THE CRANE CORNER

Weight Handling Equipment Technical Bulletin ***33rd EDITION - Web Version***
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A WORD FROM TOPSIDE

Sam Bevins

In the last edition of the Crane Corner, I noted that weight handling equipment accidents by Navy shore activities in FY01 were down 27 percent from the previous fiscal year and 40 percent below our baseline year of FY99. This reduction represents a significant improvement in the overall safety of crane operations in the Navy. While we must all work hard to continue these positive improvement trends in the safety of Navy crane operations, I want to alert you to the increasing reports of serious contractor weight handling accidents around Navy personnel, ships, aircraft, and buildings.

The increasing trend in number and severity of accidents associated with contractor crane operations on our installations represents an unacceptably high level of risk. Within the last year alone, there have been five instances of contractor cranes overturned, several instances of dropped loads including a collapsed boom, an incident of damage to Government property estimated to be $450,000, and one contractor employee fatality. There have been four fatalities as a result of contractor crane accidents on Navy property in the past six years. The tragic loss of life and material loss associated with these events must be prevented.

The contractors involved are performing work in accordance with contracts administered by contracting officers. When the work performed involves crane operations, NAVFAC P-307 prescribes minimum requirements for controlling contractor cranes that must be included in all contracts. The minimum requirements for contractors include compliance with applicable ASME standards for cranes, certificates of compliance that the crane and rigging gear meet applicable OSHA regulations, certification that the crane operator is qualified for the crane to be used, controls for performing critical lifts, etc.

Our audits confirm that most naval shore activities have issued local directives to promulgate the P-307 requirements for controlling contractor crane operations. The challenge now is to follow through to ensure that, at least, the minimum requirements are implemented effectively.

Every member of the naval shore weight handling community around the world is committed to improving the safety of weight handling operations. We need this same level of commitment from contractors operating cranes on our installations. I ask you, who are in leadership and management positions in the weight handling and contracting officer communities, to intensify your efforts in reviewing contractor crane operations for compliance with requirements for safe operations. Weight handling is an inherently risky operation. Working together, we can improve the safety of contractor crane operations on our installations. In so doing, we will be making a significant contribution to fleet readiness. ■

Inside This Issue

HAVE YOU HEARD ABOUT?

A key assembly, comprised of three cat-eye profiled segments and a socket head screw, avoids the need for stringent machining tolerances and reduces the stress risers in the keyseats. As can be seen from figure 1, when the socket head screw is tightened, the slanting contact faces between the segments force their profiled surfaces against the keyseats for a tight fit. Key assembly "expansion" is between 0.016 and 0.064 inch, depending on size.

The keyseats are machined with standard end mills - a plain end mill for the hub (advanced axially parallel to the bore axis), and a ball-end type for the shaft (advanced at right angle to the shaft axis). The relaxed machining tolerances facilitate installation of any number of key assemblies around the shaft/bore interface for increased torque capacity. The key assemblies are well suited for transmitting reversing loads, and are reusable.

Figure 1 - Key Assembly

The key assemblies are available in standard sizes of 5/32, 5/16, and 5/8 inch (end mill diameters) with shear load ratings of 2800, 10,250, and 46,500 pounds, respectively, for AISI 1040 steel segments. In critical applications, the socket head screws should be secured against possible loosening by means of any conventional locking method. The cost of standard size key assemblies is about $5.00 each. Larger sizes and other segment materials are available on request.

2002 NAVY WEIGHT HANDLING EQUIPMENT CONFERENCE

The Navy Crane Center (NCC) is hosting a Weight Handling Equipment (WHE) Conference at the Pensacola Naval Air Station Conference Center, on 14-16 May 2002. The purpose of the conference is to share WHE improvement practices and safety initiatives as well as to discuss common issues with the goal of further improvements in WHE safety, maintenance management, engineering, and operations. All Navy shore activities and shore-based operational units with WHE are invited to attend and participate. (There are no registration fees for the conference.)

