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Inside this issue:

A WORD FROM TOPSIDE

Tim Blanton

Weight handling program maturity at Navy shore-based activities continues to evolve. An increased focus on program management has resulted in a more self-critical approach to maintenance and operations and improved self-assessment through use of effective monitor programs. After years of stressing the importance of self-monitoring (or surveillance), and acceptance by activities to embrace this concept, we included monitor program requirements in the most recent update (June 2016) to NAVFAC P-307. Your efforts have resulted in continued reduction and mitigation of risk, while improving lifting and handling safety. But there is still work to be done in this area.

Navy Crane Center (NCC) Liaison Initiative – As most of you are aware, NCC evaluates activities periodically based on the size and scope of activity weight handling programs. To promote efficiency, multiple activities in a single geographical location (e.g., China Lake, New London, Crane, Monterey) are evaluated during the same week. During the evaluation process, time constraints, particularly at smaller commands, tend to minimize the amount of time that NCC evaluation teams can spend having discussions with activity personnel other than discussing identified deficiencies and violations and during formal in and out-briefs. Also, the evaluation is usually the only time communication with NCC takes place, leaving significant time gaps for smaller activities, with regard to contact with NCC.

For these reasons, and to promote continuous incremental improvement, NCC is implementing a new pilot program, the NCC liaison initiative, which assigns NCC evaluation team members as liaisons with specific activities. Our focus is on activities that are evaluated on less than an annual basis. The goal of this initiative is to promote increased non-evaluation communication between NCC and the weight handling program community. We are establishing an internal goal of communicating twice a year with each activity in an effort to improve working relationships between NCC and weight handling program personnel in a non-confrontational setting outside the evaluation/audit process.

A primary objective of this initiative is to promote a healthy self-critical focus on the foundations of a weight handling program between regularly scheduled evaluations. Additional objectives include establishing a rapport with less-frequently evaluated activities, which can help with reducing barriers, including areas such as losing track of and access to primary points of contact (POCs), particularly for military-run programs, reducing tensions regarding an upcoming evaluation site visit, and providing a conduit for activities seeking helpful guidance. Improved ongoing communications is also intended to promote an activity's submission of minor (no damage) accident reports, as well as near miss and unplanned occurrence reports, which can enhance Navy efforts to drive continued improvements in weight handling safety.

I want to reiterate that the liaison initiative is not meant to be a formal process that follows strict guidelines and requirements. In fact, for this initiative to be successful, it must remain a simple process that encourages frequent communication (twice a year or even more frequently) between the NCC Liaison and the activity's weight handling program POC. This initiative is also not meant to replace required communication between your assigned evaluation team and your activity prior to and following your scheduled evaluation.

I believe this initiative will be of benefit to smaller weight handling programs. As we roll it out, I highly encourage you to provide feedback, so that we can make course corrections or improvements, as necessary.

TIP OF THE SPEAR
FOURTH QUARTER FY18 EVALUATION SUMMARY

Thirty-two of the 34 Navy activity weight handling programs evaluated in the fourth quarter were fully satisfactory; 2 programs were marginally satisfactory. Monitor (observation) program issues continued to dominate evaluation items. Although all but three of these activities have instituted monitor programs and some found worthwhile tangible deficiencies (i.e., those that if left uncorrected could result in a crane or rigging accident), many activities were still finding and documenting very few deficiencies and even fewer tangible deficiencies. In addition, numerous activities that perform maintenance, inspection, and load testing did not include those functions in their monitor programs. The second most common item was unsafe crane and rigging operations observed by the evaluation teams. Activities need to review the types of unsafe practices noted below and start self-identifying, documenting, and correcting similar practices in their monitor programs.

SUMMARY OF PROGRAMS EVALUATED
32 Navy WHE programs were evaluated, and all 32 were marginally satisfactory.

SATISFACTORY CRANES
40 of 42 cranes were satisfactory (95%).

