



THE CRANE CORNER

Navy Crane Center Technical Bulletin

<https://portal.navfac.navy.mil/ncc>

Editor: (757) 967-3816/DSN 387-3816 / nfsh_ncc_crane_corner@navy.mil

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A WORD FROM TOPSIDE

Sam Bevins

A rigorous self-assessment by activities is a very valuable mechanism to achieve and maintain significant improvements. SECNAVINST 11260.2 and NAVFAC P-307 require that activities provide a weight handling program self-assessment to the Navy Crane Center prior to audits. There are many benefits to the self-assessment concept.

First, personnel in an activity's weight handling program are aware of the problems and challenges faced on a day-to-day basis and can provide valuable insight and opportunities to improve the activity's overall program. This valuable insight provides my audit teams a "head start" with regard to the quality of audit we can provide, and more importantly, assists us in ensuring that activity management is aware of any significant program weaknesses.

Second, our audit teams are only at your activity for a short time once a year or once every two years. The actual deck plate or waterfront audit time is three to four days or less. Additionally, due to the dynamic operational tempos at many of your activities, in some audits our auditors may be able to observe relatively few actual weight handling operations. Being self-critical within all levels of your weight handling program can be instrumental at sustaining the improvements you have made at your activities. Your supervision and management are on the deck plates and waterfront regularly, and it can be of significant benefit if personnel in your command are being self-critical at identifying deficiencies, poor practices, and process improvements.

In FY 2010, your weight handling teams achieved a record setting year, as Navy shore activities recorded the fewest number of crane accidents ever. In addition to our rigorous accident definition, I am a firm believer that our combined focus on continual improvement via critical self-assessment was a key factor in the reduction in crane accidents, and more importantly, an even greater reduction in the number of significant crane accidents.

Despite these gains, our audit teams still identify weaknesses in the self-assessments submitted in support of many of our audits. Examples include self-assessments that do not identify any problems or weak areas, self-assessments that are outwardly focused (contractor issues or the problems are under the cognizance of other shops, codes, or departments), or self-assessments that are not reviewed by activity management and as a result, are focused at too low a level. As important as a strong self-assessment is at improving your overall weight handling program, a weak or inaccurate self-assessment can negatively affect your program by having supervision and management focus on the wrong areas and could result in an ineffective utilization of key activity resources.

The strongest and most accurate self-assessments are developed by activities that have established basic weight handling metrics, have implemented a self-critical surveillance or observation program, and have engagement at all levels of supervision and management.

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These activities are continuously self-critical. A self-assessment should not be something that is thought about once a year or once every two years in advance of the audit, but should be reviewed and revised frequently as conditions change.

In summary, I am challenging each of you to continue your focus on being self-critical during the coming year, not just within your weight handling program, but activity-wide. A successful weight handling program requires the support and buy-in from the entire command. An open, self-critical approach by all personnel across your command, either directly or indirectly involved in weight handling operations, will help improve your mission effectiveness and ensure our common goal of zero crane accidents is realized. ■

NEW OSHA REQUIREMENTS AFFECTING NAVY CRANES USED IN CONSTRUCTION

Background:

On 9 August 2010, the Occupational Safety and Health Administration published a new standard, 29 CFR 1926 subpart CC, for cranes used in facility construction operations. This standard replaces Section 550 of 29 CFR 1926.

Most of the new requirements are already covered in NAVFAC P-307, however there are some requirements not currently addressed. See the Navy Crane Center website, Safety Message 041448Z Nov 10 at the following link: <https://portal.navfac.navy.mil/NCC>. The new requirements are applicable to Navy cranes used in operations covered under OSHA's construction industry standard. If there are questions concerning the applicability of 29 CFR 1926 to work being performed, contact the local Activity Safety Office for guidance.

Direction:

Except where explicitly stated in the requirements, the standard takes effect on 8 November 2010. Therefore, except where noted, the requirements are effective immediately.