TENTATIVE AGENDA

Tuesday, 14 May 2002

0800 - 1700

NAVFAC Perspective of Navy WHE Program	SECNAV Perspective of Navy WHE Program
The Ways We Choose – Lessons for Life	Operational Risk Management
Human Factors in Accidents	Historical Review of Navy WHE Accidents
Accident Prevention Initiatives	Contractor Crane Management
National Commission for Operator Certification	

Wednesday, 15 May 2002

0800 - 1700

Fleet Perspective of Navy WHE Program	Regionalization of WHE Programs
NAVFAC IG Review of PWC Crane Programs	Mobile Crane Acquisition
Northrop Grumman-Newport News WHE Program	Electric Boat WHE Program
Maintenance Reduction Initiatives	

Break Out Sessions (Panel discussions/Q&A with NCC, activity experts, and other guest presenters.)

- Program Management Interests
- Inspection, Testing, and Certification Interests
- Operations, Rigging, and Safety Interests

Thursday, 16 May 2002
0800 - 1700

NCC In-Service Engineering	Engineering Services Available from Naval Shipyards
Risk-Based Management for Cranes	Wheels and Sheaves
Oil Analysis	Load Measurement Systems
NCC Training	New Crane Procurement
Navy Floating Crane Program	NCC Audits/NAVFAC P-307

On-going NCC safety videos, web-site demonstration, and other Navy WHE resources and program information will be on display in a special area.

General lodging and registration information is listed on our website, http://ncc.navfac.navy.mil.

MARKING MULTIPLE-LEG SLING ASSEMBLIES

A number of questions have arisen about the marking requirements for multiple-leg sling assemblies. There is a common misunderstanding of NAVFAC P-307, paragraph 14.6, that four-leg sling assemblies must be marked based on the capacity of two legs. It seems the misunderstanding stems from the notion that the terms "sizing" and "rating" are synonymous, which is not true. The current wording is as follows: *"Components in multiple leg sling assemblies shall be sized based on the worst case distribution of loads. For example, slings, shackles, and attachment points in a four-leg assembly for a four-point lift shall be sized based on either pair of diagonally opposing legs carrying the entire load…"* The word "sized," as used in this case, means selected by the user for a four-point lift based on the size/strength of diagonally opposing legs – even if the assembly is *rated* based on the capacity of four legs. So, "rating" is the act of assigning a capacity to gear and "sizing" is the act of selecting gear for a certain lift.

MARKING REQUIREMENTS THAT APPLY TO MULTIPLE-LEG SLING ASSEMBLIES

Equipment Identification

While NAVFAC P-307 doesn't specifically say to mark an equipment identification number on each piece of gear, the need for it is implied by the requirement to maintain test and inspection documentation as stated in paragraph 14.4. There has to be some means to trace each piece of gear to its test and inspection documentation, such as an identification number on the gear and on the documentation. The next edition of NAVFAC P-307 will require unique serial numbers marked on each piece of gear. Marking identification numbers on gear is supposed to be done in a manner that does not affect the strength of the component. Vibra-etching methods and low stress dot-faced stamps are acceptable. Contact the original equipment manufacturer with any questions regarding the type of marking to be used or acceptable marking locations on the gear. Some activities put the equipment identification on a tag attached to the gear. This is not recommended. If the tag is lost, positive identification of the gear is lost and it can no longer be traced to its test and inspection documentation.

Re-Inspection Due Date

NAVFAC P-307, paragraph 14.3, requires an indication of the next inspection date be marked on each piece of gear. Re-inspection is required annually for most slings. (Chain slings in maritime use are inspected quarterly.) Some activities use color coding for this, but color coding is usually not practical for large inventories with multiple users. The re-inspection date is most often placed on the gear by means of a tag since it has to be changed periodically. If the date tag is lost, the gear can be traced to its documentation using the identification number marked on the gear. Activities then place a new date tag on the gear based on the previous inspection date recorded in the documentation.

NAVFAC P-307, paragraph 14.3, requires the rated load be marked on each piece of gear and gives specific directions on how to mark the rated load on multiple leg sling assemblies. It states, *"Multiple-leg sling assemblies shall be marked with the rated load of each leg and the link shall be marked with the maximum load for the sling assembly."* Activities should mark the rated load using one tag attached to the link/ring. The tag must state the rated load for each leg and the rated load for the whole assembly. Each leg does not have to be individually tagged. Deciding what the rated load should be and marking it properly on multiple-leg sling assemblies is confusing. Consider the worst-case distribution of loads when making four-point lifts. This requires sizing slings based on either pair of diagonally opposing legs carrying the entire load. This is often referred to as the four-point lift rule. With a four-leg sling assembly, consider the rated load of only two legs as carrying the load. Some activities choose to rate all their four-leg sling assemblies based on two legs carrying the entire load to account for the four-point lift rule.

