



NAVY CRANE CENTER

FISCAL YEAR 2014

ANNUAL REPORT

Enable the Warfighter
Act Judiciously
Maintain Readiness

NAVY CRANE CENTER

**PEOPLE HELPING PEOPLE PUT SHIPS TO SEA
THROUGH WEIGHT HANDLING SAFETY**



**SUPPORTING FLEET READINESS
WITH A STRONG SENSE OF URGENCY**

This Navy Crane Center fiscal year 2014 annual report is approved for distribution.

Handwritten signature of Timothy D. Blanton in blue ink.

Timothy D. Blanton
Director, Navy Crane Center

EXECUTIVE SUMMARY

This Annual Report highlights the many contributions of the Navy Crane Center in Fiscal Year 2014 (FY14) and reports on the progress toward achieving a safe and reliable weight handling program that is essential to Fleet Readiness. This report provides information on our organization, mission, operations oversight, acquisition, engineering technical support, and information technology.

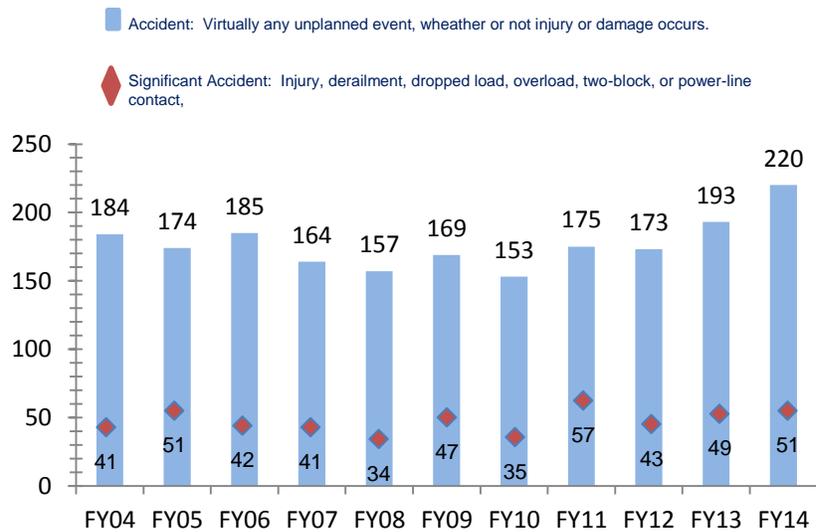
Navy shore activities had another very safe year in FY14. With over two million crane lifts and millions of rigging operations made at more than 400 Navy shore activities, detachments, and shore-based operating units, only three Navy crane accidents reached the reporting threshold of OPNAV Instruction 5102.1.

With our “wide aperture” definition for crane and rigging accidents, i.e., virtually any unplanned

event regardless of degree of injury or whether damage occurred, our philosophy of reporting, analyzing, and learning from the small events has proven effective in keeping the number of truly serious accidents at a very low level. We are now realizing incremental progress in raising the sensitivity on the part of activity personnel to report very minor accidents (no damage), near misses, and other unplanned events. Although this has resulted in an increase in reported accidents, the ratio of significant accidents to total crane and rigging accidents has been declining since FY11. Activities continued to respond well to the challenge of reporting near miss events during FY14 by exceeding the near miss report submissions of FY13 by 20 percent (and FY14’s total was four times as many as those reported in FY11). This data indicates a maturing Navy weight handling program community. This healthy strategy will significantly and continuously improve the safety of Navy shore weight handling operations over the long term.

Despite the outstanding record of avoiding serious accidents, there were still 51 crane accidents and 21 rigging accidents that involved injuries, dropped loads, two blockings, derailments, or overloads. Accidents classified as such typically have a higher probability of a more severe outcome. Identifying unsafe acts before they lead to accidents is a significant challenge in the weight handling community. More and more activities have established oversight (surveillance) programs to find, document, and learn from such acts. The Navy Crane Center continued to make this a major focus of our evaluations of weight handling programs and provided activities with numerous examples of lapses, shortcuts, and unsafe acts during reviews of shop, waterfront, and

SHORE ACTIVITY CRANE ACCIDENT TREND



in-hull operations. As the Navy shore activities' oversight programs mature, we should see continued declining accident severity trends in the future.

We continued to issue Weight Handling Safety Briefs to quickly promulgate current negative or dangerous trends in weight handling equipment and operations. These briefs are intended to quickly notify and enlighten the men and women in production shops and at the waterfront who conduct millions of lifts annually at Navy activities.

Activity compliance with NAVFAC P-307 requirements continued at a very high level. In FY14, only one activity's weight handling program was adjudged as unsatisfactory. This is a positive indicator of the importance of well-maintained, safe equipment operated in a safe manner. The Navy Crane Center continued to provide technical assistance, training, and additional monitoring to those activities that experienced challenges meeting NAVFAC P-307 requirements due to such factors as the loss of key personnel, new missions, and increased operations tempo.

Navy shore activities maintained the high standard of equipment condition established in previous years. This metric is a key indicator of equipment readiness at Navy shore activities to meet Fleet weight handling requirements. Crane mechanics, inspectors, and load test directors have continuously improved their proficiency over the years.

Our Acquisition Department continued to make significant contributions assisting Navy shore activities to meet mission requirements and maintain Fleet Readiness through acquisition and reconstitution of weight handling equipment. In FY14 we awarded orders for delivery of 28 new or overhauled cranes and accepted 13 cranes. We provided consultation and technical assistance on 52 cranes not procured by us, including specification development, cost estimating, quality assurance, and life-cycle support. In addition, we provided technical and procurement services to the Army for container cranes at military ocean terminals in Sunny Point and Concord.

Our In-Service Engineering Division provided reach-back crane and rigging engineering expertise to activities in need of immediate assistance, including accident recovery on a portal crane, controls troubleshooting for a floating crane, and rigging engineering for a new shipboard weapon system.

Training is a major contributing factor to the improvements being achieved by the Navy shore activities. In FY14, approximately 7,700 Navy Crane Center online training course completions (by more than 6,000 personnel) were recorded. We used our Weight Handling Training Briefs (WHTB) to provide immediate fundamental training on timely subjects, including a special series of WHTBs addressing the weight handling safety triangle, the surveillance program, and the Human Factors Analysis and Classification System.

A safe and effective weight handling program is essential to Fleet Readiness. The Navy Crane Center provides effective criteria management, oversight for compliance to maintain readiness, training support, assistance in weight handling program management, engineering, inspection, safety analysis and reporting, and acquisition of new and reconstituted equipment to assist Navy shore activities in support of the Navy's increasing mission challenges.

NAVY CRANE CENTER

MISSION

We lead the Navy's shore activity weight handling program by establishing policy and providing engineering, acquisition, technical support, training, and oversight for compliance to maintain readiness.

VISION

We are the organization of choice for weight handling program solutions. We are leaders who offer and deliver timely and effective weight handling program solutions.

FUNDAMENTAL OPERATING PRINCIPLE

Our Navy Crane Center Team will NEVER compromise safety and quality as we work to meet schedules with a strong sense of urgency in support of Fleet Readiness.

Our Actions are guided by the Navy's core values of HONOR, COURAGE, and COMMITMENT.

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NAVY CRANE CENTER

Our headquarters is located in Portsmouth, VA at the Norfolk Naval Shipyard. Our field offices are located in Portsmouth, NH, Pearl Harbor, HI, Puget Sound, Bremerton, WA, Keyport, WA, San Diego, CA, Newport News, VA, and Groton, CT.

PEOPLE

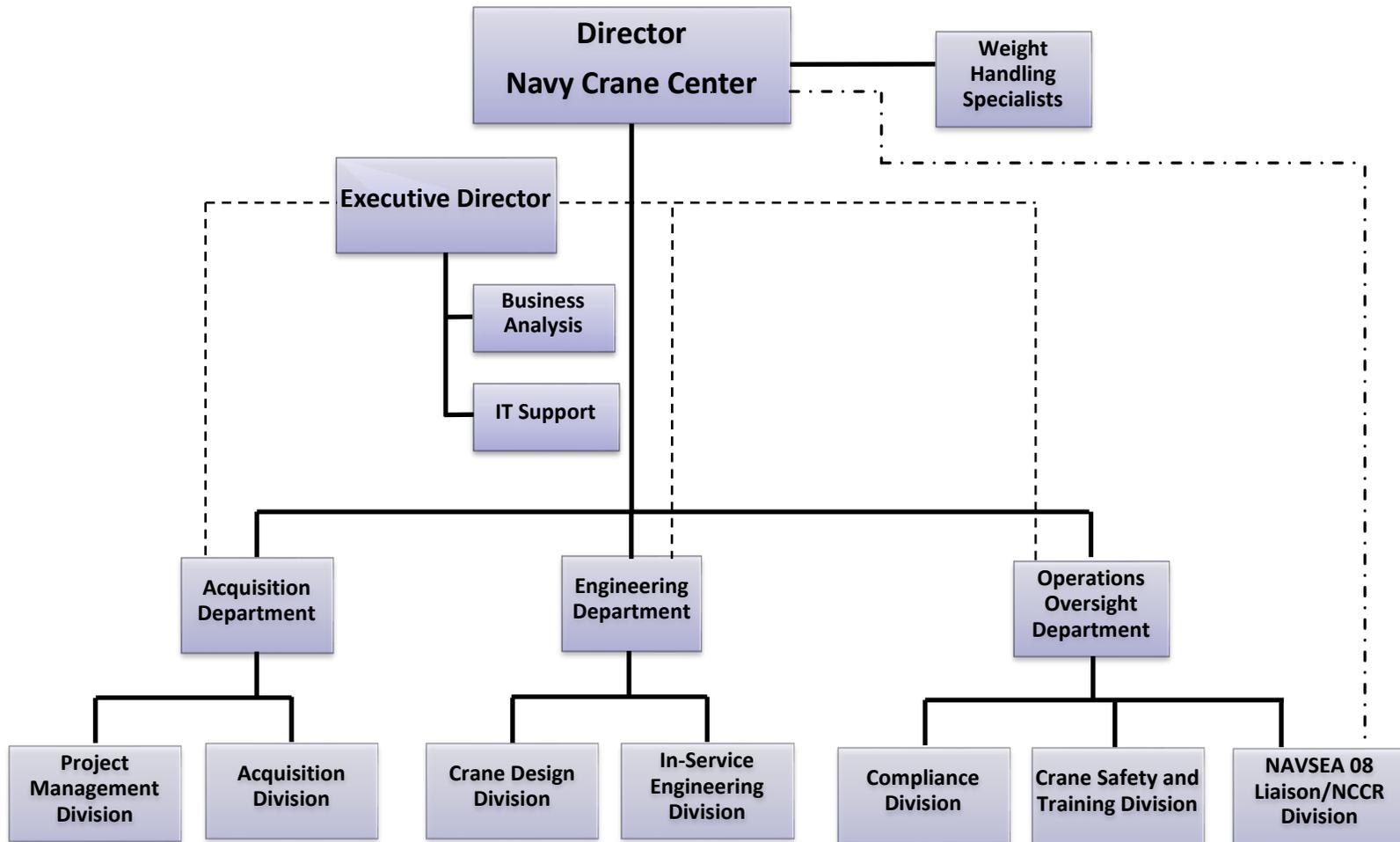
We are engineers, project managers, contract specialists, equipment specialists, training specialists, safety specialists, information technology specialists, and support professionals dedicated to the success of our supported commands and Navy shore activities that provide a vast array of safe and reliable weight handling services to our fighting forces. Corporately, we have centuries of experience in engineering, acquisition, and life-cycle management of weight handling equipment. Our staff includes registered professional engineers, engineers and other professionals with advanced degrees, DAWIA-certified professionals, members of the Acquisition Corps, graduates of executive and leadership programs, and personnel with hands-on practical experience in the installation, operation, maintenance, inspection, and testing of all types of weight handling equipment.

