THE CRANE CORNER

Navy Crane Center Technical Bulletin

http://www.navfac.navy.mil/ncc ***87th Edition – September 2015***

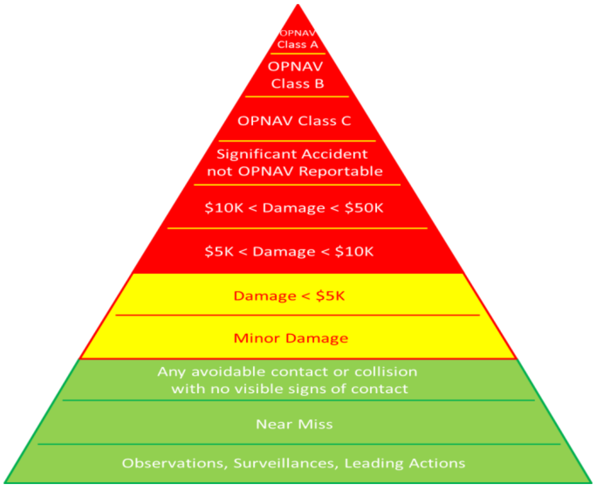
Editor: (757) 967-3857/DSN 387-3857 / nfsh_ncc_crane_corner@navy.mil

A WORD FROM TOPSIDE

Tim Blanton

As most of you are well aware, the Navy's crane accident definition is purposefully broad, encompassing events well below thresholds set within general industry as a means to sensitize activities to the importance of recognizing events at the lowest level. Navy Crane Center is currently in the process of a major revision to NAVFAC P-307, which will include some modification and clarification of the accident definition. In particular, the term "unplanned contact" will be replaced with "avoidable contact" in order to remove ambiguity from the current definition and help ensure activities understand that contact is something that should be avoided whenever possible. In addition, the term "significant accidents" will be included, which is already being utilized within the weight handling community to describe accidents that have the potential to severely impact an activity's mission. It is important to note that some significant accidents may appear to be minor events (e.g., two-blocking with no damage or an overload where there is no apparent damage to the crane or rigging gear), however, these types of accidents have a greater potential to result in serious injury or substantial property damage and require a more detailed investigation. The following accident types are considered **significant accidents**: injuries, overloads, dropped loads, two-blocks, crane derailments, or contact with overhead electrical power lines.

The figure (expanded accident severity triangle) below illustrates a different way to "levelize" accidents and near miss events. This expanded triangle is part of a pilot program developed by the Navy Crane Center with the anticipation that activities could incorporate or develop a similar concept to improve their accident investigation and prevention programs. It takes the existing safety triangle and further expands the intermediate levels to provide additional insight with regard to the health and maturity of an activity's accident and near miss information.



Inside This Issue

A Word from Topside, Pg. 1
Weight Handling Safety Briefs, Pg. 2
Summary of WHE Accidents, Third Quarter FY15, Pg. 5
Tip of the Spear, Pg. 8
Variable Frequency Drive Firmware Updates, Pg. 10
Share Your Success, Pg. 11
Weight Handling Program Safety Videos, Pg. 11

The next progressive step in this pilot program consists of assigning values for the severity of the weight handling events and developing a weighted average that can be calculated to determine an overall "severity level." As I have noted before, by responding with open thoughts and strong corrective actions to the underlying causes and human behaviors at the root of weight handling accidents or to trends identified at the base of triangle, the more significant events at the top have a greater potential to be arrested. I believe that incorporation of this approach can benefit activities by providing perspective on each event and helping determine the health of the program. Some activities have begun utilizing this concept by incorporating a layered accident investigation process into their local instructions. In these pilot programs, the level of severity is determined according to a pre-established "levelization" table or chart in order to identify the immediate action response needed for investigating the event. An additional advantage is that resources are more efficiently allocated, thereby minimizing cost. Efforts like this that are utilized by activities go a long way in creating a mature program and improving overall weight handling program safety. The table above can be utilized to assign a value for each event, and can then be averaged to assign an overall value for a specified period of six months or a year in order to gauge the overall health of the program as it relates to accident severity. By applying an appropriate weight value based on severity, activities that identify numerous/several events at lower levels will have an overall lower score than activities with even one or two events at higher levels (level 7 or level 8). Nonetheless, the weighting is assigned such that even one pinnacle event cannot be overcome by simply increasing reporting of lower level events. Keep in mind that this system is another tool in the arsenal to assist the activity in assessing and evaluating trends that can lead to improvements in weight handling program safety. The use of this information is not mandatory, but activities should consider the benefits of utilizing this pilot initiative or a similar type version at their activities.