When slings are used in non-vertical applications, consider the increased tension due to sling angle. Some activities base the rating on three standard angles, 30, 45, and 60 degrees from horizontal, giving three different capacities on the tag.

Other activities don't allow for either the four-point lift rule or sling angle when deciding a four-leg sling's rated load. At these locations, user personnel, who are trained in these concepts, decide when the four-point lift rule applies and calculate the increased tension due to lift angle accordingly.

The least conservative approach for rating a four-leg, wire rope sling assembly (with inseparable parts) where each leg has a vertical rated load of 1000 pounds is not to take into account the four-point lift rule or increased tension due to sling angle and rate the entire assembly at 4000 pounds. The tag would indicate that the rated load per leg is 1000 pounds and the rated load for the entire assembly is 4000 pounds. This approach would allow the sling assembly to be used for the maximum weight possible based on the configuration. It could be used to lift two separate loads simultaneously with two legs attached to each load. If the maximum resulting sling angle is 75 degrees from horizontal, each load, including the weight of shackles, could weigh as much as 1931 pounds (a combined load of 3862 pounds) without overloading the sling assembly. Worst case distribution of loads is not an issue in this configuration. The load test values for this sling would be 1500 pounds per leg and 6000 pounds for the master link.

A more conservative approach for rating the same sling assembly is to consider the rated load of only two legs to account for the four-point lift rule, 2000 pounds. The tag would indicate that the rated load per leg is 1000 pounds and the rated load for the entire assembly is 2000 pounds. User personnel would be relieved of the responsibility of dividing the rated load by two when using this sling for a four-point lift, but they also would not be able to make the lift described in the previous paragraph. They would need to determine the sling angle and calculate the increased tension in the legs. The load test values for this sling would be 1500 pounds per leg and 3000 pounds for the master link.

Taking this conservative approach a step further, the rated load could be based on two legs and the three standard angles, 30, 45, and 60 degrees from horizontal. The tag would indicate that the rated load per leg is 1000 pounds and the rated load for the entire assembly at 30 degrees is 1000 pounds, at 45 degrees is 1414 pounds; and at 60 degrees is 1732 pounds. This relieves the using personnel of dividing by two and doing sling angle calculations. They would need to determine the angle. If the actual angle falls between two of the standard angles, they must use the smaller angle when deciding on the appropriate sling.

All the examples used above for rating and marking slings are in compliance with NAVFAC P-307. The most flexible is the least conservative. It requires using personnel to accurately apply their training. Each activity needs to decide what approach will work best for them and ensure their using personnel are trained to understand what the markings mean and what is expected of them.

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. CSA-103, *Possible Malfunction of Disconnect Switches*; EDM-048, *Failed Stainless Steel Hydraulic Brake Line on a Portal Crane Main Hoist*, and EDM-049, *Two Crane Hoist Brake Failures Due to Personnel Error*, were recently issued.

FIRST QUARTER FY02 ACCIDENT REPORT

The Navy Crane Center (NCC) disseminates crane accident lessons learned to prevent repeat accidents and improve overall crane safety. NAVFAC P-307 requires commands to submit to the Navy Crane Center (NCC) a final, complete accident report (including corrective/preventive actions) within 30 days of an accident involving Navy-owned weight handling equipment, regardless of severity or type. In addition, contracting officers are required to forward to NCC and the host activity reports of all contractor accidents regardless of severity. For the first quarter of FY02, 45 Navy WHE accidents were reported. Serious accidents included two injuries, four dropped loads, and four overloads.

INJURIES

Accident: An untrained operator was using a monorail hoist to position a 400-pound compressor base onto the "S" hooks of a paint cart for spray painting. The operator was operating the down button on the pendant control with one hand while using the other hand to push the compressor base onto the "S" hooks. The cart's wheels were not locked. This made the transfer maneuver even more difficult, because the operator needed to stabilize the "S" hooks while the weight of the load was being transferred. Once the weight of the compressor was transferred to the "S" hooks, one hook started to turn and pinched the operator's finger.
Lessons Learned: Operators of category 3 cranes must be trained and qualified. When loads are to be hoisted and maneuvered such as in this operation, the operator should request assistance of a rigger or other qualified person. Performing one task at a time will minimize the possibility of having a crane accident.