Reasons for Unsatisfactory Cranes.
Primary limit switch failed to activate.
Damaged wiring and insulation in electrical panel.
Hoist brake would not release properly.
Outrigger control function was inoperative.
All hoist control lost after entering lower limit.

EVALUATION ITEMS

Common Evaluation Items (five or more items):

- Lack of monitor program or established program that needs improvement or does not cover all program elements – 13 items.

- Operator's Daily Check Lists/Operator's Monthly Check Lists (ODCLs/OMCLs) and simulated lifts performed incorrectly or nor performed - 10 items.

- Various unsafe crane and rigging operations observed by the evaluation team (side loading, unattended load, standing/walking beneath load, operating without signals, poor signaling, pinch points, slings bunched in hooks, load not balanced, no synthetic sling protection, brakes not checked at start of lift, side loading of shackles, trackwalker out of position, swivel hoist rings not torqued, trolley racked to one side, etc.) – 9 items.

- Operator's Daily Check Lists/Operator's Monthly Check Lists (ODCLs/OMCLs) and simulated lifts performed incorrectly or not performed - 9 items.

- Operators/riggers/inspectors/test directors lacked essential knowledge (recognizing crane accidents, complex lifts, knowing the weight of the load, how to connect special equipment, etc.) – 9 items.

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- Operator license/file discrepancies (no objective quality evidence (OQE) of performance exam, examiner not licensed, no OQE of safety course, no OQE of operation to waive performance test, course not signed by examiner, course improperly graded, corrective lenses not noted, course not graded, licensed for more than 2 years, license not in possession of operator, operating with expired license/training, operating with no license) – 8 items.

- Training issues, including contractor personnel (training not taken, training weak or not effective, refresher training not taken or not taken within three months of license renewal, lack of inspector training, instructor not authorized by NCC, locally required training not taken, training course score less than 80 percent, non-Navy eLearning (NEL) certificates) – 8 items.

- Deficient or worn rigging gear (including noncompliant gear) – 7 items.

- Rigging gear, containers, brows, test weights, etc., not marked properly or marking not understood by riggers (including illegible marking, mismatched components, SPS vs GPS, pin diameter not marked on alternate yarn roundslings) – 5 items.

- Weakness in (or non-existent) activity self-assessments, or self-assessments not acted upon – 5 items.

SUMMARY OF WEIGHT HANDLING EQUIPMENT ACCIDENTS THIRD QUARTER FY18

The purpose of this article is to disseminate and share lessons learned from select shore activity weight handling accidents, near misses, and other unplanned occurrences so that similar events can be avoided and overall safety can be improved.

There was an increase in accidents for the third quarter as 79 Navy weight handling accidents (60 crane and 19 rigging) were reported, as compared to the second quarter when 61 accidents (52 crane and 9 rigging) were reported. The number of significant accidents remained almost steady with 15 (10 crane and 5 rigging) as compared to 14 (13 crane and 1 rigging) the previous quarter. Two of the significant accidents reported were OPNAV class C accidents. Overload accidents are outpacing all other significant accidents (accounting for approximately 67 percent of significant accidents). Contractor crane accidents are down 50 percent from the second quarter as four accidents (three crane and one rigging) were reported and only two contractor near misses were reported. The low number of reported near misses and contractor accidents is concerning due to the large amount of ongoing Navy contractor weight handling operations. On a positive note, none of the reported contractor accidents were significant.

INJURIES

Two injuries (one crane and one rigging) were reported in the third quarter. Both of these accidents resulted in lost workday injuries. A mechanic was injured when the mechanic placed a finger between a fastener and the spud lock receiver on a portal crane while the crane rotated. In the other significant accident, a rigger was injured when the rigger placed a finger in a pinch point during installation of a shipboard ladder. Personnel placing their hands/fingers in pinch points continue to be the leading cause of injuries. This should be a focal point during observations (monitor program) of planning and execution of in-process work.

