THE CRANE CORNER

Weight Handling Equipment Technical Bulletin *32nd Edition Web Version*
http://ncc.navfac.navy.mil *Editor: (610) 595-0905 or DSN 443-0505* *December 2001*

A WORD FROM TOPSIDE

Sam Bevins

Our Navy shore activity weight handling programs have made very good progress in FY01. Activities reported 184 weight handling equipment (WHE) accidents to the Navy Crane Center (NCC). This represents a 27 percent reduction from last year and a 40 percent reduction from our baseline year of FY99. The rate of unsatisfactory cranes found in FY01 audits was 30 percent of the sample selected for inspection. This is a 19 percent reduction from last year and a 36 percent reduction from FY99. These are significant achievements but a strong command focus is needed to continue driving these rates down.

Our quarterly summary reports provide important lessons learned for significant accidents. Ninety-five percent of the accidents were a result of human error. It is very important to thoroughly investigate each accident to determine the root cause. All WHE personnel should be trained in and apply the principles of Operational Risk Management.

There were numerous deficient load bearing and load controlling parts and operational safety devices that caused the audit cranes to be unsatisfactory. Deficient brakes accounted for 33 percent of the unsatisfactory cranes. Also, incomplete or improper load testing accounted for 13 percent. With a strong focus on improving these two areas, we will further drive down the rate of unsatisfactory cranes. To assist activities in improving their weight handling programs, a complete review of FY01 unsatisfactory crane results and other audit findings can be found in our audit report at our web site, http://ncc.navfac.navy.mil/.

Operational Risk Management
5-Step Process

- Identify Hazards
- Assess Hazards
- Make Risk Decisions
- Implement Controls
- Supervise (Watch for Changes)

Inside This Issue

This year's WHE accident and audit unsatisfactory crane reductions reflect a heightened awareness of WHE operational hazards, improved skills, and knowledge of program requirements. But we can and must do better. Each WHE accident and unsatisfactory crane diminishes our support to the fleet. A safe and reliable Navy weight handling program is an essential enabler for fleet readiness. Commanding officers of naval shore activities are strongly encouraged to intensify their efforts to continue these positive improvement trends.

FY01 AUDIT SUMMARY

During FY01, audit teams completed 131 WHE program audits. Our responsibilities include auditing all activity WHE programs every 2 years at a minimum and suspending unsafe crane operations, if necessary, at any activity.

This year's audit findings and summary data indicate continued incremental program improvement. For those few activities that have failed to improve, additional claimant intervention may be required. As a result of completion of the second audit cycle, and completion by most activity WHE personnel of the NCC NAVFAC P-307 WHE training program, all activities have an increased awareness of program requirements. However, additional effort is required to ensure completion of continuing and necessary on-the-job and advanced specialized training requirements during FY02 and consistent program execution to attain and maintain full compliance with NAVFAC P-307.

Percent of Unsatisfactory Cranes			
Activity Type	**FY99**	**FY00**	**FY01**
Shipyards (SPS Cranes)	19	19	21
Shipyards (GPS Cranes)	18	16	13
Public Works Centers	35	34	28
Surface Warfare Centers	48	29	36
Air Stations	66	42	42
SIMA's	57	50	55
All Other Activities	51	36	28

EQUIPMENT CONDITION

In FY01, the audit teams sample inspected/load tested 556 cranes out of a total inventory of 5,495 for the activities visited. The number of cranes determined to be unsatisfactory by the audit teams continued on a favorable downward trend. Of all cranes sampled, 30 percent were unsatisfactory. By contrast, 37 percent overall were unsatisfactory in FY00 and 47 percent in FY99.

