 1/4	6	4 5/8	12 3/4
4 1/2	3/4	3	12 1/2	6	5 1/8	13
5	3/4	3	12 1/2	6	5 11/16	13 1/2
6	7/8	3	18 1/2	11	6 3/4	14 1/2
8	1 1/4	3	21 1/2	11 1/2	8 3/4	18 1/4
10	1 1/4	3 3/4	21 1/2	11 1/2	10 7/8	21 1/4
12	1 1/4	3 3/4	21 1/2	11 1/2	12 7/8	23 1/2

Custom bales available upon request

Download Dimensions
(PDF - 204 KB)



CSA 198
Attachment 1
Page 1 of 1

EQUIPMENT DEFICIENCY MEMORANDUM (EDM)

EDM 098 Gemco Model 2000 Worm Gear Type Rotary Limit Switches

Background

A. The purpose of this EDM is to inform activities of a Gemco Model 2000 worm gear rotary limit switch manufactured by Ametek that failed to stop the hoist as expected. The activity investigated the limit switch failure and determined that the actuating cam did not make proper contact with the switch.

B. The configuration of the Gemco Model 2000 geared limit switch is such that the upper and lower limit switches are stacked one on top of the other in close proximity to the actuating cams and mounted with two screws. It was determined that if the switches are shifted slightly away from the cams, either by vibration or not initially set correctly, then the switch(es) will not actuate. Two identical (never installed) Gemco Model 2000 geared limit switches were inspected and found to have switches that did not actuate because the switches were shifted slightly away from the cams. Switch actuation is indicated by an audible click.

C. Ametek was contacted and recommends using a thread locking compound to eliminate the possibility of the screws loosening due to vibration and hence allowing the switches to shift away from the cams. Ametek also confirmed that they manufacture Gemco Model 1980 and Model 2006 limit switches that are a more robust design. Navy experience confirms that the Gemco 1980 and 2006 limit switches are more reliable limit switches. The activity replaced the Gemco 2000 with the Gemco 2006 limit switch.

Recommendation

A. Activities are reminded that NAVFAC P-307 Appendix C Item 64, and Appendix D Item 29 require checking limit switches for proper adjustment. If any Gemco Model 2000 switches have shifted relative to the cams, re-position them for proper adjustment. Navy Crane Center recommends after making adjustments to the Gemco Model 2000 limit switches that a thread locking compound be used to secure the mounting screws.

B. Navy Crane Center also recommends that those activities experiencing operational issues with the Gemco Model 2000 limit switches should consider replacing these switches with a more robust and reliable design (e.g., Gemco model 2006, Gemco model 1980, or equivalent limit switch). A crane alteration request for Navy Crane Center approval is required for replacement of limit switches.

CRANE SAFETY AWARENESS FOR THE SUMMER MONTHS

As we approach the summer months, I again ask weight handling managers and supervisors to place a special focus on safe crane and rigging operations. Overall, the number of Navy shore based crane accidents thus far this fiscal year is slightly higher than the totals for the same period last year. However, there has been a sizable increase in accidents that we consider to be significant (dropped loads, overloads, injuries, or two-block) as compared to last year (See Word from Topside). Almost all of the reported crane accidents have been attributed to human error. Historically, the summer months have brought us some real challenges in preventing crane accidents. With the distractions associated with the warmer weather, maintaining a sharp focus on the critical job at hand during weight handling operations will be challenging but we cannot expect anything less. We must strive to maintain focus and ensure that weight handling operations are adequately planned and staffed to perform the task at hand. By intensifying safety awareness in all weight handling operations, we can make this fiscal year another record year for safety in the navy shore weight handling program.

Specific accident prevention emphasis should be given to prevent bound or snagged loads, crane or load collisions and overloaded rigging gear. These accident types account for 55 percent of our total accidents thus far this fiscal year. When lifting potentially constrained loads, crane teams must be able to know immediately when suction or friction forces are greater than planned or when a load is hung up (binding) and is not freely suspended. To avoid collisions, ensure a clear operating envelope and a clear path of travel for the crane and the load. Proper rigging gear selection and determining correct lifting points begins at the job planning stage. In summary, assess the job, understand the potential risks, and then identify and implement mitigation actions before proceeding.

