Naval Support Activity Mechanicsburg Deploys "First of its Kind" Overhead Crane Retractable Rigger Fall Protection System

According to recent OSHA and Bureau of Labor statistics, workplace fall-related deaths in the industrial and construction sector are second only to occupational-related traffic accidents. When it comes to industrial fall protection systems while challenges exist in designing systems that facilitate workflow, worker protection and safety have to come first: failure is not an option.

Between March 2006 and April 2007, safety program personnel at the Naval Support Activity (NSA) Mechanicsburg, PA culminated months of planning and design by successfully deploying a first-of-its-kind retrofit of one of the base's large-tonnage overhead cranes to help enable mission accomplishment and protect workers from falls.

NSA Mechanicsburg encompasses over 800 acres and features 35 commands that occupy close to nine million square feet of combined administrative, industrial, and warehousing space. The base, which is the largest in Central Pennsylvania, employs about 5,000 civilians, military, and contractor personnel. Approximately eight million square feet are occupied by industrial and warehousing end uses.

There are a wide range of fall protection systems in use on the base that protect workers from falls from a variety of structures such as flat roofs air handling units, cooling towers, saw dust collectors, and overhead cranes. If put end to end, base-wide fall protection systems would span over three miles.

Each fall protection system provides safety regulation-compliant measures for protecting personnel. The particular system used for a job is dependent on the actual work to be performed, the structure being worked on, or the frequency of the work. Qualified or competent personnel must oversee all systems and most equipment used at NSA Mechanicsburg. There are specific training requirements on use, care, handling, erecting, dismantling and advising employees of hazards associated with these types of systems and equipment. In addition, a fall protection and prevention plan specific to the physical site must be in place, developed and overseen by a competent person.

Overhead cranes, which are used at NSA Mechanicsburg to move very large ship parts, require a special type of fall protection solution. In the case of the base's 200-ton overhead crane, there was a clear need to improve fall arrest systems to protect riggers from potential serious fall

hazards at heights up to 25 feet in various weather conditions as they loaded and unloaded massive components from railcars and trucks.

Riggers handle the attaching devices to materials moved by cranes. These devices are called rigging and include slings, shackles and other devices required to move the load. As shown in the photo at right, the 200-ton crane stands 60 feet high and operates with a cab-controlled trolley; the trolley rides on top of the crane bridge and contains the crane's lifting mechanisms and controls. The cab traverses about 35 feet with a motorized lift hook which traverses about 20 feet perpendicular to the trolley. The crane is manned by 10 riggers.

200-ton Ederer overhead bridge crane at the Naval Support Activity Mechanicsburg before it was outfitted with self-retractable lifeline fall protection devices.

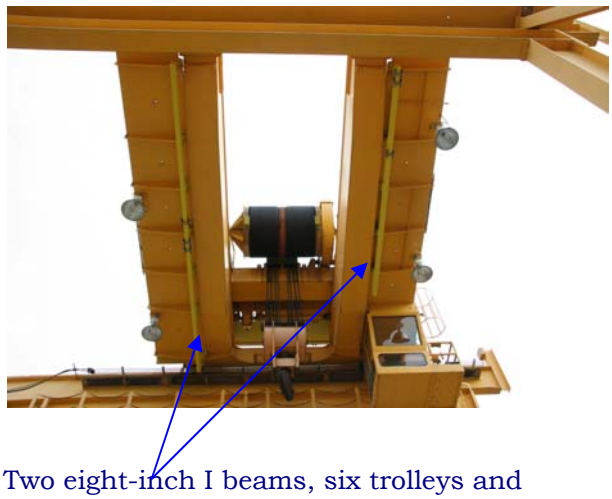
Historically, riggers either used a 40-foot aerial work platform and a forklift with a secured safety pallet to elevate them upward, or they climbed up the component that was being loaded or unloaded to attach the rigging. The riggers had to climb out onto the component without any fall protection to attach their rigging devices to the crane hook, creating a potentially serious fall hazard.

To help alleviate the problem, early in 2006, the base's Regional Safety Office submitted a Hazard Abatement (HA) project to the Naval Facilities Engineering Command (NAVFAC) to secure the necessary funds to outfit the crane with a *retractable fall arrest system*. An HA project is a special Navy funding request vehicle to obtain funds to correct serious safety and health workplace conditions.

In May of 2006 NAVFAC approved the project for the design, installation, and fabrication of a retractable fall arrest system. Base safety personnel, riggers, operators, and the crane manufacturer worked closely with the chosen fall protection contractor to develop a fall protection solution for the overhead crane. Ultimately, the team selected a *self-retracting lifeline* (SRL) system. This system, which has a retractable line similar to an automotive seat belt, had never been used before on this or any other Navy base on this particular type of bridge crane.

The system was engineered to safeguard riggers and give them free movement to connect and detach the crane hook from its loads. Primarily, the retrofit consisted of two eight-inch wide "I" beams

equipped with trolley stops permanently mounted underneath the crane's bridge. A total of six trolleys were positioned on the "I" beam track, three on each beam. A six-foot lanyard equipped with a snap hook on each end is attached between the trolley and a 50-foot self-retractable lanyard, which reaches to ground level. Lanyards are connected to the harness. The rigger is attached at one end of each lanyard, and the other end is attached to a connecting point on the device. Riggers are attached to the trolley by the retractable line. The system is self retracting to keep constant tension on the rigger's harness to immediately stop the fall. In the event of a fall, the line is retracted like a seat belt to arrest the fall.



Two eight-inch I beams, six trolleys and trolley stops attached to the underbelly of an Ederer 200-ton overhand bridge after retrofit with self-retractable lifeline fall protection systems.

Each rigger was provided with a full-body fall protection harness with individual storage bag, and the riggers received four hours of training to certify them on using and caring for their harnesses.

When riggers use the system they will use a 40 foot lift to attach the trolleys and the SRLs to the crane's beam and then attach tag lines to pull the 50 foot SRL cable to the ground so they can connect to the SRL system. Once the riggers are attached to the SRL, they can hook up or remove their rigging and load or unload components from the crane hook.

The system allows riggers the flexibility to move around but can't cross the SRL cable. If a rigger falls, the system allows a free fall distance between three and six inches. This allows the rigger to perform a self rescue to bring him out of the fall. The tag lines will also be used to return the SRL cable to the SRL.

The total "turn key" cost of the project, including training, was about $200,000, but the dollar value by no means is an accurate measure of the system's true

NSA rigger Paul Kerr tests out self-retractable lifeline fall protection recently installed to protect riggers on a 200-ton overhead bridge crane.

worth. Proper fall protection is certainly a challenge and an economic consideration in the short term, but will pay off in the long run with minimized risk of dangerous falls, increased productivity, increased morale, less down time and minimization of worker's compensation costs.

For more information about this project please contact the NSA Mechanicsburg Safety Office at 717-605-4867.