In general, the total number and severity of the deficient conditions found by the audit teams decreased over the last audit cycle. As in the previous two fiscal years, brake/clutch deficiencies continued to be the most prevalent unsatisfactory condition the audit teams found, accounting for 33 percent of all deficient conditions resulting in unsatisfactory cranes (down from 41 percent). Most (25 percent) of the brake/clutch deficiencies were due to settings out of approved specifications. Brakes out of adjustment were found at nearly one-fourth of all the activities audited and brakes on the hoist function were found deficient more frequently than on the travel (bridge/trolley) function. Some of the brakes found out of adjustment were due to either no adjustment range being established by engineering or the established range being too restrictive. Eight percent were due to mechanical deficiencies and inoperative brakes. Examples were brake drums and frictions covered in oil and grease, brakes not opening, shoes misaligned to drum, inoperative brakes, brakes incorrectly assembled, and brakes stuck in open position.

Load test related deficiencies remained as the next largest category of unsatisfactory cranes. Incorrect test procedures accounted for 13 percent. Examples were test directors not following NAVFAC P-307 appendix E test procedures, mobile cranes not tested for stability in all applicable configurations, and mechanical load brakes not tested. Another positive indicator of program compliance was a reduction from last year in the number of audit sample cranes that failed the load tests, i.e., less than 2 percent as compared to 4 percent during FY00.

Control system deficiencies (8 percent), various mechanical component deficiencies (5 percent), wire rope deficiencies (5 percent), and deficient limit switches (4.5 percent) were other common significant reasons for unsatisfactory cranes.

Other deficiencies of consequence found during audit crane inspections included: outrigger bent (category 4 crane), engine control (start-stop) circuit in the operators cab disabled with the circuit temporarily rewired to the

crane carrier, boom hoist primary upper limit switch failed to operate, cracked weld in boom base section, boom extension cables rusted and pitted requiring replacement, damaged boom member, and hoist wire rope with the core protruding through the strands.

PROGRAM COMPLIANCE

WHE programs complied with NAVFAC P-307 standards to varying degrees. Significant common findings are listed below in the order of most prevalent and widespread to least.

RIGGING

Gear not properly marked per NAVFAC P-307.
Uncertified gear.
Deficient rigging gear in service.
Reinspection due dates expired.
Unsafe rigging practices.
Incorrect capacities marked on gear.
Mismatched rigging gear.
Improper load test/slings tested at wrong test load percentage.

PROGRAM MANAGEMENT

No implementing instructions, instructions not current/complete.
No enforcement of the control/surveillance of contractor cranes.
Certifying officials, inspectors, test directors, and licensing officials not designated.
Mobile crane limit switch bypass control instructions not posted in crane cab.
Adverse weather condition notices not developed or not posted in operator's cab.
No tracking system for Crane Safety Advisories.

INSPECTION AND CERTIFICATION

Crane condition inspection report and maintenance inspection specification reports not filled out correctly.
Incorrect test paragraph numbers shown on load test certification form/missing test paragraphs.
Incorrect NDT method used for crane hooks.
Brake specification sheets not completed.
Test directors not following NAVFAC P-307, appendix E test procedures.
Mobile cranes not tested in all applicable configurations.
Cranes tested with incorrect test load.
Elevated bridge crane rails not certified per NAVFACINST 11230.1.
Hook NDT personnel not qualified.
Mechanical load brakes not tested.
Specification data sheets not developed for specific cranes.
Repair documents do not adequately describe the work done.

CRANE OPERATIONS

Operator license files lack essential documentation.
Operator's Daily Checklists (ODCL) not filled out properly.
Category 3 crane operators lack training.
Unlicensed crane operators.
Expired license.
Complex lifts not identified/handled as such.

CRANE SAFETY/ACCIDENTS

Accidents not reported to NCC.
Investigations not thorough.
Lack of compliance with lock out/tag out procedures.

ENGINEERING

Changes made without alteration development.
Alterations were locally approved that should have been NCC approved.
Locally approved alterations not submitted to NCC for information.
Repair of equipment deferred without justification.