Good planning, teamwork, communication, situational awareness and operational risk management (ORM) are all good tools for use in reducing the risk of an accident. Management should consider and address the impact of the summer vacation season on your crane teams. The team make up is often changing to support vacation schedules. A consequence may be degradation in communications or process unfamiliarity among the team.

Surveillance of crane and rigging operations by experienced personnel has proven to be an effective tool in accident prevention. During surveillances, look for warning signs of complacency or taking shortcuts, and include operations where there is no load on the hook.

Consider a preemptive safety awareness briefing to reinforce management's expectations for adherence to safe lifting and handling requirements and practices. Recognize safe practices and achievements where warranted. As a reminder, there are seven crane accident prevention videos available to assist activities in raising the level of safety awareness among their personnel involved in weight handling operations. These videos provide a very useful mechanism for emphasizing the impact that the human element can have on safe weight handling operations. In addition to these lessons learned safety videos, other videos are available (safe rigging and operation of Category 3 cranes, mobile crane safety, weight handling program for Commanding Officers, and mobile crane load test) to assist commands in crane safety awareness. All can be ordered from or viewed on the Navy Crane Center website https://portal.navfac.navy.mil/ncc .

Ensure all personnel involved in the weight handling program understand our comprehensive crane and rigging gear accident definitions and report all events that meet those definitions. Our philosophy of reporting, and learning lessons from, the small events to help prevent more serious events has shown itself to be effective. Increased safety awareness by all personnel involved in weight handling operations and consistent application of ORM principles will help prevent crane accidents.

Each weight handling accident diminishes support to the fleet. A safe and reliable Navy weight handling program is an essential enabler for fleet readiness. Commanding Officers of Navy shore activities are strongly encouraged to intensify their efforts to raise the level of safety awareness in their weight handling operations and continue to strive for the goal of ZERO weight handling accidents.

SUMMARY OF WEIGHT HANDLING EQUIPMENT ACCIDENTS SECOND QUARTER FY11

For the second quarter of FY11, there were 46 crane accidents (15 significant including 1 OPNAV Reportable Class C); 8 rigging accidents (2 significant); 9 crane accident near misses; and 8 rigging accident near misses. Additionally there were 6 contractor crane accidents (1 significant). Significant accidents are those involving overload, dropped load, two blocking, or personal injury. Some of the more significant accidents and trends are discussed herein.

Over 40 percent of the crane accidents involved collisions of either the crane or load. Eight collisions involved the crane contacting an object within the crane envelope. The remaining 11 involved the load making unplanned contact during the lift. These collisions were varied including hazard barrels, light poles, light switches, and even garden hoses and ladders. None of these incidents involved 'dynamic movement' of an object into the operating envelope while the crane was in operation, but were all stationary objects placed in the crane operating envelope before movement was initiated.

Lessons Learned: The percentage of accidents involving collisions is a substantial increase from previous quarters and suggests that increased awareness of crane operating envelopes is required. The load and crane should be monitored during movement to ensure continuous clearance. Additional personnel should be posted as necessary to monitor motion.

OVERLOADED RIGGING GEAR

Accidents: 40 percent of the significant accidents involved the overloading of rigging gear (See Word from Topside, page 1). A 4-leg bridle sling was overloaded during a load test of a category 1 mobile crane. The test team assumed that the capacity of the sling was sufficient as it had been used in the past. However, the sling was overloaded by nearly 17,000 lbs or 18 percent over the rated capacity. Further investigation of previous load tests indicated the sling had been overloaded on two previous occasions under similar circumstances.

Lessons Learned: In accordance with paragraph 14.4.2 of NAVFAC P-307, pre-use inspection is required to "verify rated load, marking, inspection status, serial number and condition" prior to each use. It should never be assumed that gear is sufficient for use only on the basis that it has been used before.

PERSONAL INJURIES

Accidents: Injuries in FY11 are on an increase. In the second quarter, there were four crane accidents involving injuries. This is double the highest number of injuries for the second quarter of any of the five previous years. The injury count for FY11 has already matched the highest total fiscal year count since FY06. Injuries this quarter included the following: (a) A rigger's finger was pinched while removing a shaft bore plug from a lathe using a bridge crane. (b) A rigger was pinned between a ladle of molten metal and a handrail as he attempted to control the load when the crane operator traveled in lieu of hoisting as requested by the rigger in charge. (c) As a piece was being removed from a machine, the trainee was monitoring the lift but not the attached chainfall that was not being used for this part of the lift. The hook of the chainfall briefly became snagged and then suddenly released striking the trainee in the chest.