Level	Category	Weight	Assigned$	Add (Assigned$/5K)	Score
10	OPNAV "Class A" Accident (>$2M damage or fatality, perm disability)	80	$2M	400	480
9	OPNAV "Class B" Accident (>$500K damage, perm partial disab, 3 or more hosp)	40	$1M	200	240
8	OPNAV "Class C" Accident (>$50K damage, lost work day(s))	20	$250K	50	70
7	NCC Significant Accident < Class C	10	$50K	10	20
6	Damage < Class C (>$10K, <$50K; crane load/ gear) Clear signs of contact and damage	5	$25K	5	10
5	Damage ≤ 1/5 of Class C (≤$10K, >$5K; crane load/gear) Clear signs of contact & damage	4	$7.5K	1.5	5.5
4	Damage ≤ 1/10 of Class C (≤$5K; crane load/ gear) Clear signs of contact and damage	3	$2.5K	.5	3.5
3	Minor Damage (crane load/gear) Clear signs of contact	2			2
2	Any unplanned contact/collision (crane load/gear), no visible signs of contact	1			1
1	A near miss report of any kind	0			0

WEIGHT HANDLING SAFETY BRIEFS

*N*avy Shore Weight Handling Safety Briefs (WHSB) are intended to be a concise and informative, data driven, one page snapshot of a trend, concern, or requirement related to recent/real time issues that have the potential to affect our performance and efficiency. The WHSB is not command specific and can be used by your activity to increase awareness of potential issues that could result in problems for your weight handling program. The WHSB can be provided directly to personnel, posted in appropriate areas at your command as a safety reminder to those performing weight handling tasks, or used as supplemental information for supervisory use during routine safety meetings. Through data analysis of issues identified by accident and near miss reports, and taking appropriate actions on the information we gain from that analysis, in conjunction with effective communication to the proper personnel, we have the tools to reduce serious events from occurring. As we improve the Navy Weight Handling safety posture, we improve our performance, thereby improving our efficiency, resulting in improved Fleet Readiness!

When WHSBs are issued, they are also posted on the NCC's web site at: http://www.navfac.navy.mil/ncc.

This WHSB addresses an emerging accident trend that involves hoist chains (load chain and pull chain) contacting, snagging, or hanging up on equipment or fixed structures. This brief reiterates good rigging practices to prevent these types of accidents from occurring.

Navy Shore Weight Handling Safety Brief!

Title: HOISTS: PREVENTING PULL / LOAD CHAIN DAMAGE

Target Audience: CRANE TEAMS and CATEGORY 2/3 CRANE OPERATORS and RIGGERS

Unsafe Rigging Practice

The hoist chain is hanging carelessly. It's unmonitored and making contact with machined surfaces and building equipment allowing the potential for damage.

ASME B30.16-1.3.3(g)

Where slack load chain hanging down from the hoist may create a hazard to the operation or to personnel, a *chain container* recommended by the OEM should be used.