DEFICIENT CONDITIONS ON CRANES INSPECTED
(CATEGORIZED MOST TO LEAST)

1. Brakes/clutches out of adjustment.
2. Test procedures - not all components tested (e.g., mechanical load brakes), incorrect test load, mobile cranes not tested in all configurations required by P-307.
3. Deficiencies to brake/clutch (brake drums and frictions covered in oil and grease, brake not opening, shoes misaligned to drum, inoperative brakes, brake incorrectly assembled, brake stuck in open position).
4. Controls (hoist circuit incorrectly wired, one travel motor only powered in one direction, emergency stop button inoperative, inoperative contactor).
5. Mechanical miscellaneous (loose couplings, pawl to ratchet misaligned, guide rollers frozen).
6. Wire rope/load chains (worn/damaged wire rope, improper clips/clips incorrectly installed, load chains twisted or installed with weld towards sprocket).
7. Limit switches (inoperable, not adjusted correctly).
8. Corrosion/miscellaneous structural (cracks in carrier frames and outrigger beams).
9. Unauthorized alterations (not documented/identified).
10. Booms (excessive side deflection, worn wear pads, bent lacing).
11. Loose wires/miscellaneous electrical (control circuits improperly wired, wiring not connected properly, incorrect/oversized fuses).
12. Structural bolts (loose, missing).
13. Failed load test (boom deflection, load brake failure, outrigger cylinder leak down, won't lift/hold load).
14. Hydraulic leaks.
15. Mechanical bolts (loose, missing).
16. Load moment indicators (not tested, inoperable, out of calibration).
17. Sheaves (excessive wear, not lubricated, frozen sheave).

HAVE YOU HEARD ABOUT?

Shaft lip seals are commonly used to retain lubricant (oil or grease) in a cavity while also preventing outside contaminants from entering the cavity. These outside contaminants, dirt or other abrasive particles, tend to collect and become lodged under the lips of the shaft seals. With the presence of these abrasive particles, the seal lips rubbing against the rotating shafts can cut grooves into the shafting. These grooves can cause leakage through the seal lip/shaft interfaces. The leakage can result in loss of lubrication with resulting damage to the internal machinery as well as an external cleanliness problem.

Corrective action commonly consists of re-metalizing or regrinding of the worn shaft. Regrinding generally requires disassembly and removal of the shaft. This can be costly and labor intensive. In addition, many regrinding and refinishing techniques used do not produce a surface that can be properly sealed.

A shaft repair kit is available for fixing worn shafts in place. This repair kit consists of a flanged wear sleeve and an installation tool. The wear sleeve is available in both Type 304 stainless steel and titanium nitrided Type 304 stainless steel. The Type 304 stainless steel wear sleeve has a hardness of HRb 95. The titanium nitrided Type 304 stainless steel wear sleeve has a surface hardness of 80-85 HRc. Both versions of the wear sleeve have a surface roughness height rating of 10-20 micro-inches and are resistant to corrosion. While both wear sleeves have good abrasion resistance properties, the titanium nitrided version is superior in this area due to its substantially higher hardness. The titanium nitrided wear sleeve was specifically developed for use with the more abrasive seal materials, such as Teflon. Both versions of the wear sleeve have thin walls (0.010-0.012 inches) allowing for use of the original seal size. The sleeves are available in sizes from 0.5 to 8.0 inches in diameter and in widths up to approximately 1.0 inch.

The wear sleeve is assembled onto the shaft with the flanged end going on first. The installation tool fits over the wear sleeve and is tapped against the wear sleeve flange to locate the sleeve over the seal's worn surface. Generally, heat is not required to assemble the wear sleeve onto the shaft. The flange has a circumferential notch, allowing for removal from the wear sleeve after assembly by cutting, as necessary.

The selection of wear sleeve size is based on the measured diameter of the shaft, taken in the unworn area. It is preferred that the wear sleeve bore/shaft diameter interface be a press-fit to prevent sliding or spinning. In addition, it is recommended that a liquid metal product be applied to the worn shaft surface just prior to assembling the wear sleeve on the shaft. This process is intended to fill the shaft groove and eliminate leakage paths between the worn shaft surface and sleeve bore. ■

WEIGHT HANDLING EQUIPMENT CONFERENCE

The Navy Crane Center (NCC) will host a Weight Handling Equipment (WHE) Conference 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.