The most significant accident and injury this quarter (and this fiscal year) occurred during a set up of a mobile crane. While the operator was lowering the outriggers, the rigger's safety glasses fell from his head and landed on the ground under the outrigger pad as it was lowering. The rigger reached under the pad to retrieve his glasses and his hand was pinned while the outrigger continued to descend.

Lessons Learned: There are times when we simply react. We respond with nearly unconscious thought such as stabilizing a load or unconsciously reaching for safety glasses. Alternatively, as we focus on one portion of a lift, our attention can be taken from other parts. Our goal in the dangerous business of lifting and handling is to continually train, familiarize, and reinforce learned behaviors that are consistent with the dangers of our environment. We must monitor multiple parts of a dynamic lift all at the same time. In addition, safe lifting and handling requires constant communication either through line of sight, radios, spotters or other team

members that vigilantly protect the safety of all team members. Ensure you have adequate personnel to accomplish the weight handling evolution safely.

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 your activity. Contracting officers should share this information with representatives who oversee contractor weight handling operations. This is also a good time to reinforce the principles of operational risk management. Our goal remains Zero weight handling accidents.

COASTAL IPT CRANE CREW TRAVELS TO CHINA LAKE

Because NAVFAC Southwest's 200-ton Link-Belt ATC-3200 crane gets two miles-per-gallon when traveling up grades, the crane crew chose a route that would minimize the number of hills they had to climb with the crane. (U.S. Navy photo)

China Lake, CA. – The NAVFAC Southwest crane operator departed Naval Base San Diego on Coastal IPT's 200-ton Link-Belt ATC-3200 crane January 24 en route to Naval Air Weapons Stations China Lake. With a chase vehicle in tow, driven by a crane supervisor, the crane made the trip in just under eight hours. Coastal IPT usually provides crane service only to bases in the metro San Diego area, but a critical lift was required in China Lake, and the specialty crane normally utilized by a contractor to perform the lift was out of service. The Base Support Vehicles and Equipment (BSV&E) Supervisor was quick to respond, offering the expert services of the Coastal IPT crane crew. Making a scouting trip on January 11, they inspected the lift site for clearances and ground conditions. They also inspected all the rigging gear that was to be used for the lift. Because the total weight of the load and crane was an incredible 358,000 pounds, they required China Lake engineers to check the allowable ground conditions to ensure the site could support the maximum load of 165,000 pounds that the left rear outrigger would be subjected to during the lift. Due to the length of the trip, they also scouted the entire route to ensure the crane could make the trip safely. They chose a route that would minimize the number of hills they had to climb with the crane since it gets only two miles-per-gallon when traveling up grades. NAVFAC's large cranes also cannot simply fit into any local gas station when they get low on fuel. The team needed to determined where the crane would need to refuel, so they scouted truck stop locations where the crane could comfortably fit and return to the highway. Following on the heels of the crane's early morning departure on Jan. 24, an additional three tractor-trailers with 112,000 pounds of crane counterweights, blocks and outrigger support steel pads departed San Diego for the trip to China Lake. By the end of the day, all of the

counterweights were loaded onto the crane and the crew was prepared for the next day's planned lift. The scheduled lift was completed safely as planned, and all of the counterweights were reloaded onto the trailers and hauled back to San Diego. The crane made the long return trip, completing another successful evolution by Coastal IPT's Base Support Vehicle and Equipment team demonstrating their ability to provide world-class transportation and weight handling services across NAVFAC Southwest.

ACQUISITION NEWS

The Navy Crane Center accepted a new 20-ton rated capacity, top running double girder overhead electric traveling, ordnance handling bridge crane on March 17, 2011. The contract acceptance test was used by the activity as the load test for crane certification. The CMAA 70 crane has a 46-foot 8-inch span with 64-foot hook height and features a top running trolley, a main hoist, and a 5-ton rated auxiliary hoist. Features of the crane include infinitely variable speed electronic drives on all functions; a LCD touch screen display providing and saving real-time motor information, drive commands, and faults for all drives; a maintenance walkway on the drive girder; and pendant controls. The project included runway conductors for the 115 foot long runway.