MISSION

In September 1997, the Secretary of the Navy signed SECNAVINST 11260.2, *Navy Weight Handling Program for Shore Activities*. This established the Navy Crane Center as a NAVFAC Echelon 3 Command and the cognizant command responsible for standardizing and improving weight handling programs at Navy shore activities worldwide. As stated in the SECNAVINST, "*Safe and reliable weight handling is critical to the operation of the Navy. Each day, the Navy applies its extensive inventory of weight handling equipment to lift ordnance, naval nuclear propulsion plant components and equipment, new and spent nuclear fuels, electronic equipment, hot metals, components of ships and submarines, supplies, construction materials, and hazardous material items needed to support the Navy's worldwide commitments. Safe conduct of these operations is key to precluding damage to equipment or personnel injury.*"

Per SECNAVINST 11260.2, our Director reports directly to the Commander, NAVFAC, and has direct access to the Chief of Naval Operations and the Assistant Secretary of the Navy (Energy, Installations & Environment) on matters involving the safe and reliable operation of Navy shore-based weight handling equipment. This instruction assigns the Navy Crane Center responsibility for the Navy's shore activity weight handling program, which includes acquiring large and specialized cranes for Navy shore activities, performing compliance audits of all Navy shore activities, providing in-service engineering and accident analysis, and enhancing personnel qualifications through comprehensive training programs.

Navy Crane Center Organization



- - - - - Represents Administrative

- NAVSEA Liaison reports directly to the Director for Nuclear related issues

NAVY CRANE CENTER OFFICES



OPERATIONS OVERSIGHT

The engineers, equipment specialists, safety specialists, trainers, and support personnel who comprise our Operations Oversight Department continued to make direct and significant contributions to Fleet Readiness in FY14 through technical support, program oversight, accident prevention initiatives, training, and thorough compliance and program management reviews.

The quality of Navy shore activity weight handling management, as reflected in our evaluation program, again remained high in FY14. One key metric is the percent of activities that are in basic compliance with NAVFAC P-307 requirements. In FY14, only one program was considered unsatisfactory. However, some activity programs had declined from their previous evaluation. Where the decline was significant, the activity was given a summary rating of marginally satisfactory. In FY14, 14 programs were rated as marginally satisfactory. Another metric is satisfactory inspection sample cranes. Shore activities have continuously improved the quality and reliability of their cranes. In FY14, the satisfactory rate increased to 84 percent, up from 83 percent in FY13. The rate of satisfactory inspection sample cranes was 53 percent when the evaluation program began in 2001.

Between 2007 and 2009, we expanded the focus of our evaluation, while still maintaining oversight of compliance to requirements. The enhanced evaluation process includes in-depth reviews of program management issues, such as staffing and succession planning, resource management, and strategic planning, in addition to an expanded focus on equipment by also reviewing in-process maintenance, troubleshooting, and equipment reliability. By increasing our focus on program management issues, Navy shore activity lifting and handling programs are strengthened for the long term. As a result of this process, we have had fewer weight handling programs evaluated as less than satisfactory in successive years. In FY14, as part of this ongoing initiative, we modified our terminology to “evaluation” vice “audit” to clarify and mature the program. Although the evaluation process is not changing, the word “evaluation” provides a better description of the overall review process, as we not only verify compliance with requirements but we also review overall management of the weight handling program to identify potential weaknesses and vulnerabilities in the program, both currently, and for the long term based on the activity’s mission. Similarly, within the next two years, a significant revision to NAVFAC P-307 will add a program management section to this functional document.

Support to the Naval Nuclear Propulsion Program (NNPP) continued to expand in FY14. The Navy Crane Center is now conducting evaluations at the three Department of Energy (DOE) laboratories that conduct NNPP work and has assigned a Navy Crane Center Representative to liaison with these laboratories. We continued to assist Naval Reactors in their initiative to improve their weight handling programs by evaluating for compliance to the recently implemented NAVFAC P-307 requirements. Navy Crane Center also initiated assist visits at NNPP DOE sites to continue improvement with a cost-effective crane maintenance program. Additionally, we assisted Naval Reactors

with special purpose service weight handling reviews in preparation for NNPP key events at Newport News Shipbuilding and Electric Boat Corporation. We continued to provide "next day" service for third-party certification of cranes required for provisioning ships on short notice.

Finally, we continued to provide multi-faceted support to the Naval Construction Force, including participation on steering groups, hands-on training, engineering, and technical support for their many and varied missions worldwide.

NAVY SHORE ACTIVITY WORLDWIDE CRANE INVENTORY

CRANE TYPES	NUMBER OF CRANES
Category 1 Cranes	396
Category 2 Cranes	388
Category 3 Cranes	6,432
Category 4 Cranes	94
*TOTAL	7,310

*Includes Active and Inactive Cranes

TYPES OF CRANES

Category 1 Cranes

Portal cranes	Hammerhead cranes
Locomotive cranes	Derricks
Floating cranes (YD)	Tower cranes
Container cranes	
Aircraft crash cranes	
Mobile boat hoists including self-propelled and towed types	
Rubber tire gantry cranes	
Mobile cranes (except those indicated as category 4) including truck, cruiser, crawler, warehouse/industrial cranes, and cranes used for dragline, pile driving, clamshell, magnet, and bucket work.	

Category 2 and 3 Cranes (Cranes with certified capacities of 20,000 pounds or greater are category 2. Cranes with certified capacities less than 20,000 pounds are category 3.)

Gantry cranes (rail mounted)	Wall cranes
Jib cranes	Pillar cranes
Pillar jib cranes	Boat davits

Overhead traveling cranes (including runway track and hanger supports for underhung cranes).

Monorails and associated hoists (including track, switches, and hanger supports).

Fixed overhead hoists, including fixed manual and powered hoists.

Pedestal mounted commercial boom assemblies (fixed length and telescoping types) attached to stake trucks, trailers, flatbeds, or railcars, or stationary mounted to piers, etc., with certified capacities less than 2,000 pounds.

Category 4 Cranes

Commercial truck mounted cranes.

Articulating boom cranes, including ammunition handling truck/cranes with equipment category code 0704.

Pedestal mounted commercial boom assemblies (fixed length and telescoping types) attached to stake trucks, trailers, flatbeds, or railcars, or stationary mounted to piers, etc., with certified capacities of 2,000 pounds and greater.