Some of the topics envisioned for presentation include historical review of Navy WHE accidents, human factors in WHE accidents, shipyard accident prevention initiatives, oil analysis, mobile crane acquisition, and NCC updates. Working group sessions are also planned with discussions focused on specific areas that may include safe rigging practices, wire rope inspections, certification issues, safe operating practices, accident investigation techniques, and engineering issues. ■

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. One CSA and one EDM were issued this quarter.

CSA-102: Two-Block Accident Prevention.
EDM-47: Possible Overload of the Casters on Spanco, Inc. Standard Commercial Duty 3-Ton T-Series Adjustable Gantry.

NAVFAC P-307 ADVANCE CHANGE NOTICE

NAVFAC P-307, paragraph 1.7.2.f, currently requires that contracts include the requirement for contractors to provide the contracting officer reports of all weight handling equipment (WHE) accidents as defined in section 12. Paragraph 1.7.2.1 currently requires contracting officers to forward reports of serious contractor accidents, such as fatalities, overturned cranes, and major damage to NCC and the host activity.

Effective immediately, contracting officers are required to forward reports of all contractor WHE accidents, regardless of severity, to NCC and the host activity.

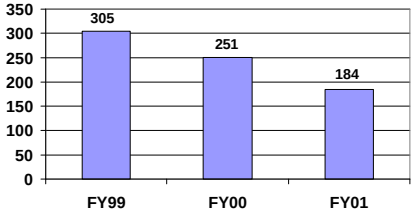
Host activity commanders/commanding officers are requested to ensure that contracting officers at your activities are aware of this requirement.

FOURTH QUARTER FY01 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 fourth quarter of FY01, 44 Navy WHE accidents were reported. Serious accidents this quarter included three injuries, five dropped loads, three overloads and two two-blockings. A serious safety violation is also included in this article. Two of the injuries could have been fatal.

Number Accidents Reported



Accident rate is headed in the right direction. Your continued efforts are required to maintain this positive trend.

INJURIES

Accident: An electrician conducting whip hoist voltage checks on a portal crane was injured when his test leads contacted each other while the other ends were connected to a 460 volts DC energized circuit. The electrician suffered burns to his hands. The electrician disconnected the leads to his meter prior to de-energizing the circuit when he completed his testing.
Lessons Learned: Operational Risk Management did not take place in this series of events. Accidents can happen to even the most experienced person. The electrician knew the circuit was energized. It was a simple mental lapse that could have been disastrous. There were contributing factors. The work directions were unclear. The engineers assumed that the voltage checks would be made by reading the volt meter on the exterior of the panel. The maintenance personnel assumed they were to take the readings directly from the energized motor leads. Unambiguous work directions, pre-job safety analysis, and attention to the job at hand would have prevented this accident.

Accident: A container handling gantry crane was traveling to place a container on a tractor trailer. A warehouse worker had positioned himself between the crane and the crane stop with his back toward the crane. When the rigger noticed that the crane was about to hit the warehouse worker, the rigger radioed the crane operator to reverse direction. The crane operator immediately changed the direction of crane's travel, but this could not prevent the crane from striking the warehouse worker and injuring him. The crane was being operated with both south side travel alarms not working and the alarms on the north side of the crane had been altered to partially muffle their sound.
Lessons Learned: Personnel must be kept clear of traveling cranes. Travel alarms are essential devices. They must be loud enough to be heard above ambient noise levels. If they are not working properly, alternate safety precautions, such as crane walkers, are required.