Lessons Learned: These injuries could have been prevented if detailed pre-job briefs identified roles and responsibilities of personnel (specifically body positioning during any operations that place personnel in pinch points). Additionally, stopping points should be addressed when the plans cannot or are not being followed. It is critical that personnel practice good Operational Risk Management not only for themselves but also their co-workers.

OVER LOADS

Ten overload accidents (six crane and four rigging) were reported. Nine of the accidents involved rigging gear being overloaded and one involved the overload of a crane. A mobile crane was overloaded during offload of a conex box. A special prop lifting fixture failed due to overloading. A chain sling was overloaded during a load test of a bridge crane. Two synthetic slings were overloaded when the stopping point in the lift plans were exceeded. Two wire rope slings were overloaded during a lift of a component. A swivel hoist ring was overloaded during removal of a machine from a dry-dock. A chain hoist and gantry structure were overloaded during load testing. A chain hoist and beam clamp were overloaded during installation of a shipboard valve. Several chain hoists and A-frames were overloaded due to testing to previous NAVFAC P-307 test values. A chain hoist was overloaded during rotation of a boat davit.

Lessons Learned: Many of these accidents could have been avoided if additional time was taken during the planning and execution of the lifts. For example, when weights are not known, a load indicating device may be used along with stopping points to prevent overload of rigging equipment or the crane. Load and test weights identified in procedures should be verified prior to lifting, to include load test values and tolerances meet current NAVFAC P-307 requirements. Activities are encouraged to monitor in-process work to verify requirements are up to date and being followed. Crane teams and riggers should brief the proper gear selection and utilization prior to commencing any work. Attention should be given to sling angles as many of the capacities identified on slings are for vertical lifting only and capacity reduces as the angles change.

DROPPED LOADS

There were three reported dropped load crane accidents. An identification sign fell from an enclosure while being lifted from the ship to the pier. A load slipped off of its support surface and was damaged. A nylon temporary service strap dropped from a vacuum unit being lifted from the dry-dock to the pier.

Lessons Learned: A good pre-lift inspection by the crane team or operator for some category 3 crane operations are essential to identify loose articles that may shift or fall when a component is lifted. Additionally, loads should be rigged such they will not shift within the rigging configuration. Ensure the load is stable and rigging is satisfactory by lifting the load a few inches off of the deck and stopping prior to continuing with the lift.

NEAR MISSES AND UNPLANNED OCCURRENCES

Activities identified and reported 83 near misses (69 crane and 14 rigging) in the third quarter. This was an increase of approximately 35 percent from the second quarter. Unplanned occurrences remained steady as 36 were reported during this quarter. The top three types of deficiencies identified in near misses this quarter were, (1) improper selection and utilization of rigging gear, (2) identification of deficiencies that if not corrected would have resulted in an overload, and (3) improper crane operation (majority of which resulted in mis-spooled cranes). An example of a good crane near miss involved a supervisor stopping the lift of a water tank when it was observed that the tank was still attached to the foundation.

As indicated, there was an increase in reported overloads (10) and overload related near misses (13) during the quarter. A healthy accident triangle would suggest that there should have been many more overload related near misses reported during the period. The triangle data from this specific area of concern resembles more of a straight line (barely one to one ratio). Utilization of a monitor program, documenting near misses and unplanned occurrences, and trending this information for key factors that lead to significant accidents are essential to improve the overall health of our (Navy) weight handling programs. I'm confident with your help we can reduce the potential for significant accidents from occurring.

Friday, 24 August 2018 will be the 24 year observance of the last reported operational fatality of a Navy employee (military or civilian) associated with the Navy's Shore Weight Handling Program. The fatality occurred when a mobile crane's wire rope parted due to two-blocking, which resulted in the headache ball falling and striking the head of a member of our weight handling team. The danger in our trade has not changed over these many years. Every time we perform a job the potential of injury or death still exists. We often think we are invincible because it has not happened in a long time. This is why it is of the utmost importance not to become complacent with the requirements and follow each requirement to the letter.