20-Ton OET Crane During Fabrication

The Navy Crane Center accepted an overhauled 100/10-ton rated capacity, double girder overhead electric traveling, ordnance handling bridge crane on April 22, 2011. This crane is the first of two overhauls. The overhaul scope consisted of conversion of the crane from a Ward Leonard DC motor control system to an AC variable frequency drive control system, removal of an onboard motor- generator set, and replacement of motors, brakes, couplings, and the pendant control station. A radio controller was added as an alternate operating means. Additionally, a new load indicating system was installed that allowed for capacity overload protection and display of lifted load on a scoreboard visible from the ground. All work was done on site and took two months to complete. The contract acceptance test was used by the activity as the load test for crane certification.

The Navy Crane Center accepted two new 8-ton rated capacity cargo handling cranes on May 2, 2011. The cranes are the type normally installed for shipboard cargo handling, but were installed at a shore-based activity for training of operators and cargo handling personnel. Each crane features two separate booms with independent slewing capability. The cranes can be operated in a "twinning" mode that allows the booms to be operated from a single controller and rotated on a single slewing base. The cranes have a maximum reach of 26 meters, and are capable of lifting 25-metric tons, but are down rated due to the actual training loads and foundation design. The cranes are electric powered, hydraulic operated. The project included demolition and removal of the existing cranes.

Old Cranes


New Cranes

The Navy Crane Center recently accepted twelve 2-ton rated capacity, pneumatic powered, ordnance handling, chain hoists. Eight of the hoists were installed on patented rail monorails that were part of the acquisition project. The other four hoists replaced existing hoists and were installed by the end user on existing runways. Each hoist features upper and lower hook overtravel limits, a self-locking worm drive in the hoist drive train as a secondary brake, low-spark materials, and a pneumatically powered trolley. The hoists were procured with pressure regulators, moisture separators and oiler. The contract acceptance test was used by the activity as the load test for crane certification.


Pneumatic Chain Hoists Ready for Installation

The Navy Crane Center recently accepted a new 10-ton rated capacity, double girder overhead electric traveling bridge crane. The contract acceptance test was used by the activity as the load test for crane certification. The CMAA 70 crane has a 48-foot 3-3/4-inch span with 21-foot 3-1/4-inch hook height and features a top running trolley, infinitely variable speed electronic drives on all functions, and radio controls. The project included new runway conductors for the runway.

10-Ton OET Crane

POOR QUALITY DIESEL FUEL

Several activities have reported erratic engine performance and accelerated fuel filter clogging as a result of the quality of fuel in the fuel tank. The activities traced the problem to the fuel suppliers. At one activity, the fuel supply truck contained excessive sediment in its tank. Another traced excessive bacteria levels to growth in the terminal storage tank, which provides fuel for several suppliers to the activity.

"Dirty" fuel includes excessive levels of water, sediment, and bacteria colonies as discussed below:

A. Water condenses from the air above the fuel in the tank. The more humid the air and the cooler the tank, the more water condenses and collects at the bottom of the tank. Water is also in solution in the diesel fuel. As the fuel cools, it loses its ability to keep water in solution. Most diesel fuel systems have a water separator to ensure the water does not reach the engine. Water in the fuel tank may be minimized by keeping the tank full, filling the tank in the morning, having a desiccant filter on any air vents, and by regularly draining some liquid from the bottom of the tank. This liquid will usually contain a mix of water, fuel, and sediment.

B. Sediment is the result of natural decomposition of diesel fuel over time. It is denser than the fuel and collects at the bottom of the tank. Fuel filters and strainers prevent sediment from reaching the engine. Sediment levels may be minimized by maintaining fresh fuel in the tank and regularly draining some liquid from the bottom of the tank.

C. Bacteria are an unavoidable presence in diesel fuel. They exist at the fuel-water interface and can grow into large colonies. The colonies are often drawn into the fuel lines. Heavy infestations can constrict fuel flow to the engine by clogging filters, fittings and injectors. Bacterial growth may be controlled by minimizing water levels in the tank, maintaining fresh fuel, adding biocides, and periodically cleaning the tank to remove bacteria from the sides of the tank. Biocides may result in a short-term increase in filter replacement rates until the dead colonies are removed from the tank.

NAVFAC P-307 provides inspection attributes for the fuel system such as checking fuel lines, inspecting fuel filters and strainers, checking fuel pressure, etc. Performance problems with your diesel engine can also be the result of poor fuel quality. If fuel quality is suspected as the cause, then a fuel sample should be collected and tested. Test kits are commercially available or samples may be sent to commercial labs.