An emerging Navy-wide trend shows activities are experiencing crane and rigging accidents when **hoist chains (load chain and pull chain) contact, snag, or hang up on equipment.** In many of these events, the chain was allowed to extend/hang, uncontrolled, below the load. This unsafe rigging practice increases the opportunity for damage to the crane, the hoist, the chain, and nearby equipment. (see the picture at top left)

When using a hoist, a good rigging practice is for the user to place slack hoist chain in an original equipment manufacturer (OEM) approved or provided chain container (bag) suspended from the hoist.

When a chain hoist is not in use, a common method of securing the pull chain is to tie it around the load chain [using a half hitch]. This rigging practice provides two levels of safety. First, it minimizes the opportunity for uncontrolled lowering of the chain fall/hoist should the brake malfunction and second, it positions the pull chain above the load where it can be monitored.

Supervisors and Riggers-in-Charge: Plan and brief safe rigging practices to control the use of chain falls/hoists in a manner that mitigates or eliminates chain related concerns.

Crane Operators: Before hoisting, challenge and prompt users to verify that the chain is secure (i.e., controlled and monitored).

Users: Do not allow hoist chains or other rigging gear to suspend below the load. If a crane is involved in the lift and the load will be hoisted a few inches before a chain fall is operated, the chain shall be monitored and controlled by the user to prevent hang-ups, snags, and critical surface contact.

4 August 2015

SAFETY

Navy Crane Center 15-S-06

SUMMARY OF WEIGHT HANDLING EQUIPMENT ACCIDENTS
THIRD QUARTER FY15

For the third quarter of FY15, 93 Navy weight handling accidents (69 crane and 24 rigging) were reported. The number of accidents increased by 48 percent over the second quarter, but the number of significant accidents (overloads, dropped loads, injuries, two-blocks, derailments, contact with electrical transmission lines, overturned cranes) remained nearly constant. Significant accidents are accidents that have the potential to result in substantial cost or serious injury and may require a more detailed investigation. In the third quarter, nearly three times as many crane accidents were identified as compared to rigging accidents, but rigging accidents accounted for the majority of significant accidents. Rigging accidents have accounted for 50 percent of the significant accidents reported in FY15. This was a substantial shift from FY14 when crane accidents accounted for 75 percent of the significant accidents. Of the 13 crane and rigging accidents reported by contractors, four were significant accidents.

INJURIES

Accidents: Six injuries were reported in the third quarter, three of which were classified as OPNAV class "C" mishaps. Four occurred as a result of employees being struck by a load or rigging. A rigging accident occurred when an improperly installed brace separated and struck an employee in the face while rigging a turbine. A sea water pump cover slipped from the rigging and bounced off the deck onto an employee's foot resulting in two broken bones. A mechanic sustained an injury to his hand when a knot in the lashing came loose, allowing a crank case block and balance weight to fall onto his hand, severely fracturing his thumb. A crane walker lost his balance and fell, causing his foot to become wedged under the travel truck of a portal crane. While preparing to place a launcher onto its base using an overhead crane, the sling connecting the launcher to the crane hook slipped, causing the launcher to strike a worker on the back of the hand as it fell to the shop floor. A ship's force sailor was injured when he placed his arm between a brace and a component being lifted (pinch point) by the crane.

Lessons Learned: Like the previous quarter, improper rigging techniques were identified as the root cause in the majority of accidents that resulted in injuries. Use of rigging fundamentals is necessary in order to prevent loads from coming free of the rigging gear. In one instance, an unbalanced and asymmetrical load contributed to the load falling out of the sling. When rigging a load of this type or a load with a high center of gravity (CG), personnel must utilize frapping or lashing to help stabilize and support the load. Slings used in a sweeping configuration under a load must be secured in place to prevent inadvertent shifting or movement of the load. Gear selection was a problem in another instance where a wire rope sling (instead of the nylon sling that was used) would have prevented a dropped load and subsequent injury. Lastly, personnel must remember not to put themselves or their extremities beneath the load, and they must be aware of the possibility of the load coming free from the rigging or a failure occurring in the rigging gear.