Navy Crane Center will incorporate the new requirements into NAVFAC P-307 and UFC 3-320-07N as appropriate via a change to be issued in the near future. In some cases, Navy Crane Center considers a new requirement of sufficient value to be applicable to all Navy crane operations. These will be noted in the forthcoming change. ■

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 194A – Johnson Industries SMAA 16 and SMAA 19 Drum Brake Base Pins

CSA 194A was issued on 27 September 2010 and then superseded by CSA 194B on 4 November 2010

CSA 194B – Johnson Industries SMAA 13, SMAA 16 and SMAA 19 Drum Brake Base Pins

Background:

A. This CSA supersedes CSA 194A in its entirety.

B. The purpose of the CSA is to alert activities of the failure of the magnet base pivot pin (part number JSMPMP400) on the Johnson Industries SMAA 16 drum brake and a potential limited fatigue life for the magnet base pivot pin on the SMAA 13, and 16 drum brake. The location of these pins is shown in the sketch below.

C. An activity servicing a SMAA 16 hoist brake removed the brake coil for replacement. The magnet base pivot pin broke during brake reassembly. Laboratory analysis concluded the pin failed due to fatigue. Laboratory analysis also concluded the fatigue cracks most likely started inside the pin along a lubrication port where a crack cannot be easily detected by visual or other inspection methods. Johnson Industries has confirmed that the pin material is Type 303 stainless steel.

D. Johnson Industries has evaluated the pivot pin design for the SMAA 16 drum brake and has recommended replacing pins having lubrication ports (e.g., drilled for a grease fitting), and that have been subjected to over 225,000 brake cycles. Johnson Industries also recommends future replacement of pivot pins with non-lubricated (solid) pins.

E. Johnson Industries has evaluated the pins associated with the SMAA 13 drum brake and has determined that magnet base pivot pins having lubrication ports (e.g., drilled for a grease fitting) should be replaced with newer style pins that are non-lubricated (solid).

F. Johnson Industries has evaluated the pins associated with the SMAA 10 and SMAA 19 drum brakes and has determined they are adequately fatigue rated.

Direction:

A. Activities shall immediately remove from service (effective date 16 September 2010) all hoists with Johnson Industries SMAA 16 drum brakes that have magnet base pivot pins with lubrication ports, and that have been subjected to over 225,000 cycles of operation. Hoists with SMAA 16 brakes where the number of brake cycles cannot be determined and the magnet base pivot pin has a lubrication port shall also be removed from service.

B. Activities shall install new magnet base pivot pins on hoist brakes identified above prior to returning the hoist to service. Replacement of pivot pins with like replacements (pins with lubrication port) is acceptable for near term corrective action.

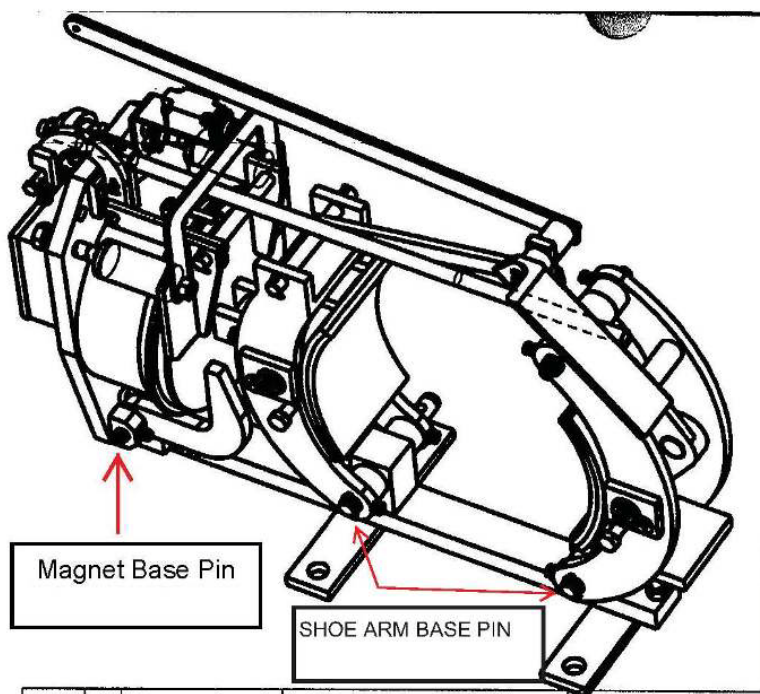
C. For long term corrective action, activities shall install new non-lubricated (solid) pins in all SMAA 16 hoist brakes before or during the next scheduled annual or type B inspection or if the brake is subjected to over 225,000 cycles, whichever comes first. Submit a crane alteration request (CAR) for Navy Crane Center approval for replacing the magnet base pivot pins with non-lubricated (solid) pins.