Accident: While a mobile crane was hoisting a 6,000-pound anchor, a section of the anchor, the anti-fouling bar, rotated downward striking the rigger, bruising his wrist and shoulder.
Lesson Learned: Prior to lifting loads, all load parts and components must be checked to verify that they have been secured. In addition, personnel should be mindful of sudden movements of the load and stand clear of the load should this occur.

DROPPED LOADS

Accident: A portal crane was rotating and lowering a wooden box of transducers weighing approximately 7,300 pounds. The crane operator failed to stop lowering the load after the stop signal was given. The load continued to lower until it got hung up on the corner of another transducer box and started to tilt. This caused the transducers to shift and the box to fail, resulting in the box flipping over and the contents falling to the work platform.
Lessons Learned: Operators must follow the directions of the signal person. Do not act in anticipation of a command or signal.

Accident: A mobile crane was utilized to lift a forklift weighing approximately 14,500 pounds. The forklift was rigged with nylon web slings in a basket hitch at the front and rear. This method was used because the forklift had no defined or engineered lifting points. Rubber matting was used for chafing protection for the front sling but cardboard was used for the rear sling since additional rubber matting was not readily available. When the crane hoisted the load, the rear sling parted and the rear section of the forklift fell approximately 4 feet.
Lessons Learned: Riggers should select chafing material that will provide the maximum amount of protection for the slings being used. Take the time to do the job safely.

Accident: A mobile crane was hoisting a load weighing 4000 pounds when the outside board of the wooden pallet broke. This caused the load to fall approximately 8 feet to the ground.

Accident: A mobile crane was hoisting a load weighing 700 pounds when the wooden pallet that supported the load broke. This caused the load to become unstable and fall into the water. The rigger did not use pallet bars as required by the activity's instruction.
Lessons Learned: Strict adherence to prescribed lifting and rigging procedure is essential. Additionally, prior to lifting any palleted loads, pallets should be evaluated for structural soundness.

Accident: A mobile crane was hoisting a load weighing 250 pounds when the load, which was improperly secured, slipped from the rigging gear and fell approximately 15 feet to the pier.
Lessons Learned: Riggers must verify that loads and lifting attachments are properly secured.

OVERLOADS

Accident: A contractor overloaded a Navy-owned one-half ton capacity bridge crane while installing new building parts. Also, the operator of the crane was not authorized. Subsequent inspection of the crane found the wire rope was damaged and the overload switch was tripped.
Lessons Learned: Activities should review crane operating requirements with contractors prior to the start of any job. A qualified crane operator should be provided if required.

Accident: Two bridge cranes (80,000 and 30,000 pound capacity) were being used to lift another bridge crane weighing approximately 93,000 pounds when one crane was overloaded. A complex lift plan used on a previous lift by this crane annotated the wrong location for the center of gravity. This error was not revised prior to beginning this lift. Due to the limited lifting clearance, only one load indicating device could be used, which was on the lower capacity crane. A check of the load indicating device during the lift revealed the load on this crane was 9,960 pounds which meant the load on the other crane was 83,040 pounds, exceeding its capacity.
Lessons Learned: Complex lifting plans should be reviewed and all information should be verified for accuracy. When centers of gravity of large, complex shapes must be estimated, there should be adequate reserve in the lifting cranes to allow for errors in the estimate.

Accident: A gantry crane was attempting to hoist a flanged pipe when the wire rope sling parted. The sling was rigged in a basket configuration around the pipe but the pipe was still bolted to its foundation. The operator did not verify that the bolts were removed as required by the lifting procedure.
Lesson Learned: Verify that each step of the lifting procedure is followed prior to hoisting a load.

TWO BLOCKINGS

Accident: A crane operator was extending the boom of a 70-ton capacity mobile crane for the purpose of greasing the boom slides when a bee flew in through the open cab window. The operator was attempting to swat the bee when he inadvertently engaged the foot pedal control for extending the boom. This caused a two blocking.

Accident: A jib crane was hoisting a load weighing 177 pounds when the air hoist control valve failed causing a two blocking.