Accident: Two people were injured when a bridge crane operator who was assisting another worker to install a shaft alignment fixture onto a helicopter inadvertently depressed the crane's pendant travel button. This caused part of the helicopter to lift and list to one side. Two other personnel working on the helicopter were forced to jump and both sustained minor injuries.
Lessons Learned: Crane operators must ensure that crane controls cannot be accidentally engaged while performing other tasks. The operator's primary responsibility is control of the crane while it is attached to a load. If additional work is required while a load is attached to the crane, assistance should be requested.

DROPPED LOADS

Accident: A 4,000-pound capacity bridge crane was being used to move a turbine simulator assembly from a balancing machine to a cart. As the load was lifted, it became unbalanced and the web sling slid off the polished shaft, which caused the turbine to fall to the shop floor.
Lessons Learned: When hoisting loads with smooth or polished surfaces, use extra precautions to properly secure the load. If the load is constructed in a manner that creates a difficult rigging arrangement, engineering assistance should be requested.

Accident: A second shift crane team was using a portal crane to re-install a mast-fairing hoist cylinder when the inner mast assembly telescoped out from the outer mast and slid out. The first shift had turned the task over to the second shift with the understanding that the mast was ready to be installed. Investigation revealed that the mechanism to prevent the mast from telescoping was never installed by the first shift.
Lessons Learned: When a lift operation is transferred to a different crane team, each team should thoroughly review all requirements of the lift procedure to ensure all steps are properly followed.

Accident: While operators were performing a travel test on a monorail system, the monorail beam buckled and the test load dropped to the floor. The monorail beam had been modified, apparently without an adequate engineering evaluation. This section of rail was used infrequently and had not been load tested.
Lesson Learned: Alterations to load bearing components must be properly engineered and approved by NCC. Test directors must ensure all required tests are performed. Also, ensure loads are lifted only high enough to perform the required tests and stand clear of test loads to the maximum extent possible.

OVERLOADS

Accident: A mobile crane was overloaded during a load test when the incorrect test weight was used. The test director applied a load of 132 percent of the crane's rated capacity instead of 110 (+5, -0) percent. In addition, the test director, who was a private, third-party certifier, failed to perform other tests required for the crane's certification. Finally, this overload was not recognized as a WHE accident by the activity.
Lesson Learned: Test directors must accurately calculate required test loads, particularly for mobile cranes where even small overloads can cause tipping of the crane. Proper activity oversight of contractor-provided services is essential to ensure all requirements of NAVFAC P-307 are met.

Accident: A crane accident prevention team member was walking through a building and noticed that a jib crane hook's safety latch was sprung from its normal operating position. The hook throat opening had spread and the load chain had elongated beyond the recorded measurement taken at the time of certification. The crane was in operation at the time.
Lesson Learned: Shop crane operators must inspect cranes prior to use and report any abnormalities to the supervisor.

Accident: An underwater component was being raised from its submerged location onto a platform deck. A category 4 crane was used initially to raise the component's retrieval buoy. The retrieval line below the buoy was then transferred to a deck winch. The deck winch stalled as it was hoisting the component. At this time, a portable load indicating device (LID) was rigged between the crane hook and the retrieval line. The load was transferred back to the crane and the LID indicated that the weight was 4,220 pounds. The rated capacity of the crane at its configuration was only 3,000 pounds. Prior to the lift, the crane operator asked the rigger the weight of the load and he was told 2,100 pounds. The lift's task leader knew the correct weight of the load but did not pass that information on to the rest of the crane team.
Lessons Learned: Weights of loads should be known and not casually estimated. All crane team members should be informed of the weight prior to the lift. When a problem arises, ensure the corrective action will not result in another problem. In this case, a dynamometer was attached to the crane, but the load applied to the crane was allowed to exceed the crane's capacity. NAVFAC P-307 requires that lifts of submerged or partially submerged objects be treated as complex lifts. This would require that the crane team have a standard written instruction or procedure prior to commencing with the hoisting operation.