DROPPED LOADS

Accidents: Five dropped load accidents were reported. During a load test of a shipboard mooring capstan, a double braided nylon hoist line failed and parted, causing the test weights to drop six inches to the reinforced deck area of a floating crane deck. A wire rope sling's swaged fitting failed during a lift of an aircraft gearbox from a shipping container, allowing the gearbox to drop onto the shipping container. A load fell from a forklift attachment when a shackle failed as a result of being side-loaded. Rigging gear and a handling tool were being hoisted to attach a load when a nut on the gear unthreaded and fell to the deck. During a lift of a section of staging, the wire rope sling used to lift the staging detached from the hook, allowing the staging to drop to the deck.

Lessons Learned: Dropped load accidents are significant accidents that have the potential to result in serious personnel injury and/or equipment damage. Rarely do these types of accidents occur without multiple root causes. Reports submitted by various activities identified issues with inadequate job planning, inability to recognize the lift as complex (critical), and improper rigging. Usually, recognition by the team of just one of the contributing causes can prevent the event from occurring. Supervisors should encourage all personnel to focus on their particular assignment but also to pay attention to the job as a whole and to stop when something does not look right. One particular set of problems resulted in a 37,500-pound test weight being dropped when a synthetic hoist line parted while load testing a capstan. Personnel could have easily been injured when the lined snapped back and impacted a bulkhead. The investigation concluded that the line was significantly undersized for the load in the planned configuration, and it was determined that blended crews (crane team personnel from different organizations) disrupted the decision-making process. Additionally, management did not recognize the lift as complex (critical), thereby, not implementing the additional requirements associated with a complex (critical) lift. The most important issue to stress with your crane and rigging teams is to never be under a suspended load, or unnecessarily be positioned in a fall zone.

OVERLOADS

Accidents: Six overload accidents were reported, and all resulted in rigging gear overloads. During the extraction of an adapter from a shipboard tube assembly, the canister adapter became wedged three feet from the top and overloaded the rigging gear. Slings were overloaded when used to lift a load that exceeded their rated loads. A special lifting tool was overloaded during a load test. Rigging gear was overloaded when a rigger deviated from the approved complex rigging plan and substituted incorrect rigging gear to off-load an excavator. Two chain falls being used to lower a mast were overloaded when the mast unexpectedly became bound. Rigging gear being used to remove a shipboard sill assembly was overloaded when the sill assembly bound up, causing the safe working load to be exceeded.

Lessons Learned: Improper rigging was identified as the primary cause of the rigging gear overloads this quarter, but a more focused look of each accident identified several additional contributors. Based on the information provided in the accident reports, gear selection was an issue in half of the accidents. Although the weight of the load was within the gear's rated capacity, the delta between rated capacity and weight of the load was marginal and personnel did not consider the potential effects of binding. When planning a lift in which binding is a possibility, the lift must be recognized as a complex (critical) lift and additional planning and supervision is necessary. In these instances, supervisors are required to ensure that the correct gear is utilized from both the aspects of rated capacity and functionality. In one instance, a chain fall was selected based solely on the capacity with no consideration given with regard to the binding condition and speed of operation. A larger chain fall would have prevented an overload of rigging gear due to the amount of force applied when operating the chain fall in a slow and controlled manner. A detailed and interactive brief would, in many instances, prevent accidents like these from occurring.

Crane accidents spiked during the third quarter of FY15 and 46 percent were classified as load or crane collisions. Of the 69 reported accidents, 59 resulted in lower threshold damage and only two accidents reported no signs of visible damage. We encourage reporting of minor accidents along with near misses as it helps activities trend and analyze data in order to implement actions that prevent the occurrence of more significant accidents. The reported causes of the damage were identified as improper operation, procedure failure, and improper rigging. In many instances, personnel did not perform properly due to inattention, poor judgment, overconfidence, or were in a hurry to complete their work. Teamwork among the operators, riggers, and supervisors is paramount for achieving safe crane operations. Even with proper planning and risk mitigation, weight handling professionals must exercise situational awareness by remaining constantly vigilant of the changing conditions in and around the operating envelope.