PORTABLE FALL ARREST SYSTEM

Servicing mobile cranes in the field in compliance with OSHA fall protection requirements can be a real challenge. There are products on the market that accommodate most job requirements. A portable fall arrest system can get the job done safely. Some can be maneuvered and set-up by only one worker.

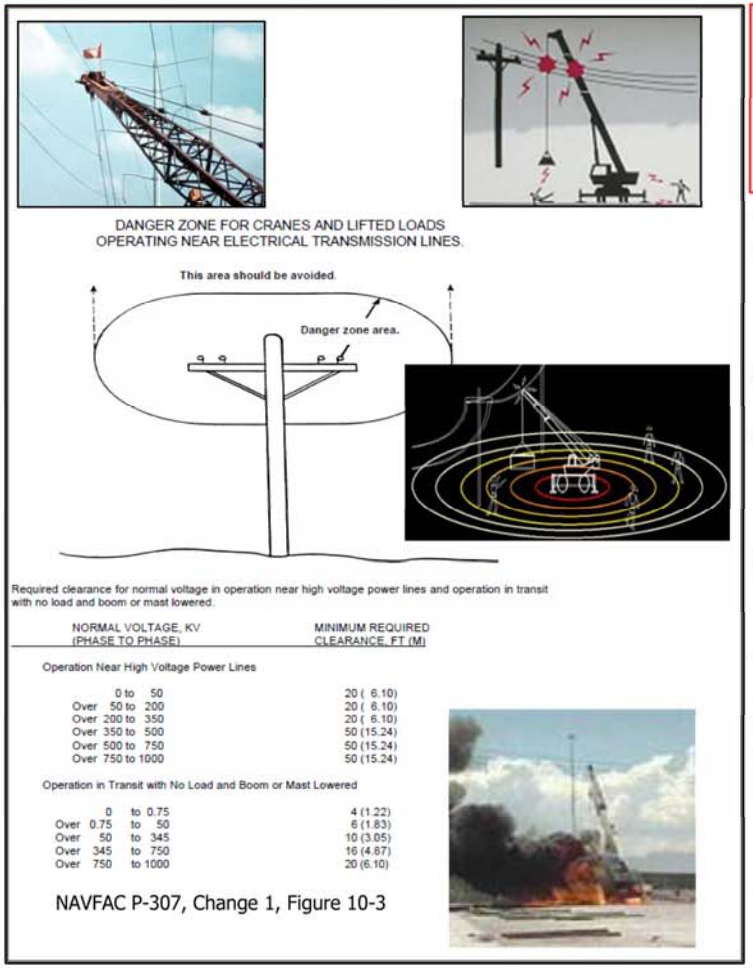
The system shown below has a counterweighted rolling base and adjustable mast that extends to over 20 feet high. A worker connects his harness to a self-retracting lanyard that allows horizontal movement, but will prevent a fall. Larger work areas can be accessed by supporting a structural beam between two portable systems.

Incorporating one of these systems can provide safe, above ground protection to comply with OSHA regulations, which require fall protection when working above 4 to 6 feet depending on the industry. Rentals may also be available on a trial basis.

Navy Shore Weight Handling Safety Brief!

Title: Power Line Safety: New Minimum Operational Clearances

Target Audience: Operators, Riggers, Crane Crews and Supervisors



DANGER ZONE FOR CRANES AND LIFTED LOADS
OPERATING NEAR ELECTRICAL TRANSMISSION LINES.

Required clearance for normal voltage in operation near high voltage power lines and operation in transit with no load and boom or mast lowered.

NORMAL VOLTAGE, KV (PHASE TO PHASE)	MINIMUM REQUIRED CLEARANCE, FT (M)
Operation Near High Voltage Power Lines	
0 to 50	20 (6.10)
Over 50 to 200	20 (6.10)
Over 200 to 350	20 (6.10)
Over 350 to 500	50 (15.24)
Over 500 to 750	50 (15.24)
Over 750 to 1000	50 (15.24)
Operation in Transit with No Load and Boom or Mast Lowered	
0 to 0.75	4 (1.22)
Over 0.75 to 50	6 (1.83)
Over 50 to 345	10 (3.05)
Over 345 to 750	16 (4.87)
Over 750 to 1000	20 (6.10)