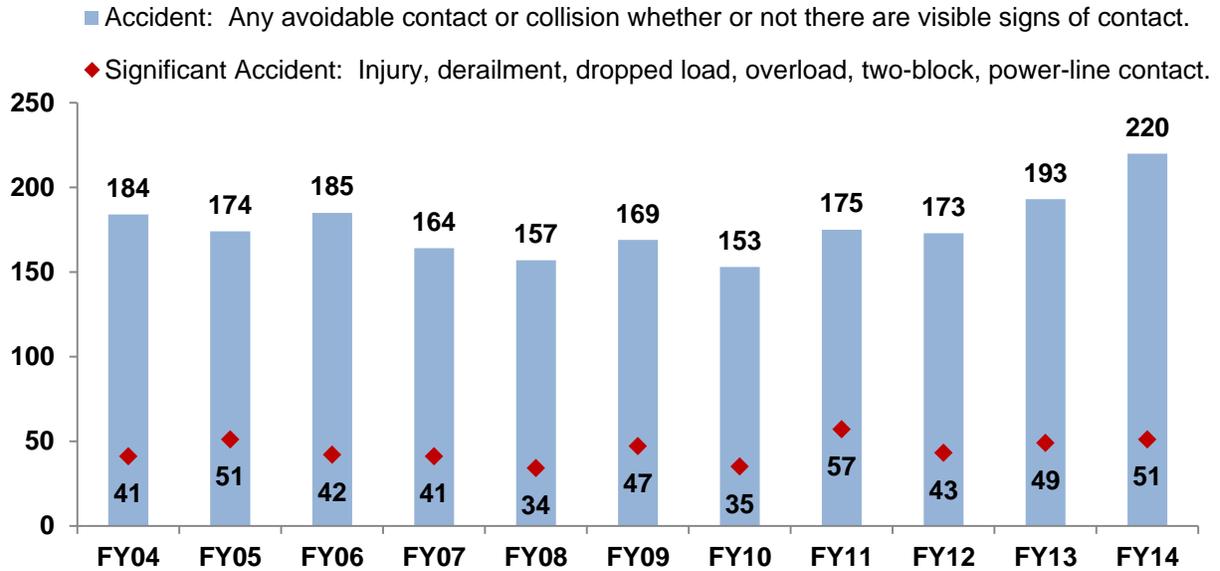
WEIGHT HANDLING EQUIPMENT ACCIDENTS

To maintain our intense focus on SAFETY, we have very rigorous crane and rigging gear accident definitions that include essentially any unplanned event in a weight handling evolution, whether or not injury or damage occurs. The basic strategy is that ALL accidents (regardless of severity) must be reported to ensure we benefit from the lessons learned to prevent more serious accidents from occurring. We have encouraged all Navy shore activities to make the principles of OPNAVINST 3500.39C, Operational Risk Management (ORM), standard practice for every weight handling operation. This includes operating a crane without a load. In FY14, 43 percent of all crane accidents occurred with no load on the hook. Consistent application of ORM principles during every crane operation will significantly reduce accident severity. Human error continues to be the primary cause of most accidents. We continue to encourage Navy shore activities to drive toward our goal of continuous improvement of safety in weight handling equipment. We also strongly encourage activities to investigate and report near misses and other unplanned events that do not fall under our accident definition. Learning from such events can prevent accidents from occurring and significantly improve operational efficiency. The submission of Navy weight handling near miss reports increased 20 percent (226 vs 188) over FY13. As recently as FY10, the number of near misses reported was 29. This illustrates how activities are embracing the concept of identifying, correcting, documenting, and sharing lessons learned from tangible anomalies that have the potential to lead to an accident. Activity deck plate operations oversight has contributed to this very positive trend.

CRANE ACCIDENTS

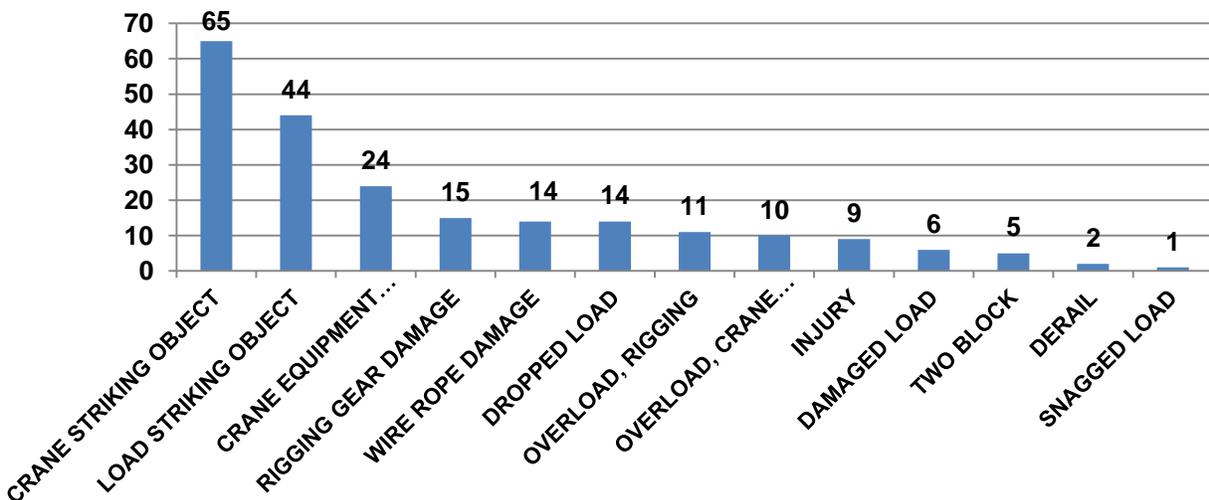
The FY14 crane accident total was 220 (51 significant) as of the date of this publication compared to 193 and 49, respectively, for FY13.

SHORE ACTIVITY CRANE ACCIDENT TREND

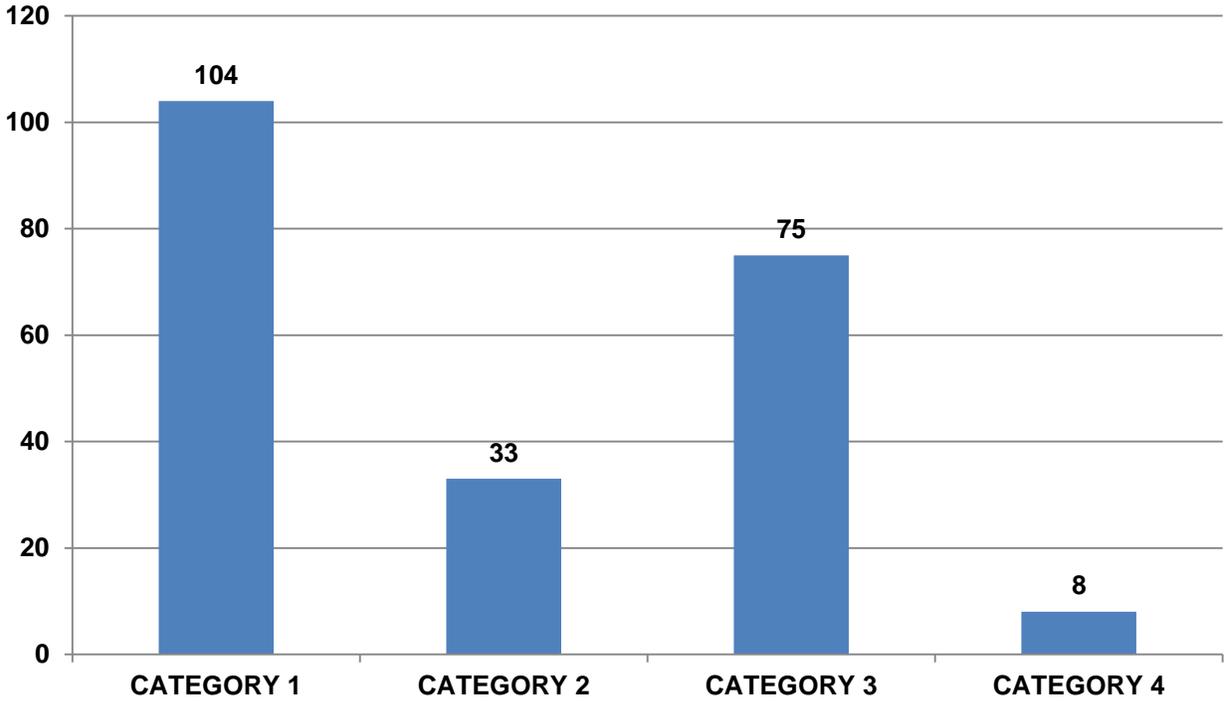


Accidents considered significant (dropped loads, two-block, overloads, derailments, and accidents involving injuries), i.e., those accidents that have the potential to be more serious, increased slightly over the FY13 total, primarily due to an increase in dropped loads and injury related events. Three Navy crane accidents met the OPNAV accident classification reporting threshold; two Class C events and one Class B event. Accidents involving crane collisions represented 50 percent of all crane accidents. FY14 saw a 38 percent increase in crane collisions and load collisions as compared to FY13. On a positive note, the majority of the collision related events resulted in little to no damage.