SAFETY VIOLATION

A monorail had been tagged out-of-service with a red tag attached to the monorail's circuit breaker. A public works inspector noticed that the tag had been removed and the monorail had been operated. Also, the wire rope was damaged from mis-reeving due to a probable side loading. The inspector then applied another out-of-service tag. Three weeks later, the inspector again found that the tag had been removed and the monorail had been operated. This time the wire rope was found properly reeved on the drum.

Building managers, shop managers, and tenant command managers must understand the necessity to strictly control the operation of weight handling equipment assigned to them. Serious and repeated safety violations such as this may warrant disciplinary action.

The accident rate is headed in the right direction but more improvement is needed. Serious crane accidents are still occurring as noted above and human error (e.g., inattention to detail) is 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.

Last year NCC distributed seven crane accident prevention lessons learned videos to assist activities in raising the level of safety awareness. These videos provide a very useful mechanism for emphasizing the impact that the human element can have on safe weight handling operations.

P-307 QUESTIONS & INTERPRETATIONS

The questions and interpretations listed below are based on crane program issues that arise 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: Clarification of Inspection Requirements for Hoist Equipped with a Pneumatic Brake and Self-Locking Worm. Request permission to deviate from P-307, appendix D, item 12, and not disassemble the hoist pneumatic (holding) brake annually (because hoist gearing acts as a load brake).

Answer: Request is approved. Since the hoist design includes an air brake along with the self-locking worm drive gear arrangement, the air brake is considered a holding brake. In accordance with the inspection requirements of NAVFAC P-307, appendix D, item 12, the hoist brake need only be disassembled at every sixth annual inspection.

Question: Lower Limit Checks During ODCL. NAVFAC P-307, paragraph 9.12, provides requirements to test hoist lower limit switches during performance of ODCL's. These switches are to be tested where it is operationally possible (i.e., the crane is in a location where it can be checked). The latest revision of P-307 added requirements to check hoist lower limits when a crane is subsequently moved to a location where it can be checked if it could not be tested during the ODCL.

Testing of hoist lower limit switches is accomplished to ensure that they will prevent hoist ropes from un-spooling off the drum, potentially causing a dropped load and/or hook block. Typical crane lifts do not require hooks to be lowered near their lower limit switch settings because they are set at minimum radius at the deepest available dry dock. Testing of lower limit switches can be time consuming. For example, the main hoist on our cranes lowers at approximately 13 ft/min in 5th speed point. All but two of our cranes have the ability to put their hooks on the floor of our deepest drydock (at any radii) while maintaining a minimum of two wraps of rope on the hoist drum. For these cranes, testing of the lower limit switches adds no measure of safety and consumes valuable time.

For cranes where it is determined that the hook can be lowered to the bottom of the drydock being worked, at minimum radius while maintaining a minimum two wraps of rope on the hoist drum, request the requirement to test the lower limits be waived.

Answer: The primary purpose of the hook lower limit switch (where provided) is to prevent un-spooling of the wire rope from the drum. As opposed to the boom hoist lower limit switch on luffing boom cranes, where an overload, dropped load, or overturned crane could occur, the consequences of a defective hook hoist lower limit switch on most Navy cranes are much less significant, i.e., un-spooling of the wire rope.

For cranes where the limit switch stops the hook to maintain the requisite number of dead wraps on the drum prior to the hook hitting the floor/ground, the hook hoist lower limit switch shall be checked at each shift where operationally possible, i.e., if the crane is at a location where the limit switch can be checked. Where the limit switch is not checked during the pre-use check, it shall be checked if the crane is subsequently relocated to a location where it can be checked.