Accident: A crane team overloaded a 10,000-pound capacity bridge crane while attempting to remove the ram section of a shear machine. The team did not follow the OEM's procedures for removing the ram and ended up lifting the entire machine, which was bolted to a bedplate. A nylon web sling parted (the eye of the sling flew 30 feet) and the machine dropped to the floor. Also, one of the crane team members removed the damaged sling from the accident scene prior to the investigation. Thus, the accident scene was not preserved as required.
Lessons Learned: Disassembly of machines must follow OEM directions. Activities should also highlight to shop personnel the proper procedures to take after an accident occurs.

SPECIAL INTEREST ACCIDENT

Accident: A crane operator was repositioning a mobile crane between lifts when the crane's headache ball came in contact with an 8,000-volt overhead electrical power line. The lifts involved repositioning Conex boxes that were in the vicinity of overhead electrical lines. During the pre-lift brief, the crane team discussed the lifting procedure and was cautioned about the overhead power lines. The crane team failed to follow the activity's standard operating procedure that required them to maintain specific clearances between the crane and the power lines. The rigger-in-charge was unclear on the minimum separation distances applicable to working near energized lines.
Lesson Learned: This accident could have been much worse. When working in the vicinity of overhead power lines, the preferred alternative is to de-energize the lines. This should be the first question asked at the pre-lift brief. If it is not possible to de-energize the lines, follow the rules of NAVFAC P-307, paragraph 10.11.1. These rules apply not only to lifting but also to repositioning the crane for additional lifts. One rigger must have as his/her sole responsibility ensuring the safe separation distance is maintained between the crane and the power lines at all times. This person must understand the safe separation distances applicable to specific voltages. Additionally, activities should review where relocatable items are placed. At this activity, Conex boxes are stored directly beneath overhead power lines. This is asking for trouble.

Serious crane accidents are still occurring as noted above, with human error (e.g., inattention to detail) being the primary cause. Weight handling program managers and safety officials are encouraged to consider the potential risk of accidents similar to those highlighted above occurring at your activity and apply the lessons learned to prevent similar accidents. OPNAVINST 3500.39, Operational Risk Management, prescribes methods for assessing hazards and controlling and minimizing risks in hazardous operations. Activities should incorporate these principles into both training and day-to-day weight handling operations.

E-mail submission of accident reports, unplanned occurrences, near misses, and photographs of these events, where possible, is encouraged. Attach a complete and concise situation description, corrective and preventive actions, probable cause and contributing factors, and an assessment of damage. For equipment malfunction or failure, include specific description of the component and the resulting effect or problem caused by malfunction or failure.

P-307 QUESTIONS & INTERPRETATIONS

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

Question: Pre-Use Check of Non-Cab Operated Category 3 Bridge, Wall, and Gantry Cranes. NAVFAC P-307, paragraph 9.2.b, requires a documented monthly pre-use check of non cab-operated category 3 bridge, wall, and gantry cranes. The operator is required to forward the checklist to his or her supervisor at the end of the shift. Our Production Department, conservatively, chooses to have its operators document their pre-use check by shift. To support checks by shift efficiently, a multiple-use checklist remains posted at the crane until the end of the month. The building manager collects the checklists and replaces them with new forms at the end

of each month. Even though the checklists are not submitted to the supervisor by the end of the shift in which they are completed, deficiencies to load bearing, load controlling, or operational safety device components are reported immediately. We feel this process meets the intent of the requirements while supporting our Production shop's conservative work practices with respect to operator's safety inspections.

Request NCC concurrence that our operator's safety inspection process described above is consistent with the intent of section 9 of NAVFAC P-307 and authorize us to submit the completed ODCL at the end of the month.
Answer: NCC concurs.

Question: Shackles Lacking OEM Markings for Safe Working Loads (SWL), Part 1 of 2. Provide guidance on where to obtain SWL information when the SWL is not marked on the shackle.
Answer: The OEM must be contacted for the SWL information. If the OEM cannot be identified, the shackle cannot be used for weight handling operations as required by NAVFAC P-307, paragraph 14.7.1.1.

Question: Shackles Lacking OEM Markings for Safe Working Loads (SWL), Part 2 of 2. Request revision to NAVFAC P-307, paragraph 14.7.1.1, OEM Markings, to include not only OEM markings, but the SWL.
Answer: The next revision to the NAVFAC P-307 requires all newly procured shackles meet the Fed Spec RR-C-271, paragraph 3.5.3.1.6, which states, "Each shackle body shall be permanently and legibly marked in raised or stamped letters on the side of the shackle bow with the identifying manufacturer's name or trademark, shackle size, and the recommended SWL."