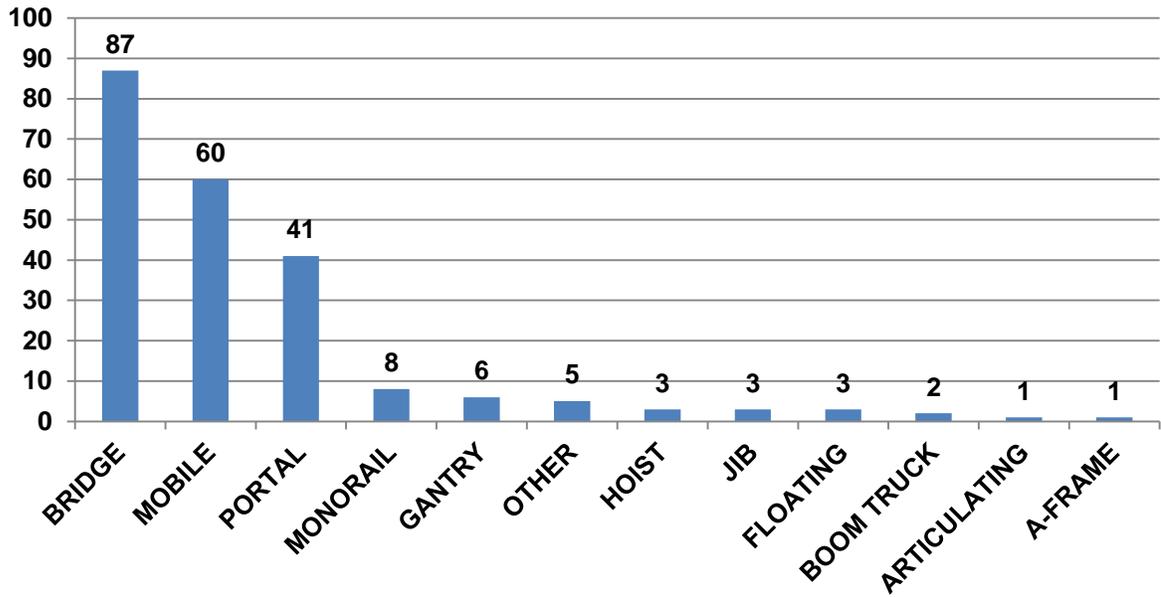
CRANE ACCIDENT TYPE



ACCIDENTS BY CRANE CATEGORY



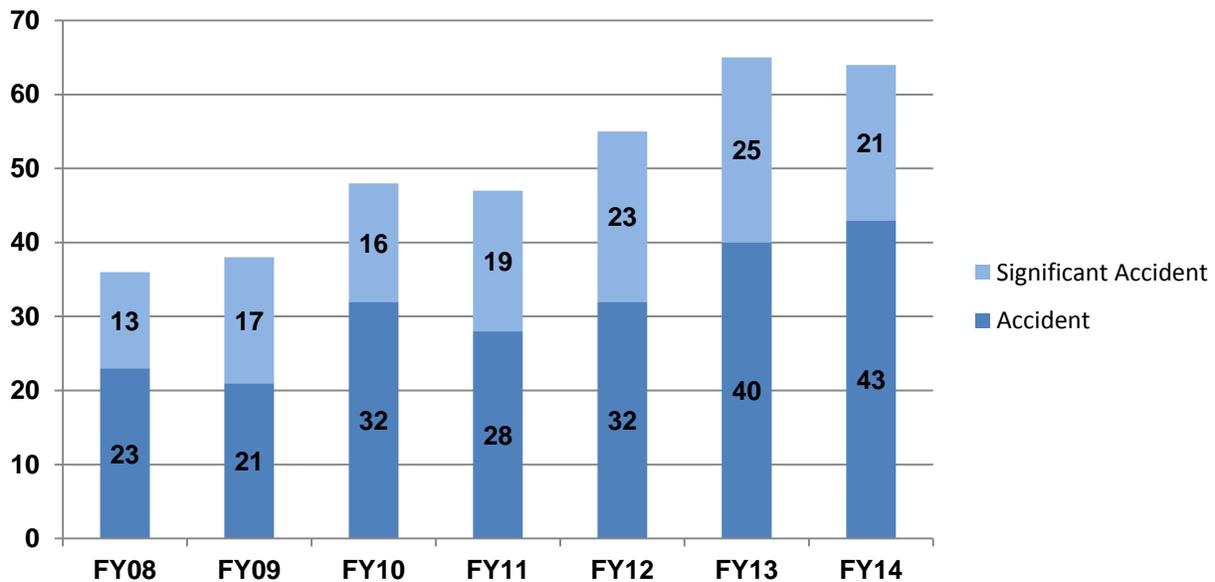
ACCIDENTS BY CRANE TYPE



RIGGING GEAR ACCIDENTS

Rigging gear accidents are those that occur when gear covered by NAVFAC P-307, Section 14, is used by itself in weight handling operations; i.e., without Category 1 through 4 cranes. In FY14, 64 rigging gear accidents were reported as compared to 65 in FY13. The combined significant accident categories of personal injuries, dropped loads, overloads, and two-blocking accidents accounted for 21 of the 64 accidents (33 percent vs 37 percent in FY13). Three accidents reached the reporting threshold of OPNAV Instruction 5102.1. Five of the significant rigging gear accidents resulted in injury to a person within the weight handling envelope, two of which resulted in lost workdays. The number of load collisions in FY14 almost doubled the number that occurred in FY13. Considering that most of the load collisions resulted in little to no damage, it is believed that the increase in these reportable events is directly related to an increase in sensitivity for investigating and reporting minor events.

RIGGING GEAR ACCIDENTS



EVALUATIONS

The evaluation component of our mission continued to reinforce the requirements of NAVFAC P-307 and drive improvements in the overall quality and safety of weight handling programs at Navy shore activities and operating units. Our evaluation teams provide a rigorous compliance and program review that is focused on identifying process problems to better enable the activity to perform thorough self-assessments and to determine effective long-term corrective actions. The evaluation process (along with the integral coaching assistance that occurs during an evaluation) has continued to

improve weight handling programs and maintain the reliability of equipment in the Navy shore establishment.

The quality of weight handling programs at Naval shore activities remains high. One key metric used is the percent of activity programs that are satisfactory and in basic compliance with NAVFAC P-307 requirements. In FY14, there was only one activity whose weight handling program was evaluated as unsatisfactory. However, some activity programs had declined from their previous evaluation. Where the decline was significant, the activity was given a summary rating of marginally satisfactory. In FY14, 14 programs were rated as marginally satisfactory.

The condition of inspected cranes is another metric for evaluating the quality of weight handling programs. Shore activities have demonstrated continued excellent performance with 84 percent of the sampled cranes being satisfactory, up from 83 percent in FY13. In addition, we continued to strongly encourage Navy shore activities to review their crane utilization and remove unneeded cranes from service wherever possible and develop a crane replacement and modernization plan to ensure future weight handling requirements are addressed. Some activities with small inventories of little-used cranes were able to deactivate their inventories and thus avoid the cost of maintaining a weight handling program.

The three most common categories of evaluation findings in FY14 were all interrelated: the lack of reported lower-level accidents and near-misses (including unsafe acts) by most activities; the lack of a monitor (surveillance) program or an established program that fails to find tangible deficiencies (those unsafe acts and omissions that could lead to accidents); and the significant numbers of unsafe acts found by the evaluation teams during waterfront and shop surveillances. The evaluators' ability to readily detect these tangible deficiencies in the short time of the evaluation highlights the need for activities to become more proficient at finding and preventing them. The evaluation teams stressed the importance, and the benefits, of a locally-developed documented monitor program to improve operational safety. Another weakness at many activities, which directly relates to the above-noted items, is a poor, or sometimes non-existent, self-assessment. Many activities still lack the ability to develop effective self-assessments. An effective monitor program that identifies and documents unsafe acts and omissions (which are readily found by evaluation teams) will provide a strong basis for an effective, self-critical self-assessment.

The Navy Crane Center continued to perform weight handling program evaluations at three non-Navy organizations which support the Naval Nuclear Propulsion Program (NNPP): Newport News Shipbuilding, Electric Boat Corporation, and the Naval Reactors Facility, Idaho. These evaluations ensure that Navy weight handling standards are maintained at all activities that conduct NNPP work. Reduction in weight handling equipment accidents, standardization with naval shipyards, and sharing of best practices were major areas of focus at each organization. In FY11, Naval Reactors mandated that DOE laboratories that perform NNPP work utilize NAVFAC P-307 as the standard for management of their weight handling programs. In FY13, we conducted

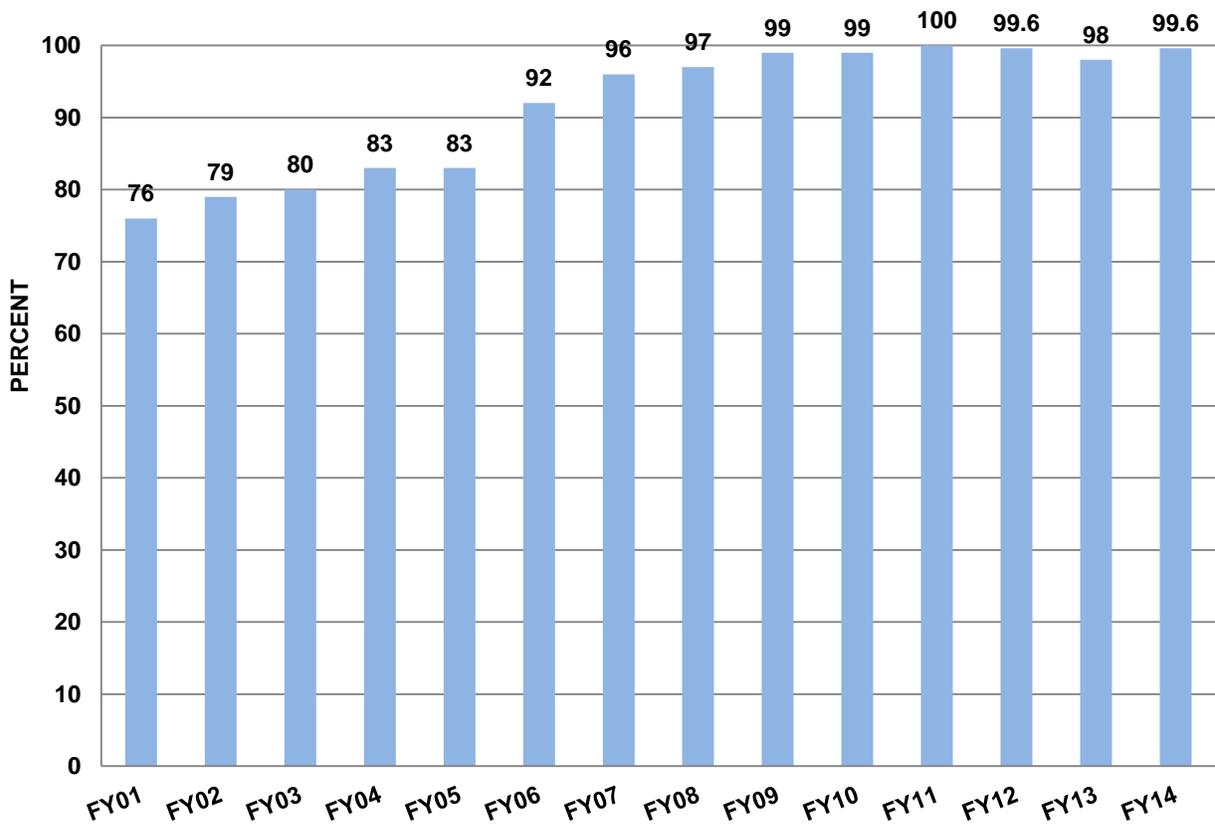
our first weight handling program evaluations at the three DOE laboratories that now fall under NAVFAC P-307 - Bettis Laboratory, Knolls Atomic Power Laboratory, and Kesselring Site. These evaluations continued in FY14.