Near misses reported through the first three quarters of FY15 have increased by 25 percent over the previous year; however, the third quarter numbers declined by 34 percent from the second quarter. The increase in near miss reports indicate have begun to see the value of identifying and assessing near misses. The efforts of activities utilizing this accident prevention technique are beginning to pay off, as significant crane accident totals for FY15 have declined. There is still much work to be done in order to reduce the number of significant accidents to zero and effect long lasting improvement in overall weight handling safety. Near miss data for this quarter suggests a need to renew our efforts in the identification of near misses, especially in the area of rigging operations. Recent near miss data indicates a need to focus on controlling the operating envelope and improving crane operations. Some near misses identified crane miss-spools, side-loading of the crane, and even a crane block hoisted into the upper limit. These types of near misses suggest the need to increase focus on during operation of the crane. One additional item to mention relates to ensuring the load is free to lift. Several rigging near misses and one crane near miss described situations where the rigger was informed that the load was ready to be lifted when it was not. It is incumbent on the rigger-in-charge to verify that all fasteners are removed, as the consequences typically always result in damage to the load.

Weight handling program managers and safety officials should review the above lessons learned with personnel performing weight handling functions and share lessons learned at other activities with all weight handling program personnel at your activity. Activity Commanding Officers are reminded of the need to increase their focus on rigging operations due to recent personnel injuries and the higher number of significant accidents in this area. Your recognition of the value in identifying lower level events for the purpose of determining areas that require improvement are making a difference. Only with your continued efforts, can the goal of reducing significant accidents to zero be achieved.

TIP OF THE SPEAR
(Notable Evaluation Items)

Navy Crane Center's evaluations are conducted with the objective of improving weight handling programs by identifying violations, deficiencies, and poor practices to highlight systemic weaknesses or vulnerabilities. Depending on the severity level, problems identified but not corrected may negatively impact a command's mission through inadequate or degraded weight handling support. In some instances, significant items are broken out from other items identified in the report. Significant items will typically require immediate management attention to address, evaluate, and determine effective corrective actions to mitigate the deficiency or vulnerability. Other items identified during evaluations, while not significant in and of themselves, should be trended and analyzed with other data sources (e.g., activity surveillance programs, internal audits, and other external evaluations) to identify potentially higher-level problems for proactive problem mitigation. Accordingly, Navy Crane Center revised the evaluation response format to require identification of root causes for significant items and any other higher level issues as identified by management. Focusing management's attention and problem resolution efforts to the most severe problems ensures that the requisite level of oversight is provided to mitigate the largest issues facing the command.

Significant item evaluation responses should be performed in four phases: problem definition, causal analysis, corrective actions (short and long-term), and performance target metrics (follow-up). The first step requires defining the full scope and breadth of the problem. This phase of the response is essential, as the full extent and reach of the problem must be correctly identified; otherwise, problem resolution may only affect symptoms and not the problem source.

The second phase, causal analysis, has been discussed in previous Crane Corner articles and weight handling safety and training bulletins. Poor root-cause identification has a high potential to lead activities astray, as problems can be oversimplified or further complicated by identifying numerous extraneous causes or deficiencies that are, at best, loosely related. A potential reason for ineffective causal analysis stems from a standard approach to use specially appointed teams or groups to identify the underlying causes. Teams or groups that lack authority or lack senior management engagement and perspective can lead to a large number of generic corrective actions. While this effort is well intentioned, the result can be a negligible change due to lack of priority, drive, or applicability to the major problem area.