D. Activities shall install new non-lubricated (solid) magnet base pivot pins in all SMAA 13 hoist brakes before or during the next scheduled annual or type B inspection. Submit a CAR for Navy Crane Center approval for replacing the pins with non-lubricated (solid) pins.

E. Activities may return to service hoists having SMAA 19 drum brakes removed under CSA-194A.

CSA 194B
Attachment 1

JOHNSON INDUSTRIES MODEL SMAA DRUM BRAKE



EQUIPMENT DEFICIENCY MEMORANDUM (EDM)

No EDMs have been issued since the September 2009 edition of The Crane Corner. ■

CRANE ACCIDENT PREVENTION; SAFETY CHALLENGE FOR FY2011

Good news! Directly complementing SECNAV's priority focus on safety and significantly contributing to fleet readiness, the safety and condition of the Navy's shore weight handling programs improved to a record level in fiscal year 2010 - achieving the best performance in the history of the program. In addition to the continued reduction in the overall number of weight handling accidents, the severity of the accidents continues to show very positive improvement; only one accident met the OPNAV mishap classification thresholds (with zero class A or B). There was also an outstanding 25 percent reduction in "significant" accidents (injuries, dropped loads, overloads, and two-blockings). This excellent safety performance is a testament to the dedication and hard work of everyone in the Navy shore weight handling programs around the world. Our challenge will be to continue this positive trend in FY11. Our focus on identifying and reporting virtually every unplanned event and treating each event as an opportunity to learn valuable lessons continues to be effective in minimizing serious accidents. Human error continues to be the primary cause of most accidents.

As we approach the holiday season and winter months, I ask weight handling managers and supervisors to place a special focus on safe crane and rigging operations. We have an opportunity to make FY11 another record year but we have many significant challenges before us. As we move toward the holiday season, in many regions environmental working conditions will continue to worsen and bring ice, sleet and snow conditions. Frigid temperatures and icy conditions pose significant challenges to your crane teams as they support weight handling demands. Operations in cold weather reduce personnel dexterity and induce additional physical challenges, which can lead to accidents. Cranes, barge decks, ground level rails and rail switches can become hazardous for slips, strains, and falls. Exterior working surfaces, platforms, walkways, and ladders are especially prone to icing conditions and appropriate precautions should be put into place to minimize this risk. Cranes and rigging gear are also affected by the cold weather. Crane sheaves and hoist blocks can become iced up or frozen which can result in mispooling conditions and cause damage to critical cranes and components. Ice build up on mobile crane booms can also create hazardous conditions.

Harsh environments are not the only threat to safe crane operations. Crane team continuity could change or become undermanned due to end of year leave use and for those working during this period, thoughts can easily shift toward spending well deserved time with families at home. Even after returning from leave, we have a challenge to safely get re-engaged in our work. Maintaining an ever sharp focus on the critical job at hand during weight handling operations is challenging but we cannot expect anything less.

With the holiday season upon us, managers and supervisors should consider conducting increased surveillance of weight handling operations. Look for signs of complacency or inattention. Make sure that the environment is conducive to safe weight handling operations. Make sure that your crane teams have sufficiently planned the task at hand and all involved personnel understand their responsibilities in support of the task. Proactive leadership throughout the command is a powerful tool in ensuring safe weight handling operations. Consider preemptive safety awareness briefings before and after the holidays to reinforce management's expectations for adherence to safe weight handling requirements and practices. Management should consider and address the impact of the vacation/leave on crane teams. Effective planning, teamwork, communication, situational awareness, and Operational Risk Management (ORM) are all good tools for reducing the risk of an accident. Good job planning and communication go hand in hand.