I encourage you to take the time to review the video at the link: <https://www.navfac.navy.mil/navfac_worldwide/specialty_centers/ncc/about_us/resources/safety_videos.html > entitled 'WHE Program Event Identification and Prevention Triangle Video'. While viewing the video, think about our weight handling team member from 24 years ago. We have the opportunity to prevent major events from happening by focusing our attention to the details of the small anomalies that occur on a day-to-day basis.

Weight handling program managers, supervisors, and safety officials should review the above lessons learned with personnel performing weight handling maintenance, inspection, load testing, rigging, and operations and share lessons learned as necessary.

CRANE SAFETY ADVISORIES 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. A complete list of CSAs and EDMs can be found on the Navy Crane Center's web site.

CSA 231 – WESTMONT PORTAL CRANE DESIGN DEFICIENCY ON ROTATE AND TRAVEL FUNCTIONS

1. BACKGROUND:

A. The purpose of this CSA is to inform activities of a design deficiency on the rotate and travel functions of 60-ton Westmont Portal cranes. An activity recently reported that a Westmont Portal crane rotated in the opposite direction from which it was commanded. Further investigation identified that a failure mode existed in the rotate and travel functions whereby if the single directional control relay failed open or closed the crane would only rotate in one direction regardless of the direction it was commanded. This design deficiency is applicable to all travel and rotate functions on the 60-ton Westmont portal cranes and hoists that utilize Mentor MP drives on the 60-ton Westmont portal cranes.

2. DIRECTION:

A. Until a design repair is developed, tested, and installed, activities with cranes as described in paragraph 1.A, shall immediately curtail operations such that none of the following lifts are performed: lifts governed by Reference A, lifts of higher level radioactive material per References B and C, personnel, constrained or where binding may occur, and complex.

B. Prior to any operations not excluded by paragraph 2.A., with cranes as described in paragraph 1.A, activities shall take appropriate actions to ensure all lift team members are briefed of the operational consequences of the design deficiency, appropriate crane operations required to verify correct movement, understand the actions to be taken in case of improper initial direction of movement, appropriate clearances to maintain in case of improper movement, and any additional safety precautions that are required.

Additionally, activities shall install a placard or caution tag in the operator's cab to indicate that if improper movement is detected the operator shall immediately return the controller to the neutral position, cease operations, and notify appropriate supervision.

C. NAVCRANECEN will be reviewing the design repair via the crane alteration request process and will provide updated information and guidance as a revision of this CSA.

CSA 232 – RECALL OF SQUARE D NEMA 3R SAFETY SWITCHES MANUFACTURED BETWEEN 2014 AND 2018

1. BACKGROUND:

A. The purpose of this CSA is to inform activities of a potential deficiency involving Square D brand general duty 30 & 60A, 120/240-volt, 2-pole and 3-pole NEMA 3R safety switches. Reference (a) is Schneider Electric's recall notification indicating that certain Square D NEMA 3R safety switches may allow the power to stay on when the safety switch handle is in the OFF position posing an electrical hazard to users.

2. DIRECTION:

A. Within the next 30 days, all activities are to review their crane/hoist inventory and spare parts inventory to identify all Square D safety switches with the date code and catalog number identified in paragraph 1.B.

B. For safety switches identified as being part of the recall, activities shall immediately remove cranes/hoist utilizing this equipment from service until appropriate inspections have been performed in accordance with paragraph 1.C and the safety switch is verified as operating satisfactorily.

C. Activities that identify faulty safety switches, shall contact Schneider Electric for a free replacement safety switch and support to install the replacement switch. Schneider Electric can be contacted at phone number 877-672-1953 or http://www.schneider-electric.com/ for more information.

WEIGHT HANDLING TRAINING A ND SAFETY BRIEFS

Weight Handling Training and Safety Briefs (WHTBs and WHSBs) are provided for communication to weight handling personnel. The following briefs were issued during the past quarter.