The third phase involves developing and enacting effective corrective actions. Developing the proper mix of short and long-term corrective actions is essential for sustained improvement. Short-term actions are implemented to cause an immediate stop to problem-related consequences until long-term actions can be implemented. A core component to short-term corrective actions is that the actions have an intended end date, which should coincide with the enactment of long-term actions. In some cases, activities leave short-term actions in place for an extended period. This tends to only create additional administrative requirements with little value. Long-term corrective actions are intended to have a permanent effect on resolving the problem (e.g., process or procedural changes, staffing changes, accountability changes, value-added requirements). Too often training and briefings, which are actually short-term actions, are inappropriately used as a long-term action. Training in itself could be a long-term action, but only if actions are taken to significantly improve or upgrade initial and continuous training. One-time, stand-up, or ad-hoc training should never be considered a long-term corrective action.

The final phase involves identifying target performance thresholds using metrics. Too often, the target metric is based upon key lagging measures of performance. For example, the number and severity of crane or rigging accidents. This is a reactive metric, which may fluctuate depending upon workload and naturally occurring performance shifts. A better measure would be to establish a metric based on some of the actions being taken to drive performance in this area. For example, where an activity experiences an increase in accident severity for in-hull rigging, one long-term action may be to establish improved in-hull surveillance expectations for supervision and management. The local process is revised and improved (third phase), and then performance metrics are established to review the number and quality of in-hull surveillances, which could then be reviewed for trends and additional corrective actions, if warranted.

By using metrics driven by increased management expectation levels, versus compliance-based metrics, leading indicators can be identified prior to negative events occurring. Depending on the effectiveness of corrective actions as measured in this phase, follow-up actions may need to be developed and enacted to change course (implement new or different actions) if the desired outcome is not achieved.

The following are examples, identified from recent evaluations, of evaluation responses having minimal affect in mitigating identified significant weaknesses:

Example 1: Over time, a large activity crane inventory became more technically complicated as new equipment was phased into the program and existing equipment was overhauled and upgraded. Engineering staffing remained unchanged, resulting in increased overtime and equipment downtime, as system-specific knowledge was outside of current proficiency levels. The vulnerability was identified with a potential impact on future mission. The parent command was aware of overall staffing problems at the activity but did not assign a task team to fully evaluate the problem and develop corrective actions until after the evaluation. Numerous actions were developed but were not prioritized or fully implemented. Additionally, as the chosen long-term solution has not yet developed (difficult to fill engineering position are not yet staffed), the engineering area has effectively no corrective actions, and the next Navy Crane Center evaluation found the engineering problem more widespread and part of a more significant item. While the decision to get the key position was good, no short or intermediate-term actions were enacted (such as utilizing other internal resources, contracting, or reduction of ancillary tasks), resulting in the problem getting worse.

Example 2: An activity started experiencing critical crane breakdowns and unexpected increased down times. As maintenance teams worked on individual problems, the occurrences appeared to be isolated; however, lagging metrics indicated the problem was more widespread. Significant effort was applied in the crane maintenance area, and although the outages decreased, the overall time to perform maintenance during planned availabilities increased over the years, having the potential to affect the activity's production needs. Corrective actions applied were numerous, but not prioritized, making it extremely difficult to determine which actions were actually affecting change. In this example, since the original problem was not well bounded to begin with, corrective actions have had minimal effect, resulting in continued weakness in crane maintenance, with the problem predictably worsening.

Example 3: Many activities have started to document observations (i.e., surveillances), but have noted a lack of input across all levels (deckplate, supervision, management, or dedicated oversight personnel). In one example, an activity had documented findings when dedicated weight handling program personnel performed observations, but there were no findings identified by other personnel involved in the program (e.g., production shop personnel performing Category 3 crane operations). During the subsequent Navy Crane Center evaluation, the evaluation team identified deficiencies and poor practices in production shop crane operations. Review of corrective action for this problem showed that although management took action to assign a target number of surveillances to be done weekly or monthly, the participation rates and quality of findings across all levels of personnel involved in the program were not addressed. In this case, corrective actions were ineffectively assigned to a symptom (need more surveillance in this area), instead of the true root cause (lack of quality findings to allow for trending of common problems).