Each weight handling accident diminishes support to the fleet. A safe and reliable Navy weight handling program is an essential enabler for fleet readiness. We encourage Commanding Officers to intensify your efforts to raise the level of safety awareness in your activity's weight handling operations and continue to strive for the goal of zero weight handling accidents. ■

SUMMARY OF WEIGHT HANDLING EQUIPMENT ACCIDENTS FOURTH QUARTER FY10

For the 4th quarter of FY10, 58 Navy WHE accidents (45 crane and 13 rigging), and 9 near miss accidents (8 crane and 1 rigging) were reported. A total of 11 contractor crane accidents were also reported. Of the 58 Navy accidents, 17 were considered significant (overload, dropped load, two block, or injury). Lessons, which can be shared from the significant Navy crane accidents, are discussed herein.

DROPPED LOADS

Accident: An air conditioning compressor was dropped during the process of rigging it topside for removal from the ship as a result of an incorrectly installed beam clamp used as a “pick point.”

Accident: While lifting an electronics cabinet, the crane was two-blocked causing the wire rope to part and subsequently drop a 520-pound cabinet to the bed of a trailer.

Accident: A two point pick was used to rotate a "fifth wheel" from a trailer down to the deck. The fifth wheel center of gravity was not aligned below the hook, causing it to rotate freely and fall to the ground shock loading the crane and ripping the pendant controller out of the hands of the operator.

Lessons Learned: Weight handling equipment offers extraordinary mechanical advantage for relocating heavy equipment that would not otherwise be moveable. When not used correctly, the loss of control of a load can occur instantaneously. In these instances, it is only by mere chance that personnel were not injured. Ensure personnel are properly trained to use the equipment as required, and validate that that all equipment is being utilized in accordance with the P-307 and OEM requirements.

OVERLOAD EQUIPMENT

Accident: While attempting to lift a temporary shack, the rigging gear (capacity 15,600 pounds) was overloaded. An unverified estimate of the weight of the shack was 12,000 pounds but the initial lift caused an 80 percent alarm in the cab (30,000 lb capacity) to actuate. At supervisory direction, a second attempt was made with a load indicating device (LID) and a stopping point of 12,000 pounds. However, not until the LID registered 16,000 pounds was the lift stopped. This event resulted in two different overloads of the rigging gear.

Lessons Learned: Do not ignore your warning signals. As in many weight handling accidents, post investigations revealed that multiple warning signs (or indicators that something was wrong) were present leading up to the event - but were either missed or ignored. Safety devices on WHE are intended to assist the operator in warning of impending danger. When safety devices provide warnings, the warning is valid until it is proven otherwise. If there is any doubt about the proper function of a safety device, the crane should be removed from service until the activity engineering organization evaluates the condition and approves its continued use.

PERSONAL INJURY

Accident: While reeving the hoist wire rope, a rigger's thumb was caught between a sheave and the hoist rope, breaking his thumb.

Accident: During a crane operation, a rigger's right hand was caught in a pinch point breaking the tip of his finger.

Accident: While rotating a rigged component, it suddenly dropped approximately one foot onto the angled deck of a tank. Due to the angled deck, the component and a machinist (still grasping the component) slid approximately four feet coming to a stop at the lower end of the tank. The machinist was injured with bruising and minor lacerations.

Lessons Learned: Keep eyes on the load and watch for the motion of the load and gear. Personnel should be aware of all movements of the load and all potential pinch points. Being caught between a fixed and stationary object is one of the most frequent causes of rigging related injuries, resulting in lacerations, fractures or amputations. Apply the principles of Operational Risk Management and ask yourself, "What will happen if this moves? Will I be in the path of that movement? How can I do this job safely?" Discuss and point out pinch

point hazards as part of your risk assessment and pre-job briefing. Personnel not directly involved in the weight handling operation should be kept at safe distances out of the operating/rigging envelope.

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. ■

Navy Shore

Weight Handling Safety

Brief!