The briefs are not command-specific and can be used by your activity to increase awareness of potential issues or weaknesses that could result in problems for your weight handling program. They can be provided directly to personnel, posted in appropriate areas at your command as a reminder to those performing weight handling tasks, or used as supplemental information for supervisory use during routine discussions with their employees. When Navy Shore Weight Handling Safety or Training Briefs are issued, they are also posted in the Accident Prevention Info tab on the Navy Crane Center's web site at http://www.navfac.navy.mil/ncc.

Navy Crane Center point of contact for requests to be added to future WHTB distribution is nfsh ncc crane corner@navy.mil.

Navy Shore Weight Handling Training Brief!

Title: Cranes Not Procured by Navy Crane Center

Target Audience: Facilities Engineering Commands, Public Works Departments, User-Activities

Navy Crane Center (NCC) is frequently made aware of cranes that do not comply with Navy crane acquisition and design policy after the cranes have been installed. Late identification of non-compliances typically has a substantial impact to the activity's mission by not having certifiable cranes. In addition, many time these non-compliances require considerable cost and time to bring the cranes into compliance.

Click HERE to view NAVCRANECENINST's
(http://www.navfac.navy.mil/ncc)

Click HERE to view UFGS's
(http://www.wbdg.org/)

- Typically, general purpose service cranes of less than 20,000 pounds capacity are procured by the user-activity or are included in construction contracts. NAVCRANECENINST 11450.1B, Acquisition of Navy Shore Base Weight Handling Equipment, provides rules for cranes not procured by NCC.
- For such cranes, the purchasing activity must use the applicable Unified Facilities Guide Specification (UFGS) and conform to NAVCRANECENINST 11450.2, Design of Navy Shore Weight Handling Equipment.
- Design reviews, inspections, and testing must be accomplished to ensure compliance with the contract specification and that the cranes are certifiable in accordance with NAVFAC P-307.

Acquisition of a proper, complying crane is not a simple process and requires an adequate specification and proper controls to ensure contractors provide the specified equipment.

Notification to NCC as early in the planning stage as possible for help is important as NCC has services available (see NAVCRANECENINST 11450.1B) to help ensure your crane acquisition goes right the first time. Activities are reminded that NCC must be consulted on the allowable configuration for any bridge crane with a span exceeding 40 feet.

19 July 2018 — **Training** — *Navy Crane Center 18-T-05*

Navy Shore Weight Handling Training Brief!

Title: "Electrical Crane Inspector" Course Revision Announcement

Target Audience: Electrical Crane Inspectors, General Crane Inspectors

Updated
Electrical Crane Inspector, NCC-ECI-02,
course is
now available

Online course access information and descriptions are available at:
http://www.navfac.navy.mil/ncc
via the Training link

Use the Navy eLearning (NeL) direct link:
https://learning.nel.navy.mil
to access
NAVFAC P-307 online courses

A new version of the NAVFAC P-307 Electrical Crane Inspector training course, NCC-ECI-02, is now available on Navy eLearning (NeL). This revision updated information to reflect current requirements. NCC-ECI-02 replaces NCC-ECI-01. Personnel currently enrolled in NCC-ECI-01 should withdraw and enroll in NCC-ECI-02. NCC-ECI-01 is retired.

The NAVFAC P-307 Electrical Crane Inspector course is required training for electrical inspectors of Navy shore-based cranes. Current electrical crane inspectors will want to review this material to update their knowledge and familiarize themselves with the latest information

- TARGET AUDIENCE: Electrical and general crane inspectors.
- SYNOPSIS: Electrical Crane Inspector training is designed to acquaint electrical crane inspectors with Navy requirements for the safe inspection of electrical components on Navy cranes and provide a knowledge base on which to build upon with on-the-job experience. At the end of this lesson, you will be able to identify areas of concern associated with electrical inspection and NAVFAC P-307 electrical inspection requirements.
- PREREQUISITE: Prior to taking NCC-ECI-02, electrical crane inspectors must complete the NAVFAC P-307 Crane Electrician, NCC-CE-02, training course.