With the success of our expanded program evaluations at shipyards, NAVSEA 08 is no longer reviewing lifting and handling during their biennial reviews. Instead, a NAVSEA 08 representative has been attending Navy Crane Center evaluations on a biennial basis since the beginning of 2009. This initiative has resulted in cost avoidance for NAVSEA 08 and the shipyards.

Activity Program Compliance Progress

Of the 245 Naval activities evaluated in FY14, 94 percent were fully satisfactory (fundamentally sound), 6 percent were marginally satisfactory, and only one activity was adjudged unsatisfactory. The overall positive performance in activity compliance with NAVFAC P-307 requirements continues a positive trend of activity compliance and is a major improvement from the initiation of the evaluation program in FY98, when only 19 percent of activities evaluated were fundamentally sound.

ACTIVITIES IN COMPLIANCE



Equipment Condition-Cranes

In FY14, the evaluation teams inspected 239 cranes. The satisfactory rate was 84 percent, reflecting continuing improvement equipment inspection and maintenance.

Unsatisfactory Cranes

Reasons for unsatisfactory cranes included the following:

- Seven cranes were not tested properly.
- Six cranes would not operate properly.
- Three cranes had brake air gaps/torque springs out of specification.
- Three cranes had other brake deficiencies.
- Three cranes had wire rope deficiencies.
- Two cranes were not load tested after work on load bearing parts.

Program Management Issues

Although the majority of weight handling programs are well managed, some activities still have challenges. At activities that are operated by base operating service (BOS) contractors, a common thread for good programs was a strong government oversight program of contractor performance. However, in a few instances our evaluation teams identified activities where the proper level of government oversight was lacking, resulting in weak overall program performance. Similarly, these activities have also had difficulty in properly overseeing non-BOS contractor crane operations on their sites. Navy Crane Center evaluators focused heavily on both of these related issues. During FY14, our evaluation teams continued their focus on the utilization of self-critical assessment and internal surveillance programs, which have proven effective at many activities in reducing crane accidents. At activities where operations and services were performed in-house, the better activities have developed a strong monitor program and are internally self-critical in all areas of their weight handling programs.

In FY13 and into FY14, government sequestration and the overall budget constraints also presented some unique challenges to our evaluation teams. We directed the evaluation teams to intensify their reviews of program management issues, with particular focus being placed on key vacancies and gapped positions due to the hiring freeze, as well as increased workload due to overall manning decreases, furloughs, and overtime restrictions. At some activities, the negative effects of these policies were evident and these issues and concerns were emphasized in our evaluation reports. Additionally, in some cases where the significance warranted, Navy Crane Center management separately contacted the affected activity's immediate superior in

command to further elevate the issues. In FY14, as these restrictions were lifted, our focus shifted to the training and mentoring of new employees at the activities, in addition to continued focus on manning shortages and gapped positions until these vulnerabilities are fully mitigated.

Over the past few years, and continuing in FY14, our evaluation teams increased their focus on the oversight of contractor cranes due to an increase in accidents associated with contractor cranes. We saw a reduction in contractor crane accidents in FY14 compared to FY13, and a 32 percent overall reduction from FY10 contractor crane accidents.

Accidents involving the use of multi-purpose machines, forklifts, and construction equipment to lift suspended loads continued to be a concern. Due to an increase in the use of these machines as substitutes for cranes to lift suspended loads and the problems associated with these operations, the December 2009 revision to NAVFAC P-307 included those machines in our program when the machines are used to lift suspended loads. Additionally, rigging gear used with these machines is now required to be NAVFAC P-307 compliant and personnel performing the rigging must be trained. This area was a focal point of our evaluations during the past year as significant problems continue to be identified. As stated above, a strong government oversight program is critical to mitigate risk and to minimize hazards to Navy property and personnel.

Lastly, a few activities were identified with inadequate Category 3 crane operations programs. Common problems seen at these activities included improperly performed crane pre-use checks, the lack of hands-on training following formal training, and operations weakness due to a lack of proficiency (often as a result of too many operators with too few opportunities to develop proficiency). The December 2009 revision to NAVFAC P-307 requires Category 3 crane operators to retake the Category 3 crane safety course every three years. This requirement is helping to address this weak area for the long term; however, our evaluation teams still identified activities that were not aware of the requirement. In FY14, to further address this area of performance, our evaluation teams conducted knowledge checks of qualified personnel to assist activities in taking the appropriate corrective actions in their training and oversight programs.

Equipment Issues and Deficiencies

In general, maintenance, inspection, testing, engineering, and certification of cranes were satisfactorily conducted in FY14. Common engineering issues included Navy Crane Center comments to crane alteration request (CARs) not acknowledged and incorporated, and conditionally approved CARs not resubmitted. Common maintenance and inspection issues included inconsistencies in the performance and documentation of maintenance and inspections, poor or no documentation of specific work performed, and past (undocumented) crane alterations not recognized by inspection personnel. Common test deficiencies included knowledge deficiencies in specific brake testing and

errors in brake specification tolerance ranges. Common certification issues include weak reviews by certifying officials and inattention to detail in the certification documentation.

Inspection deficiencies included the inspector removing load bearing fasteners (which voided the certification), inspections not performed, work documents not available for in-process inspections, and wire rope not inspected completely.

Maintenance issues included significant corrosion, parts not tagged and bagged, hazardous materials not properly stored, and work documents not available.

Operations and Rigging Gear Deficiencies

Continued emphasis in safe rigging and crane operations is important to safe weight handling operations. The number of rigging gear deficiencies noted during the evaluations continued to be small compared to the total inventory of rigging gear in the NAVFAC P-307 program. The preponderance of rigging gear deficiencies were the first two items noted below. All damaged rigging gear met the rejection criteria of NAVFAC P-307, the original equipment manufacturer (OEM), or ASME B30 and were no longer safe for use. Most of the noted deficiencies should have been detected by a proper pre-use inspection of the gear. A concerted effort is required to continue rigging and operations improvements by maintaining a strong command focus on this critical weight handling area.

In FY14, our evaluation teams increased the focus on activity processes and procedures used to remove defective and damaged rigging gear from service. In many instances, our evaluation teams identified that although damaged rigging gear is being removed from service, activity personnel are not taking the required steps to investigate the damage for probable cause and report these events that meet the accident definition in accordance with NAVFAC P-307, Section 12 requirements.

In FY13 and continuing into FY14, many activities took positive action in recognition of conditions where overloading of the crane or rigging gear is possible due to binding conditions. This is due in part to Change 3 of NAVFAC P-307, which better aligned the complex lift requirements of NAVFAC P-307 and NAVSEA OP-5. Because of rapid improvement in load indicating device (LID) technology, some commands were not aware of or taking advantage of the new options these load indicators offer. In order to ensure wide distribution of this information, Navy Crane Center evaluators emphasized the benefits of this new technology during program evaluations and encouraged activity weight handling managers to “invest in the safety that the LID can provide.”

The most common operations deficiencies were:

Crane Team Performance Issues: In weight handling operations that involved crane teams, deficiencies were identified in crane team member coordination, track walker performance, and in the overall control of the lift by the rigger-in-charge (RIC).

Additionally, instances were identified where RICs performed work that could have been performed by other available personnel, which distracted the RICs from their primary role of overall control of the operation. In some instances supervisors were observed performing work, compromising their oversight role. This has been a primary focus area for our evaluation teams and many activities have improved performance in this area.

Control of the Crane Operating Envelope: Deficiencies consisted of items being left in the travel zone or working zone of the crane, and unauthorized personnel not being prevented from entering the crane operating envelope, resulting in the load being passed over individuals' heads.

Category 3 Crane Operations: As discussed above, significant weaknesses continue to be identified during observation of Category 3 crane operations, pre-use inspections, and simulated lifts, such as operators:

- omitting or improperly performing required pre-use checks
- checking upper limit switch operation at high speed
- traveling into crane stops at high speed
- securing the crane and leaving the hook block lowered as a potential obstruction
- stowing the hook by engaging the upper limit switch
- making lifts without knowing load weights
- leaving suspended loads unattended.

A cause of numerous crane accidents was side-loading, resulting in miss-spoiled and damaged wire rope. In FY14, the number of miss-spoiled cranes decreased slightly; however, this area is still a focal point for our evaluation teams.

Lifting Bound or Constrained Loads: Deficiencies included not using load indicating devices (LIDs) during lifts; not using appropriate stopping points to prevent overload of the crane, rigging gear, or item being lifted; and not having a finite means of hoisting, such as using a chain fall.

The most common rigging gear deficiencies were:

Improperly Marked Rigging Gear and Miscellaneous Equipment: Gear not marked in accordance with NAVFAC P-307 was the most common rigging gear finding in FY14. This included illegible markings, mismatched components, pin diameters not marked on alternate-yarn round slings, and gear not marked for special purpose service.

Damaged Rigging Gear: There was a 25 percent decrease in the instances of damaged gear found in FY14. Synthetic sling damage included embedded metal shavings, snags, cuts, abrasions, and cuts to the outer and inner covers of the synthetic round slings, exposing the inner core material. In many instances, damage was due to inadequate chafing protection and the selection of improper rigging gear for the job at hand. In some cases, the damage was due to improper storage of the slings when not in use. The evaluation teams continued to stress the importance of investigating the

circumstances that resulted in the damage and reporting any events that constituted crane or rigging accidents or near-miss events.