Question: Documentation and Retention Requirements for Non-Cab Operated Category 3 Crane Pre-Use Checklists, Part 1 of 3. How often must a documented pre-use check be performed on category 3 bridge, wall, and gantry cranes?
Answer: The minimum requirement is a documented pre-use check once each calendar month, for non-cab operated category 3 bridge, wall, and gantry cranes. However, prior to each use, the operator should perform a pre-use check of the load bearing, load controlling, and operational safety devices. The difference these pre-use checks are not required to be documented.

Question: Documentation and Retention Requirements for Non-Cab Operated Category 3 Crane Pre-Use Checklists, Part 2 of 3. What are the pre-use requirements for other category 3 cranes?
Answer: Prior to each use, the operator should perform an operational check of the load bearing, load controlling, and operational safety devices. However, this check is not required to be documented.

Question: Documentation and Retention Requirements for Non-Cab Operated Category 3 Crane Pre-Use Checklists, Part 3 of 3. How many pre-use checklists are required to be in the crane history file?
Answer: For cranes that require a documented pre-use check, the current and previous month's checklists shall be retained.

Question: Weight Testing. When performing the NAVFAC P-307, appendix E, paragraph 5.5.1.e, test for hydraulic crane slippage, the crane is set with the boom fully extended and at minimum radius. Larger cranes will have boom deflection, which can be substantial, if you are already boomed up all the way (minimum radius) and have to keep the boom fully extended for the test. How can you correct this condition (increased radius)? Request clarification of which radius (original or actual from deflection) to mark on the load test certificate and which capacity from the load chart to use for the test (actual set up radius capacity or radius capacity from boom deflection).
Answer: The radius recorded on the Certification of Load Test form must coincide with the OEM's load chart. If this radius is not attainable, then maintenance must be performed to define and correct the cause. If after all adjustments have been made, the defined radius still cannot be attained, then you must contact the OEM for any allowable deviation. The OEM's response must be in an official written format and filed in the equipment history jacket with a copy forwarded to the Navy Crane Center for informational purposes.

Question: Definition of Package Hoist. The NAVFAC P-307 will be modified to exclude oil or vibration analysis for "Package Units." What is the definition of "Package Unit"?
Answer: Change 1 to NAVFAC P-307 (expected issue in April 2002) will contain the following definition of Package Hoist: A commercially designed and mass-produced hoist characterized by the motor, gearing, brake(s), and drum contained in a single package often connected by the use of c, d, or p-face flanges. This is in contrast to a "built-up" hoist, which utilizes separate motors, gearboxes, brakes, and drum typically connected by couplings.

Question: Clarification of Load Controlling Components and Wiring. NAVFAC P-307, paragraph 1.4.b, states that crane-mounted electrical power distribution systems are to be treated as load controlling parts. We interpret this to mean load controlling electrical power distribution on a crane begins at the main disconnect. Therefore, all of the components that receive their power from the main disconnect and provide power to move/control the load, including wiring, are considered load controlling. For portal cranes, in addition to power distribution, NAVFAC P-307, paragraph 1.4.b, defines the diesel engine and generator as load controlling. Shore power plugs and cabling leading up to the main disconnect are regarded as part of the power source not part of the crane-mounted power distribution. For bridge cranes, load controlling components start after the main disconnect on the crane. Non-load controlling electrical components are those that conduct electricity to the main disconnect on the crane. Examples of non-load controlling components are span wires/collector wheels up to the main disconnect on bridge cranes. For bridge cranes which do not have a disconnect on the crane, load controlling components begin at the first load controlling relay/contactor.
Answer: NCC partially agrees with your interpretation of NAVFAC P-307, paragraph 1.4.b. Per the Institute of Electrical and Electronics Engineers definition of a distribution system, all conductors on a crane that carry current to the electrical drive motors, at the rated voltage of the motors, form the electrical distribution system. Therefore, NCC interpretation of load controlling parts, as it pertains to electrical power distribution for bridge cranes, includes the runway electrification system collectors and the leads from them and for portal cranes, includes shore power equipment and conductors, but not hotel power equipment and conductors.

SHARE YOUR SUCCESS

We are always in need of articles from the field. Please share your "sea stories" with our editor.

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