Note: Condition inspectors involved in the certification process must be designated in writing by the certifying official per NAVFAC P-307, paragraph 4.2.

6 September 2018 — **Training** — *Navy Crane Center 18-T-06*

Navy Shore Weight Handling Training Brief!

Title: Building Cranes Required to be Procured by Navy Crane Center
Target Audience: Facilities Engineering Commands, Public Works Departments, User-Activities

Navy Crane Center (NCC) Instruction 11450.1B prescribes the types of cranes that require acquisition by NCC. Occasionally, contracting agencies or user-activities are not aware of these requirements and include such cranes in construction contracts or procure the cranes independently and omit essential NCC design requirements, which can lead to additional costs and delays to bring the cranes into compliance.



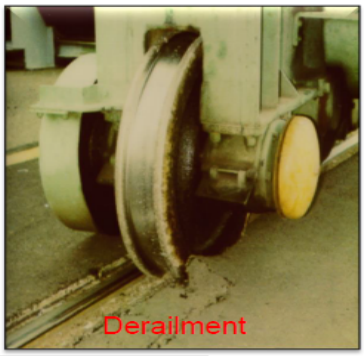
- NCC acquisition is required for all overhead traveling cranes, gantry cranes, wall cranes, jib cranes, davits, pillar cranes, monorails, and hoists with rated capacities of 20,000 pounds and greater.
- NCC acquisition is also required for these types of cranes with rated capacities less than 20,000 pounds intended for use in the following applications:
  - Ordnance handling
  - Molten metal handling
  - Special purpose service (SPS) per NAVSEA 0989-030-7000
  - Hazardous area applications per the National Electrical Code
  - Precision handling requiring complex or synchronized lifting
- Waivers may be granted when it can be shown that it is more advantageous to include the crane in a construction contract or be locally procured. Specific requirements for waivers are noted in NAVCRANECENINST 11450.1B.
- NCC is available to procure small general purpose cranes upon request.

NCC involvement early in the planning process is essential to ensure the crane properly interfaces with the building, is properly budgeted, specified, reviewed for design compliance, meets contract quality requirements, and fully meets the end user's mission. As soon as a crane is identified (or even suspected) in a planned procurement, contact NCC's Project Management Division at 757-967-3810 or NFSH_NCC_Project_Management@navy.mil.

20 September 2018 **Training** *Navy Crane Center 18-T-07*

Navy Shore Weight Handling Safety Brief!

Title: Chocks/Wedges in Crane Travel Path
Target Audience: Weight Handling Program Personnel

There have been over 15 accidents and near misses reported involving cranes that have traveled too close to, into, onto, or over chocks and wedges (wooden and metal). These events occurred during all phases of work, including the repositioning/stowage of cranes, during operator daily checks, and during production and maintenance evolutions.

- **These events can quickly escalate from a near miss to derailment.**
- TO AVOID INJURY, DAMAGE OR DERAILMENT, USE ORM BY:
  - ✓Accounting for all chocks/wedges, both ON AND from IN FRONT OF the wheels and confirming they are properly stowed/moved.
  - ✓Performing a THOROUGH SECOND CHECK just prior to movement.
  - ✓Being mindful of your surroundings and staying vigilant.
  - ✓Maintaining situational awareness and not becoming distracted.
- OTHER HELPFUL ACTIONS COULD INCLUDE:
  - Improve visibility of chocks (e.g., bright paint/tape, attach a flag or pull rope).
  - Add specific checks to the ODCL, pre-travel communication process, and to procedures for returning a crane to operation after maintenance.
  - Some activities have also added chock "holders" onto their crane structures, providing a visible indicator to personnel (i.e., check that all holders contain a chock) as a second check.