Rigging Gear and Miscellaneous Equipment Not in Any Program: This included gear that arrived on base without the knowledge of the weight handling managers.

Out-of-Date Rigging Gear: This included gear that was available for use beyond the marked inspection due date, no segregation of out-of-date gear, or gear not in the program.

Inadequate Use of Chafing and Cutting Protection for Slings: This is a significant problem area, resulting in numerous crane accidents, and therefore a focus area of our evaluation teams during observation of inside shop, pier-side, and in-hull rigging.

Improperly Tested Gear: This includes rigging gear tested with incorrect test loads, test loads not applied for proper length of time, missing test documentation, test pin diameter not identified, and required tests not performed.

Hoists: Failure to comply with Crane Safety Advisories relating to chain hoists and electric powered hoists.

Wire Rope Slings: This includes swaged fittings made of materials other than steel, and improperly made swage splices.

Eyebolts: This includes spacers that were not the proper diameter or were greater than one thread pitch in thickness; eyebolts that were incorrectly modified without engineering authorization; nuts that were improperly used; and lifts out of the plane of the eye or lifts at angles that exceeded OEM limitations for use.

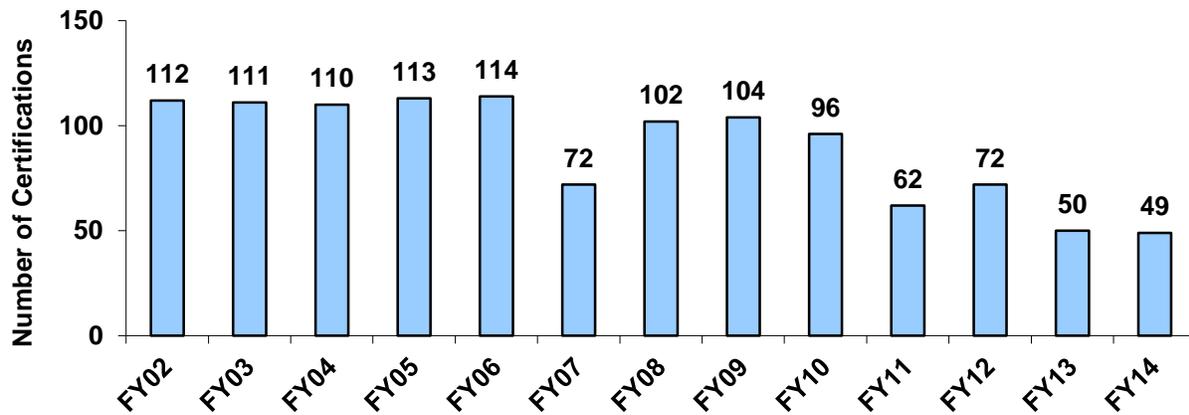
Swivel Hoist Rings: This includes swivel hoist rings not tightened to OEM torque specifications during installation, or used in configurations that exceeded OEM limitations for use.

THIRD PARTY CERTIFICATION

OSHA "maritime" standards 29 CFR 1915, (shipyard employment), 29 CFR 1917, (marine terminals), and 29 CFR 1918, (long shoring), require certification of applicable cranes by an OSHA accredited certification agency (third party certification) in accordance with the certification procedures of 29 CFR 1919 (gear certification). These regulations affect floating cranes used in shipbuilding, ship repair, and shipbreaking, and all shore-based cranes used in cargo transfer. NAVFAC P-307 is an OSHA-approved alternate standard whereby OSHA recognizes the Navy Crane Center as a third party certifier of Navy-owned cranes to the requirements of NAVFAC P-307.

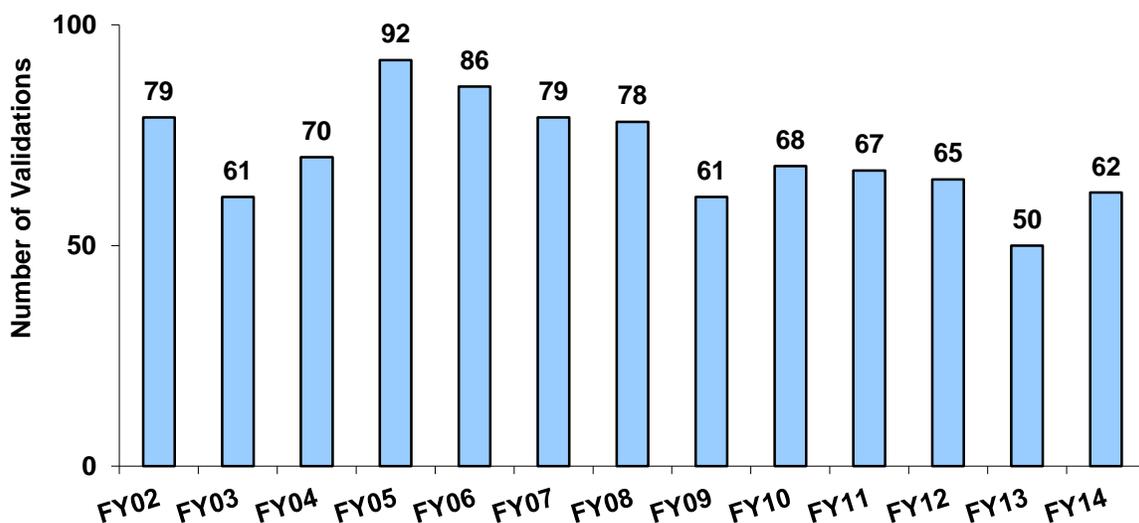
The graph below indicates the number of third party certifications performed, which includes both annual certifications and interim re-certifications. The decrease in

certifications in the last four years reflects fewer interim re-certifications as a result of improved maintenance at the activities.



VALIDATION FOR SPECIAL PURPOSE SERVICE

Validation is the second level approval (by the Navy Crane Center) of the activity certification of cranes used in special purpose service (SPS) as defined in NAVSEA 0989-030-7000. This consists of complete record review, independent condition inspection, and verification of the proper conduct of the crane condition inspection and load test performed by the activity. Navy Crane Center Instruction 11200.33 provides detailed directions of conducting a validation. The graph below indicates the number of validations performed, which includes both annual certifications and interim re-certifications. As noted above, improved maintenance by the shipyards has resulted in fewer interim re-certifications, as reflected in the graph.



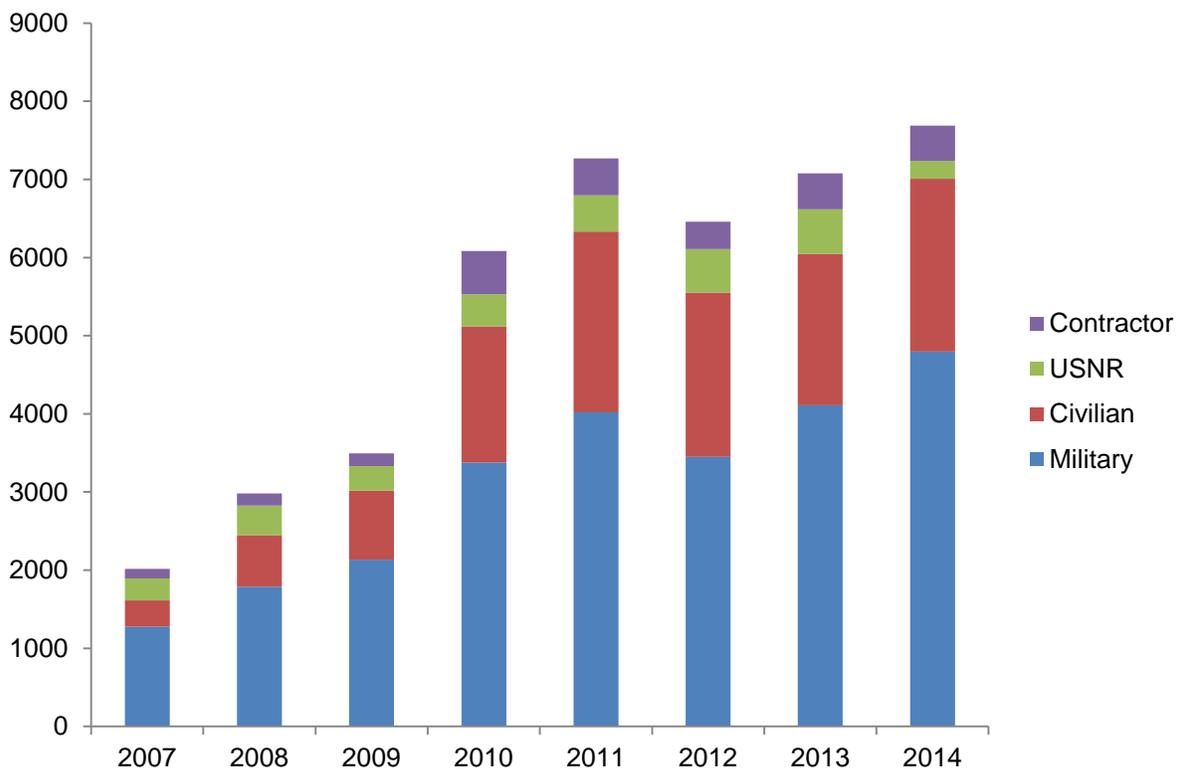
TRAINING

Personnel involved in the maintenance, alteration, repair, inspection, testing, and operation of Navy owned WHE shall be trained and qualified to perform their assigned duties. NAVFAC P-307 establishes minimum training and competency requirements for these personnel. The benefits of NAVFAC P-307 training are increased awareness by personnel, improved safety, and increased reliability of equipment.