NAVFAC P-307, Change 1, Figure 10-3

*** * * REQUIREMENT CHANGE * * ***

NAVFAC P-307, Section 10.11.1 *Overhead Electrical Transmission Lines*

Figure 10-3 *Danger Zone for Cranes and Lifted Loads Operating Near Electrical Transmission Lines*

Minimum operational clearance distances (loaded or unloaded) are:

For voltages up to and including 350 kV the minimum distance is 20 feet

For voltages greater than 350 kV the minimum distance is 50 feet

- **Always treat electrical transmission lines as energized until proven otherwise.**
- **Keep crane booms, wire ropes, rigging, and loads away from electrical power lines. Electricity can arc from the power line to the crane, wire rope, or load and from the crane to nearby personnel. Electricity can pass through a crane and into the earth around the crane. This may expose ground crew personnel to electrical shock.**
- **When operating near energized lines - de-energize and visibly ground the power lines. This is the only sure means of eliminating the electrical hazard.**
- **If a crane is operating close to live power lines and/or if the power lines cannot be de-energized – do not touch the crane and remain >30 feet away. Erect operational boundaries, conduct a briefing, designate a spotter, don proper PPE (which may include electrical PPE), and use non-conductive tag lines.**
- **Do not operate BELOW a live power line. There are two exceptions to this rule, Both require the minimum clearances to be maintained with the crane set-up for maximum reach.**
- **Movement (in non-travel mode) Below a Power Line: If any part of the crane will get closer than the minimum distances to a power line, a spotter is required. When visibility is poor, *identify and illuminate power lines and travel paths.***
- **In the event the crane contacts live power lines – do not touch the crane and remain >30 feet away; call 911. Crane operators should stay on the crane until power is de-energized. If the operator can do so safely, move the crane away from the power line. If fire or other conditions force the operator from the crane, jump clear of the equipment without touching the crane and the ground at the same time. Shuffle away, keeping both feet in contact with the ground until >30 feet away from the crane. Do not attempt rescue until the electricity has been de-energized.**

See NAVFAC P-307 Chg. 1, Section 10.11.1 for a more detailed discussion of requirements.

3 May 2011

SAFETY

Navy Crane Center 11-S-05

Navy Shore Weight Handling Safety Brief!

Title: Rigging Gear Selection and Use

Target Audience: Riggers, operators, engineers, and personnel who use rigging gear

- Selection and proper use of rigging gear is an essential part of every crane and rigging evolution. If the wrong rigging gear is used, or gear is used improperly, the consequences can be disastrous.
- This fiscal year (FY11) 12 crane accidents have been reported where rigging gear was overloaded or damaged (8 rigging gear overloads and 4 damaged rigging gear events).
- In 3 of the 4 damaged rigging gear events; improper, inadequate, or no chafing material was used, resulting in sling damage.
- Listed below are several rigging gear selection and use requirements:
  - The load weight must be determined prior to lifting and rigging gear properly sized to carry the load.
  - In a 2, 3, or 4 point lift, size slings such that 2 legs have adequate capacity to lift the entire load weight, including considerations for sling angle deductions.
  - Use rigging gear per OEM requirements.
  - Ensure rigging gear remains clear of the load and does not snag on the load and/or other equipment during removal.
  - Use adequate chafing material to protect slings and the load from damage due to sharp edges, or configurations that could cause damage.
- Remember, prior to lifting a load, the weight and stress in rigging gear (at angle of use) must be determined and the rigging gear must be sized to carry the load weight. Always use adequate chafing material to protect the rigging and load when rigging gear is subjected to hazards.

SAFETY

14 April 2011

Navy Crane Center 11-S-04

SHARE YOUR SUCCESS

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

WEIGHT HANDLING PROGRAM SAFETY VIDEOS

Accident Prevention, seven crane accident prevention lessons learned videos are available to 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.

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.

Load Testing Mobile Cranes at Naval Shore Activities provides load test personnel guidance on properly testing mobile cranes per NAVFAC P-307.

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 ensures 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 stand alone, topic driven, DVD format upon request.

All of the videos can be viewed on the Navy Crane Center website:
https://portal.navfac.navy.mil/ncc.

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What can we do to better meet your expectations?

Please email your comments and suggestions to ***nfsh_ncc_crane_corner@navy.mil***