2 August 2018 **SAFETY** *Navy Crane Center 18-S-06*

DID YOU KNOW?
3D PRINTING

Many of us are familiar with the term "3D printing" but more and more this technology is being evaluated for use in weight handling equipment. There are a number of methods and material types used in 3D printing which are being evaluated in the Navy weight handling community. This technology can be used for rapid prototyping to develop original designs or even fabricate end products for use in the field.

Rapid prototyping is a generic term used to describe quick fabrication of three-dimensional (3D) parts from computer aided designs. Rapid prototyping is an excellent design tool as it has the ability to not only speed up the design process, but also helps to create a more refined end product. It allows a designer to quickly and inexpensively create a prototype of the product for fit and function testing. Once flaws are identified, the designer can make the appropriate modifications to the computer model and print another test piece. Rapid prototyping is generally done through additive manufacturing, which is commonly known as 3D printing.

3D printers create a real world three-dimensional object from a three-dimensional computer based digital model, typically by laying plastic on top of plastic. An inaccurate but simplistic example would be a traditional inkjet printer that prints the same square multiple times, layer on top of layer, until a cube exists that can be held.

Fused Deposition Modeling (FDM) is what one generally pictures when discussing 3D printing. This type of printer feeds a spool of filament into a printer nozzle which heats and lays molten plastic onto a build plate. The printer moves the nozzle along specified x- and y-coordinates, laying down molten material in the desired pattern. Once a layer is complete, the build plate lowers a small distance so that the next layer can be printed on top of the previous layer. This process continues until a three-dimensional object is complete. FDM printers are the most commonly available and least expensive 3D printer, which is why there are a variety of "desktop" FDM printers for in-home use.

There is an assortment of 3D printing technologies available to the public, most of which print with plastic. A few methods do exist for printing with metal, but those technologies are more involved and require additional equipment to produce viable products (e.g. bottled argon gas for the build chamber and an oven for post-print heat treatment). Metal 3D printing is not as wide spread or refined as printing with plastics.

3D printing was created in 1986, but did not enter mainstream vernacular until the mid-2000s. Since then, 3D printing has experienced extreme growth in technological advancement and implementation, especially through the development of in-home desktop printers. Even though there has been a lot of progress, the technology is still in its infancy and is rapidly expanding into new markets.

There are multiple Navy Lifting and Handling Departments that have recently purchased large "Production Series" FDM printers. These printers are much more versatile than their smaller desktop counterparts and can produce physically larger prints much faster, more precise, and from a wider variety of materials.

The polymers used in the large "Production Series" printers (ABS, Nylon, ULTEM, etc.) have a varying degree of tensile strength. Printing speeds and ambient air, build plate, and extruder nozzle temperatures can affect layer adhesion. User controlled settings, along with the tensile strength of the base material, will affect the overall strength of the 3D printed product. Even the orientation of the object on the build plate (e.g. top, side, 30° rotation, etc.) can drastically affect the external force necessary to cause failure. The experience of the personnel using 3D printers is critical to the overall appearance, strength, and quality of the printed part.

3D printing technology is still in relative infancy especially with respect to the Navy weight handling community. However, there are a number of activities currently researching ways to use this technology on weight handling equipment. Any activities planning to utilize 3D printing technologies should carefully evaluate and vet the item's use. Destructive tests may be necessary to prove that the selected base material and print conditions are suitable to produce a strong and capable end product.

A few examples of items 3D printed by Navy Lifting and Handling Departments are: a secondary upper limit weight, auxiliary hook block spacers, A/C thermostat cover, go/no-go gauge, and a variety of training or visual aids such as a BSDS brake actuator assembly and a scaled down electric motor housing. Navy Crane Center is available to discuss this technology and any specific applications an activity may have for use on Navy cranes.

WEIGHT HANDLING PROGRAM SAFETY VIDEOS

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.

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.