Navy Crane Center currently maintains 17 training courses. Web-based training (WBT) offers a cost-free alternative to instructor-led training. During FY14, approximately 7,700 NAVFAC P-307 courses were completed online, as compared to approximately 6,900 completions in FY13.

The Army, Marine Corps, Air Force, and Coast Guard have all expressed interest in taking NAVFAC P-307 courses. To facilitate these requests and foster collaborative efforts between services and agencies, Navy Crane Center delivers training to these groups as well. And these groups can now access WBT through NeL Direct.

WEB-BASED COURSE COMPLETIONS BY FISCAL YEAR



ADDITIONAL OPERATIONS OVERSIGHT SUPPORT

Navy Crane Center operations oversight personnel provided a variety of WHE program assistance to Navy activities and non-Navy organizations throughout FY14.

Training and Presentations

We continued to transfer Navy Crane Center on-line training to the NNPP website, ensuring the DOE laboratories have direct access to the Navy Crane Center on-line training as these laboratories shift to NAVFAC-307 compliant facilities.

We gave presentations to numerous weight handling program managers stressing the value of a strong surveillance program and the importance of identifying problems at the lowest possible level (safety triangle theory) to reduce the frequency and severity of significant events.

Seabee Support

In 2014, we continued to conduct Seabee battalion weight handling program evaluations at the homeports. Prior to 2013, previous evaluations were conducted at the deployment sites during battalion turnover and some battalions were arriving at the deployment sites without the required training and proficiency. This new evaluation process, coupled with other improvement initiatives, has already demonstrated its value as the deploying battalions have shown increased readiness with regard to their weight handling duties prior to deployment.

Our evaluation teams continued to provide reach-back support to the battalions when required and conducted equipment reviews at remote sites (Rota, Guam, and Okinawa) when we were in those regions in support of other evaluations in the area, resulting in a significant cost savings.

Technical Support

We assisted NAVSEA in evaluating lift plans for the installation and subsequent removal of the upgraded Close in Weapons System and the installation of the Laser Weapon System on a Navy ship in Bahrain for trial deployment. All lifts were successfully completed.

ACQUISITION/CRANE DESIGN ENGINEERING

Safe and effective weight handling operations begin with the acquisition of quality equipment designed to meet the requirements of our re-published design criteria, Navy Crane Center Instruction (NAVCRANECENINST) 11450.2, and life cycle management criteria, NAVFAC P-307. A well-managed weight handling acquisition program is a necessary tenet behind the Navy Crane Center's mission to promote safe weight handling operations at Navy shore activities around the globe.

We develop procurement specifications to meet supported command needs commensurate with operational, schedule and budget constraints. After contract award, we review the contractor's crane designs to ensure full compliance with the specification requirements and applicable commercial standards, and perform field inspections to verify actual equipment condition and performance meet the approved designs. Our focus is to deliver safe, reliable, and maintainable weight handling equipment to Navy shore activities and requesting commands worldwide.

During FY14, we executed awards for 28 cranes valued at \$20.8 million and completed on-site testing and acceptance of 13 cranes valued at \$4.5 million. We provided acquisition assistance on 52 cranes procured by others including participation in the acceptance testing of 7 cranes.

There were 75 cranes under manufacture for Navy Crane Center in FY14, representing total award amounts of \$37 million.

Selected completed acquisition projects of interest:

- Naval Support Activity Bahrain, 75-Metric Ton Mobile Boat Hoist: The boat hoist is used to support maintenance and inspection of surface craft. The diesel-powered, electric operated crane can be controlled from either the operator's cab or remotely by radio controls. The contract included a test weight and spreaders for extending the length between the sling centers to 40 feet. The mobile boat hoist has the capability of traversing a 6 percent grade under full load.



Mobile Boat Hoist, Bahrain

- Naval Air Station Patuxent River, 40-Ton and 30-Ton Hoist and Trolley Replacements: The new equipment provides additional safety measures against loss of control of a load necessitated by the critical operations being performed. Hoists feature: a dual-reeving system with a 5:1 safety factor in each reeving path, coupled by a trolley mounted equalizer bar; a load hook with double the manufacturer's factor of safety against straightening; a hoist drum mounted ratchet and pawl to prevent unintended movement; features to retain the drum in position in the event of drum shaft or bearing failure; hydraulic thruster hoist brakes; a third hoist brake mounted on the flange of the wire rope drum; and an audible alarm that sounds when the hoist slow down limit is activated near the end of hook travel. The equipment can be controlled either from a pendant system or from a fixed station mounted in the overhead next to the crane's power panel. Due to the limited access to the equipment space, removal of the existing trolleys and installation of the new equipment required special effort and reorientation of components while they were lifted, and addition of a roof hatch for access to one trolley.



New Trolley, NAS Patuxent River

- Naval Surface Warfare Center Carderock Division, Two 10-Ton Dual Underrunning Hoist, Underrunning Bridge Cranes: One of the new cranes is cab operated double girder construction, and the other is single girder construction to achieve closer end approaches with the load hook. The new cranes replaced existing 6-on bridge cranes to provide additional capacity and hook coverage for planned operations. Increasing the crane capacity required significant facility upgrades performed by NAVFAC Washington. The project included new patented rail runways

New Crane, NSWC Carderock

- Fleet Readiness Center East, Cherry Point, Five Bridge Cranes: One 15-Ton, one 5-Ton, and three 2-Ton bridge cranes. The 15-Ton and one of the 2-Ton cranes are top running, single girder bridge design with an underrunning trolley and hoist. The remaining two 2-Ton and the 5-Ton cranes are underrunning single girder bridge design with an underrunning trolley and hoist. All of the cranes are electrically powered, controlled from a suspended pushbutton station, and were designed and fabricated to comply with ASME B30 and CMAA requirements. The runway and runway rail for the top running bridge cranes were installed by the facility contractor. The runway for the underrunning bridge cranes was installed by the crane contractor. Navy Crane Center participated in early planning sessions for the facility, facility design reviews and provided

guidance on facility structural steel and electrical power distribution to ensure seamless incorporation of the new cranes into the constructed facility.

- Naval Ship Repair Facility Yokosuka, Detachment Sasebo, 50-Ton Hoist and Trolley Replacement: The assembly and control system were installed on an existing bridge crane to upgrade the existing crane to include microprocessor drive safety features. Replacement of the full hoist and trolley was determined to be more cost effective than addition of components and controls needed to include the safety features. The project was complicated by a low overhead with restricted access.

Acquisition/Engineering Assistance

We provided significant support to the Naval Nuclear Propulsion Program in FY14, including concurrence on the technical specification for the crawler crane for the Kesselring Site, engineering design concurrence for the under gallery deck cranes for Newport News Shipbuilding, and concurrence of technical specifications for other crane projects at Bettis Power Atomic Laboratory.

We also provided support for numerous Military Construction (MILCON) projects. Support included reviewing requests for proposal and facility and crane designs for projects that included cranes, inspecting the cranes during shop testing, and witnessing acceptance testing. Examples of MILCON projects we supported during FY14 include:

- P-100 Naval Nuclear Power Training Command, Charleston, SC – 25-Ton Bridge Crane
- P-112 Naval Air Warfare Center Weapons Division, China Lake, CA – three 3-Ton Ordnance Jib Cranes, a 3-Ton Ordnance Gantry Crane and participation in lift planning for larger capacity lifts at the site
- P-114 Marine Corps Base (MCB), Camp Pendleton, CA – two 7-Ton Bridge Cranes
- P-181 Marine Corps Air Station, Miramar, CA – two 7-Ton Bridge Cranes
- P-320 Pearl Harbor Naval Shipyard, HI – 15 Ton Bridge Crane
- P-383 Norfolk Naval Shipyard, Portsmouth, VA – 50-Ton Bridge Crane
- P-620 Submarine Base, Kings Bay, GA – 15-Ton Bridge Crane
- P-652 Marine Corps Air Station (MCAS), New River, NC - 8-Ton Bridge Crane
- P-676 MCAS New River, NC – 8-Ton Bridge Crane
- P-683/687 MCB, Camp Lejeune, NC – four 7-Ton Bridge Cranes
- P-705 MCB, Camp Lejeune, NC – two 8-Ton Bridge Cranes
- P-834 Naval Base, Kitsap, WA – Long Reach Tower Crane
- P-861 Marine Aircraft Group 24, Kaneohe, HI – 7.5-Ton Bridge Crane
- P-880 Naval Base, Coronado, CA – three 7.5-Ton, one 9-Ton and one 5-Ton Bridge Cranes, and one 5-Ton Jib Crane
- P-904 Marine Aircraft Group 24, Kaneohe, HI – 7.5-Ton Bridge Crane
- P-928 Naval Support Activity, Bahrain – 75-Ton Mobile Boat Hoist

- P-990 Naval Base, Kitsap, WA – two 120-Ton Ordnance Handling Bridge Cranes
- P-990A Naval Base Kitsap, WA – 3-Ton Bridge Crane
- P-991 Fleet Readiness Center East, Cherry Point, NC – three 2-Ton, one 5-Ton , and one 15-Ton Bridge Cranes
- P-1253 MCB, Camp Lejeune, NC - two 7.5-Ton, and 30-Ton, one 20-Ton and two 5-Ton Bridge Cranes
- P-3011 CMMF Andersen Air Force Base, Guam - 10-Ton Bridge Crane

In FY14, we provided consultation on the following prospective crane projects, assisting supported commands in determining the extent and expected cost of work, and assisting in acquisition and related services:

- NAVSUP Weapon Systems Support, Mechanicsburg, PA - Evaluation of six 10-Ton Bridge Cranes and one 200-Ton Bridge Crane
- Strategic Weapons Facility Atlantic, Kings Bay, GA - Refurbishment of two 120-Ton Bridge Cranes
- Marine Corps Logistics Base, Albany, GA - Inspection and operational testing of a 35-Ton Bridge Crane
- Marine Corps Support Facility, Blount Island, FL - Approved the design of 25-Ton Bridge Crane and 50-Ton Bridge Crane
- Military Ocean Terminal, Concord, CA - Report of required repairs of two Container Cranes

We provided “reach-back” support to NAVFAC Atlantic with a NAVAIR hangar inspection in Atsugi, Japan. We provided one of our structural engineers to be part of the team that investigated the hangar mishap at Fleet Readiness Center Western Pacific, Atsugi, Japan.