Title: Contracting Officer Responsibilities

Target Audience: Contracting Officers for Contracts where Cranes may be Operated



- Contracting officers should be familiar with the requirements of paragraph 1.7.2 of NAVFAC P-307, and provide for oversight of crane and rigging operations as well as oversight of the investigation should an accident occur.
- **When Weight Handling Equipment services are contracted, it is the Contracting Officer's Responsibility to ensure P-307 requirements are being met.**
- Recent significant accidents involving contracted cranes/services include:
 - Overturned cranes.
 - Collapsed boom.
 - Crane rotated into power lines.
 - Crane overload to 200% of rated capacity.
 - Improper use of government owned crane in an attempt to lift structures embedded in concrete.
- Contracting officers play an essential role in a safe and reliable Weight Handling Program!

27 September 2010

SAFETY

Navy Crane Center 10-S-04

Title: Mobile Crane Setup Requirements

Target Audience: Crane Operators, Rigging and Oversight Personnel



Recent trends are indicating problem areas in crane set up. Several reported accidents were directly caused by the improper set-up of the crane. Specific weaknesses have been identified in the execution of the following mobile crane set-up requirements:

- Operators must check and ensure adequate ground loading capacities exist for the setup location.
- Adequate cribbing must be used for crane support.
- Outriggers must be fully extended per crane manufacturer's (OEM) requirement. Partial extension allowed only if permitted by the OEM and within the capacity charts provided for that purpose.
- Operator (or designee) must visually verify that outriggers have been properly extended. Additional personnel should be used to assist in setup if the area is congested or there are restrictive clearances.
- The crane shall be uniformly level within one percent of level grade and located on firm footing.
- Operation near high voltage lines require specific set up distances, depending on voltage.
- The crane's swing radius must be barricaded to protect against potential pinch-point/crush hazards.

The video "Mobile Crane Safety" provides additional information on proper set-up and operations. It can be found at the following link:
https://portal.navfac.navy.mil/portal/page/portal/navfac/navfac_wow/pp/navfac_nce_pp/tab66035:tab105078

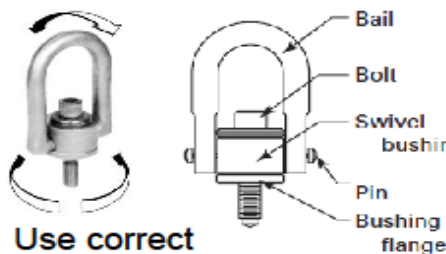
2 November 2010

SAFETY

Navy Crane Center 10-S-05

Title: Proper use of Swivel Hoist Rings

Target Audience: All rigging qualified personnel.



Use correct thread size and fully seat body.



Use a torque wrench. Don't 'hand tighten'.



- Swivel Hoist Rings (SHR) can be one of your best pieces of rigging gear when used properly.
- They can be used at any angle up to 90 degrees with no reduction in rated load.

For Swivel Hoist Rings:

- Ensure the **bushing flange** is **fully seated** against the load surface. (Spacers and washers are not allowed)
- **Tighten to the manufacturer prescribed value** using a **torque wrench**. Guessing doesn't work!
- The **SHR** must be **free to rotate and pivot** without interference.
- Any attached **load handling component** (sling, hook, etc.) connected to the **SHR** must be narrower than the inside width of the bail to avoid spreading and must be **centered** in the bail to prevent side loading. **Never use more than one attachment in a SHR**. This will cause the bail to spread and fail.
- In addition to the above, SHR's shall meet the selection, use, and maintenance criteria of **NAVFAC P-307 Paragraph 14.8 & 14.8.8**.

3 November 2010

SAFETY

Navy Crane Center 10-S-06

Unseen Water That Is Corroding Your Equipment!

An inspector recently found the bleeder plugs on a Grove RT crane outrigger hydraulic jacking cylinder to be badly corroded. A plastic cap placed over the end of the cylinder “protects” this and other components. However, the cap’s shape allowed water to pond and seep through its retaining stud. The water then collected in the pocket of the socket headed plug, allowing corrosion to set in.



These plastic caps can be found on Grove cranes using the inverted hydraulic jacking cylinder design since 1990. If water intrusion is a concern, the OEM recommends adding a bushing beneath the cap nut and sealing with RTV or similar.

Minor water seepages like this are often unavoidable on outdoor equipment. Activity inspectors are reminded to be on the lookout for areas where water runs or collects and check for corrosion or deterioration. ■

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.navy.mil/ncc>. ■