VARIABLE FREQUENCY DRIVE FIRMWARE UPDATES

Similar to mobile phones, computers, and other electronic devices, variable frequency drives (VFDs) have firmware installed to control the device. Firmware is permanent, read-only, and is not accessible by the VFD user. Firmware in VFDs should not be confused with the programmable parameters, which are user-adjustable as described in the operating manual of the Original Equipment Manufacturer (OEM).

Recently, an activity reported an anomaly on a Magnetek Impulse VG+ Series 3 VFD that caused nuisance encoder feedback faults (also known as PGO faults). It was found that, while operating the hoist, the drive would occasionally attempt to control the hoist without signaling the brakes to release. Because the brakes were not commanded to release, a fault would occur. While the nuisance fault did not pose a safety issue (the brakes remained applied), the activity spent numerous days troubleshooting the issue. Due to the sporadic nature of the problem, the specific condition was very difficult to replicate.

After extensive troubleshooting, the OEM was able to determine the root cause of the VFD anomaly as being an issue with the firmware. Final resolution was a revision to the drive's firmware. This is not the first activity to report this situation where a sporadic nuisance fault was eventually determined to be caused by an internal firmware issue on cranes with VFDs.
Activities experiencing nuisance trips with VFDs are reminded to contact the VFD OEM for assistance in troubleshooting when necessary. Although typically not the root cause, activities should be aware that a firmware update may be required occasionally and should be discussed with the OEM as part of the troubleshooting process. Additionally, activities are reminded that VFD faults that are attributed to firmware issues should be reported to Navy Crane Center

utilizing a Weight Handling Equipment Deficiency Report (WHEDR), as required by NAVFAC P-307, paragraph 2.1.1.

SHARE YOUR SUCCESS

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

WEIGHT HANDLING PROGRAM SAFETY VIDEOS

Jay Stairs

Accident Prevention provides seven crane accident prevention lessons learned videos to assist activities in raising the level of safety awareness among their personnel involved in weight handling operations. The target audiences for these videos are crane operations and rigging personnel and their supervisors. These videos provide a very useful mechanism for emphasizing the impact that the human element can have on safe weight handling operations.

Weight Handling Program for Commanding Officers provides an executive summary of the salient program requirements and critical command responsibilities associated with shore activity weight handling programs. The video covers NAVFAC P-307 requirements and activity responsibilities.

Mobile Crane Safety covers seven topics: laying a foundation for safety, teamwork, crane setup, understanding crane capacities, rigging considerations, safe operating procedures, and traveling and securing mobile cranes.

"Take Two" Briefing Video provides an overview on how to conduct effective pre-job briefings that ensure interactive involvement of the crane team in addressing responsibilities, procedures, precautions, and operational risk management associated with a planned crane operation.

Safe Rigging and Operation of Category 3 Cranes provides an overview of safe operating principles and rigging practices associated with Category 3 crane operations. New and experienced operators may view this video to augment their training, improve their techniques, and to refresh themselves on the practices and principles for safely lifting equipment and materials with Category 3 cranes. Topics include: accident statistics, definitions and reporting procedures, pre-use inspections, load weight, center of gravity, selection and inspection of rigging gear, sling angle stress, chafing, D/d ratio, capacities and configurations, elements of safe operations, hand signals, and operational risk management (ORM). This video is also available in a standalone, topic driven, DVD format upon request.

All of the videos can be viewed on the Navy Crane Center website:
http://www.navfac.navy.mil/navfac_worldwide/specialty_centers/ncc/about_us/resources/safety_videos.html.

HOW ARE WE DOING?

We want your feedback on the Crane Corner.
Is it Informative?
Is it readily accessible?
Which types of articles do you prefer seeing?
What can we do to better meet your expectations?

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