Guide Specifications

Unified Facilities Guide Specifications (UFGS) are provided for the procurement of general purpose cranes with rated capacities less than 20,000lbs. The guide specifications are intended to be used by building designers for cranes included in building construction contracts and by user activities as a base specification for equipment procurement. These joint forces documents are located on the Whole Building Design Guide web site, www.wbdg.org. A guide specification for jib cranes is in final review and is expected to be uploaded to the WBDG web site in FY15. This specification was requested by several supported commands to guide self-procurement of these items. The Design Division continued to review demand for specialized specifications, such as workstation cranes, and will propose creation of new guide specifications when appropriate.

ASME B30 Crane Safety Standards Committee

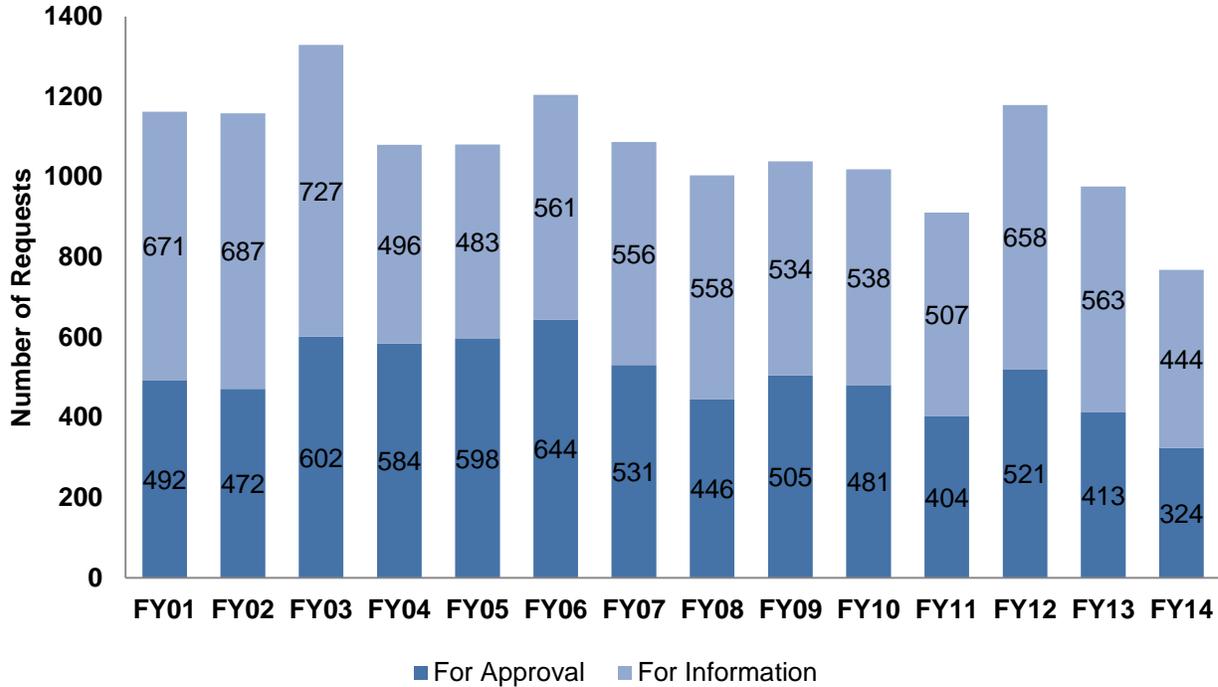
In FY14 Navy Crane Center personnel participated in the development of revisions to the following ASME B30 standards: B30.1, Jacks, Industrial Rollers, Air Casters, and Hydraulic Gantries; B30.5, Mobile and Locomotive Cranes; B30.9, Slings; B30.10, Hooks; and B30.21, Lever Hoists. In addition, work was nearly finalized for publication of revisions to the following standards in 2015: B30.4, Portal and Pedestal Cranes; B30.6, Derricks; B30.8, Floating Cranes; B30.14, Side Boom Tractors; B30.17, Overhead and Gantry Cranes (Top Running Bridge, Single Girder, Underhung Hoist); B30.22, Articulating Boom Cranes; B30.26, Rigging Hardware; and B30.28, Balance Lifting Units

IN-SERVICE ENGINEERING

Crane Alterations

Crane alterations are required for any changes in the original manufacturer's weight handling equipment (WHE) design configuration. They include replacement of parts and components not identical with the original, addition of parts or components not previously part of the equipment, removal of components, and alteration of existing parts and materials. Navy Crane Center approval is required for alterations to load bearing parts, load controlling parts, and operational safety devices. We also perform a review of locally approved alterations and archive them for future reference. Local approval is permitted for changes to WHE not involving load bearing parts, load controlling parts, or operational safety devices. Details of the crane alterations processed in FY14 are available on the Navy Crane Center website located at <https://hub.navfac.navy.mil/webcenter/portal/ncc>.

CRANE ALTERATION REQUESTS



Configuration Management

Configuration Management is required by NAVSEA for Category 1 Naval shipyard cranes obtained through multi-crane procurement contracts. Craft 60-ton portal cranes (23 cranes), AmClyde 171.5-ton portal cranes (3 cranes), Westmont 100-ton floating cranes (12 cranes), Westmont 60-ton portal cranes (8 cranes), and Samsung 60-ton (10 cranes) and 151.2-ton (2 cranes) portal cranes are currently designated for configuration management.

During FY14, the Navy Crane Center issued one mandatory crane alteration on Craft 60-ton portal cranes, one on Westmont 60-ton portal cranes, one on Westmont 100-ton floating cranes, six on Samsung 151.2-ton portal cranes, and six on Samsung 60-ton portal cranes. Details are available on the Navy Crane Center web site located at <https://hub.navy.mil/webcenter/portal/ncc>.

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 activities other than the reporting activity, we issue a Crane Safety Advisory (CSA) or an Equipment Deficiency Memorandum (EDM). Generally, 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/non-load controlling parts. In FY14, we issued ten CSAs and two EDMs. Details are available on the Navy Crane Center web site located at <https://hub.navfac.navy.mil/webcenter/portal/ncc>.

Floating Crane Program

The Navy Crane Center assists NAVSEA PMS 325 in overseeing the Navy's floating crane program to ensure proper asset allocation. To support the Navy's evolving missions, it is essential to ensure proper equipment is available for utilization.

At the end of FY14, there were 14 floating cranes in the active inventory. Formal requests were sent to PMS 325 to excess two of these (YD 200 and YD 247) from inventory. Navy Crane Center concurred with these requests. Final disposition of YD 200 and YD247 is pending.

In conjunction with SUBASE New London and NAVFAC Midlant personnel, our engineers developed a technically comprehensive action plan to troubleshoot ongoing drive issues on YD 250 at SUBASE New London. A team, which included an NCC representative, was sent to New London to thoroughly inspect and troubleshoot the control system. Navy Crane Center in-service engineers were able to troubleshoot, identify the root cause, and resolve problems on the electronic drive controls. The crane was operated in excess of 100 hours with no control system problems. In June 2014 the crane was successfully load tested and certified for use. This successful effort resulted in cost avoidance to the Navy by not having to replace the existing controls with new electronic drive controls.

Additional In-Service Engineering Support

We provided engineering support to Portsmouth Naval Shipyard to determine the extent of the repairs, inspections, and testing necessary to return a portal crane to service after the crane experienced damage during testing of the emergency dynamic braking on the boom hoist. Our engineers reviewed the calculations and inspections performed and issued a formal letter to the shipyard, concurring on the analysis and recovery actions.

We provided guidance and support in developing a plan for an engineered overload of a portal crane to support the emergent replacement of the main reduction gear on a Navy ship. NCC reviewed information from the supported command and evaluated multiple lifting options prior to approving the planned overload in accordance with NAVFAC P-307, paragraph 3.5.7, to support the emergent work.

INFORMATION TECHNOLOGY

NCC Public Website

As part of the NAVFAC wide initiative, we completed the migration of the NCC public website from the NAVFAC Oracle Portal to CNIC's Adobe CQ system. This involved updating and adding new pages, such as a revised organizational structure, the Safety/Training program initiative, and P-307 web training for NAVFAC personnel. Our public affairs officer, in coordination with our command webmaster, reviewed our public content to ensure it met accuracy, policy, security, and propriety requirements directed by Navy web and public affairs instructions.

The Navy Crane Center's section of the public website is located under the "NAVFAC Worldwide" and "Specialty Centers" tabs from the NAVFAC Enterprise Portal. We have populated this section with information cleared for public release. This includes: general information such as mission, vision, locations, points of contact; the Director's biography; a showcase for various types of cranes; contact information; resources such as NAVFAC P-307 related information, Weight Handling Accident Prevention, Information, P-307 training information, and publications and reports that provide the global Navy shore activities with valuable information to assist them in improving their weight handling programs. The NCC Portal web-site is an effective tool, both as a means to communicate with our global clients and to facilitate improvements in all of our business practices.

SAFE AND RELIABLE WEIGHT HANDLING PROGRAMS



AT NAVY SHORE ACTIVITIES

ESSENTIAL ENABLER FOR FLEET READINESS