For cranes with sufficient wire rope remaining on the drum when the hook hits the floor/ground (i.e., lowest possible level where the crane can operate), the limit switch is technically not necessary and is usually set to limit hook travel to some point above the ground. For this case, the frequency of operational check (other than at the maintenance inspections) should be determined by the activity. ■

CERTIFICATION CHECK SHEET

The certifying official is the individual responsible for ensuring the crane is inspected and tested in accordance with the requirements of NAVFAC P-307 and that the crane is safe to use for its intended purpose. For new certifying officials, the following checklist may be useful as a guide to help ensure that the crane has been properly inspected, repaired if necessary, and tested and it is, in fact, certifiable. Where necessary, ask the test director or inspectors for assistance or clarifying information.

NAVFAC P-307 requires that the following documents be submitted to the certifying official:

- The Maintenance Inspection Specification and Record (MISR) form found in NAVFAC P-307, appendix C, or the Annual Maintenance Inspection Specification and Record (AMISR) form found in appendix D as appropriate. These forms are used to document that the crane has been properly inspected.
- The Crane Condition Inspection Record (CCIR) form found in NAVFAC P-307, figure 3-3.
- The Certification of Load Test and Condition Inspection form found in NAVFAC P-307, figure 3-1.

MISR & AMISR REVIEW

1. Are the information blocks annotated as required at the top of each sheet?

2. Are all inspection blocks marked satisfactory (S), unsatisfactory (U), corrected (C), or not applicable (NA)?

3. If an inspection block is marked U, then either the item must be repaired or the deficiency deferred.

   If the item is repaired, is it also marked C?
   Is there an adequate description of the unsatisfactory item on the unsatisfactory items sheet (NAVFAC P-307, pages C-17 or D-13 as applicable)?
   Is the shop repair order (SRO) number listed?
   Is the verification of correction column signed and dated for each item?
   If the item is being deferred, is the SRO block marked with a D? Is engineering justification provided?

4. Review any deferred items to ensure that the deferral will not affect the safe operation of the crane.

5. Are wire rope dimensional measurements and chain length measurements recorded in the remarks block?

6. Has the "systems inspected" column been marked to identify multiple components as applicable (such as main hoist, boom hoist, or whip hoist) as required by NAVFAC P-307, sections C and D, note 8 (pages C-1 and D-1)?

7. Are brake data measurements recorded in the brake data sheets (pages C-18 or D-14)? Do the actual measurements comply with the required settings?

Are the OEM minimum and maximum setting specifications recorded in the Min and Max columns? If OEM criterion is not available, has approval been obtained as required by NAVFAC P-307, paragraph 4.4.4?

8. For category 1 cranes (and category 4 cranes if applicable), have NAVFAC P-307, appendix C, blocks 24, 25a, 25b, 26, and 27b, been marked indicating if disassembly was performed?

9. For category 1 cranes (and category 4 cranes if applicable), has NAVFAC P-307, appendix C, block 28, been marked indicating if coupling alignment was performed or when it is due?

10. For category 1 cranes (and category 4 cranes if applicable), has NAVFAC P-307, appendix C, block 29b, been marked indicating the method of internal gear inspection (i.e., oil or vibration analysis or visual inspection)?

11. For category 2 and 3 cranes, has NAVFAC P-307, appendix D, block 7, been marked indicating if coupling alignment was performed or when it is due?

12. For category 2 and 3 cranes, has NAVFAC P-307, appendix D, block 8b, been marked indicating the method of internal gear inspection (i.e., oil or vibration analysis or visual inspection)?

13. For category 2 and 3 cranes, have NAVFAC P-307, appendix D, blocks 10, 10a, 11, 12, 13a, 3b, and 13c, been marked indicating if disassembly was performed?

14. Have all repairs identified on the MISR or AMISR that meet the criteria for a crane alteration been approved locally or by NCC as required by NAVFAC P-307, section 4.

15. Have the mechanical and electrical inspectors signed and dated the last sheet signifying completion of the inspection (pages C-17 and D-13)?

CCIR REVIEW

See NAVFAC P-307, section 3, for additional information.

1. Are the information blocks annotated with the required information at the top of the first sheet?

2. Is each inspection block marked as satisfactory (S), unsatisfactory (U), or not applicable (NA)? Note: Initials or check marks only are not allowed since the column headings are before (B), during (D), and after (A).

3. Is the inspector's initial column initialed for each item?

4. If a block is marked U, is a description of the unsatisfactory condition noted in the remarks section of the form? If the item is not a major deficiency, engineering justification for the deferral is required.

5. In the event that major deficiencies are identified by these inspections, the deficiencies shall be corrected prior to starting or completing the load test. If this is the case, are corrective actions properly documented?

6. If a major deficiency is found after the load test, it shall be corrected and a selective load test shall be performed to test the component(s) corrected. When a selective load test is performed, a condition inspection shall be performed on all items in the CCIR that experienced greater than normal loading to ensure that the load test has not caused any damage. A record of this retest shall be recorded in the remarks portion of the CCIR. An additional CCIR pertaining to the selective load test shall be provided to the certifying official.

7. Is the method for testing the load brake described in the remarks section of the CCIR as required by NAVFAC P-307, appendix E, paragraphs 6.2.1d, note 1, and 7.2.1c, note 1? Note: If the remarks section is not used, a detailed written procedure must be developed.

8. Are the signature blocks at the bottom of the form signed and dated by the inspector and test director signifying completion?

CERTIFICATION OF LOAD TEST AND CONDITION INSPECTION REVIEW

See NAVFAC P-307, section 3, for additional information.

1. Are the information blocks annotated with the required information at the top of each sheet?

2. If the certified capacity is different from the OEM capacity, is the reason explained in the remarks section?

3. Is the appropriate test load percentage used in the calculation of test weights, 110 percent for category 1 and 4 cranes, (except 125 percent for portals, floaters, and derricks) and 125 percent for category 2 and 3 cranes?

4. Is the supplement for mobile cranes used (NAVFAC P-307, figure 3-2) and are all configurations identified?

Note: The information required to verify questions 5 and 6 below are not required to be included on the certification form. The questions are provided for information should the certifying official feel the need for more in-depth document review.

5. For mobile cranes, is the actual test load (in pounds) based on the combination of test weights, rigging, and specified crane component weights (i.e., hooks, blocks, ancillary devices, etc.)?
6. Does the test load in pounds include the rigging gear?

7. Are all appropriate test paragraphs of NAVFAC P-307, appendix E, listed (including all applicable subparagraphs), including any special requirements specified for a particular crane by the OEM or activity engineering? Note: This is a common failure and the test director must know the configuration of the crane (i.e., does the crane have a load brake). It is not intended the certifying official have in-depth knowledge of each crane to personally verify the appropriate test paragraphs and additional special requirements, but that the certifying official understand that the test director must have that in-depth knowledge.

8. Are the hook tram measurements listed including the base measurement?

9. Are the annual certifications since the last hook NDT listed?

10. Is the form signed and dated by the test inspectors and test director? Are they designated in writing as such?

11. The form can now be signed and dated by the certifying official.

12. After signing and dating the certification, annotate the certification expiration date. This will be one year minus one day from the date the certification is signed.

SRO OR OTHER APPROPRIATE WORK DOCUMENT REVIEW

The certifying official is not required to review work documents. This information is provided to aid the certifying official if a spot check of work documents is desired. See NAVFAC P-307, section 2, for additional information.

1. Are the information blocks annotated with the required information?
2. Does the SRO clearly describe the work performed?
3. Are replacement parts listed?
4. Are appropriate test requirements included?
5. Are the approval and completion blocks signed and dated?

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MESSAGE ADDRESS CHANGE
NAVY CRANE CENTER

The plain language address for the Navy Crane Center has changed to NAVCRANECEN LESTER PA.

NAVY CRANE CENTER
DIRECTOR
NAVY CRANE CENTER
10 INDUSTRIAL HWY MS 82
LESTER PA 19113-2090

OFFICE HOURS: MON-FRI 0630-1730

PHONE: DSN 443-0505
COMMERCIAL (610) 595-0505

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