

ERGONOMICS INTERVENTION AT COMNAVREG SW SAN DIEGO MAIL CENTER PREVENTS INJURIES

The *Navy's Ergonomics Program* was established to reduce the frequency and severity of Work-related Musculoskeletal Disorders (WMSDs), a group of disabilities that results primarily from exposure to physical risk factors in the work environment. Weakness and discomfort, which are symptoms of WMSDs, may improve when early intervention leads to medical treatment and changes in work habits or the risk factors in the work environment that led to the symptoms are minimized or eliminated. Reducing WMSDs is accomplished by utilizing [ergonomics](#) principles to redesign work tasks and/or workstations, and by introducing procedures and tools that minimize risk factors.

Navy Occupational Safety and Health policy requires that [industrial hygiene](#) surveys be conducted to identify risk factors in Navy workplaces. A routine industrial hygiene survey identified several physical risk factors at the Commander Navy Region Southwest (COMNAVREG SW) San Diego Dockside Mail Center. COMNAVREG SW San Diego collects and distributes mail, in accordance with U. S. Postal Service regulations, at the Naval Station (NAVSTA) Dockside Mail Center and at three other Official Mail Centers in the region. Mail to and from NAVSTA San Diego and ships docked there is processed at the Dockside Mail Center.



Workers positioned heavy portable ramps to connect trucks to the Dockside Mail Center loading dock.

Processing the large volume of mail handled at NAVSTA San Diego Dockside Mail used to put its mail handlers at risk for WMSDs. Mail handlers routinely unloaded mail trucks, lifting and carrying packages weighing up to 70 pounds. During the sorting process, the mail earmarked for various vessels was placed in bulk mail containers (one for each vessel) for loading on delivery trucks. The delivery trucks were various sizes and heights and consequently they did not always marry well to the back of the Dockside Mail loading dock. Mail handlers used to lift, carry, and position portable ramps into place to connect the loading docks to the mail trucks. The handlers then pushed the bulk carts of mail weighing as much as 1,500 pounds up the ramps and into the trucks. Pushing the bulk carts up an

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Pushing bulk carts put mail handlers at risk for injuries.

incline put the workers at risk for back and shoulder injuries as well as crushing injuries if they lost control of a bulk mail cart.

Mail bins that workers filled and emptied for the general sorting process were not properly sized. Because the bins were very deep, workers had to continually bend over and reach into them to retrieve the mail. Mailroom employees assigned to the customer service area also had to employ long



Mail handlers employed long reaches to place packages on a scale; computer and keyboard were non-adjustable and placed to side causing workers to twist their torsos to talk to customers.

reaches across the service counter to lift heavy packages at arm's length and then place the packages on a scale to obtain an accurate weight. After the transaction, the mail handlers manually carried the parcels to the sorting carts and placed the parcels in the carts. Lifting at arms reach, compared with keeping arms close to the body, greatly increases the amount of loading or force on the spine, increasing the risk of injury.

The Dockside Mail workstation computer monitor and keyboard could not be adjusted to suit users' heights and were situated to one side of the counter resulting in awkward reaches to work with them. This placement of the keyboard and monitor also caused workers to have to twist their torsos to

communicate with customers on the other side of the counter. Muscles work less efficiently in awkward postures (twisting the body or reaching at arms length) when compared to working in neutral postures. A neutral posture is the resting length of each muscle group which results in the greatest amount of strength, control, and speed with the least amount of effort and strain.

Another ergonomic risk factor within the Dockside Mail customer service area involved seating. Mail handlers sat on stools that did not provide adequate back or leg support. Workers would sit with their feet dangling unsupported creating contact pressure on the backs of their knees, which leads to decreased circulation. Inadequate back support can result in lower back pain. Mail handlers seated in chairs did not have room to place their legs under the customer service counter without assuming awkward postures such as sitting with their torsos twisted or with their legs splayed.



Stools did not provide adequate leg and back support

The Naval Facilities Engineering Command (NAVFACENGCOM), which manages the Chief of Naval Operations (CNO) *Hazard Abatement and Mishap Prevention Program* (HAMPP), oversees and funds the



correction of identified high-risk safety and health deficiencies that exceed the funding capabilities of Navy shore activities that request such assistance. COMNAVREG SW San Diego was funded through the HAMPP to improve its work environment by identification and classification of ergonomics risk factors at its Dockside Mail and Official Mail Centers. Funding was also provided to resolve these risk factors through implementation of suitable ergonomics interventions. A Certified Professional Ergonomist from the Navy Ergonomics Program teamed with the Dockside Mail Center's Chief and the Command Industrial Hygienist to recommend ergonomic interventions that minimized or eliminated the risk of WMSDs among COMNAVREG SW San Diego's Dockside Mail staff.

The Dockside Mail customer service area was completely gutted and re-



Counter height and adjustable computer keyboard allow work in neutral position; keyboard is directly in front of worker eliminating twisting of the worker's torso.

designed. The modifications lowered the counter height to encourage working in a neutral posture. The computer keyboard and monitor are now positioned directly in front of the mail handler, instead of off to the side. The keyboard can be adjusted to the working elbow height (neutral arm posture) of each mail handler. The mail handler is now able to face the customer during the entire transaction without twisting. The redesign eliminated working in awkward postures.

New *sit/stand* or *lean* stools were purchased for the customer service work area. Leaning on one of these stools keeps the worker at nearly the same eye height as the customer but takes about two thirds of the pressure off the lower back. The lean stool also makes it very easy to get up and move around, which is important for tasks in the customer service area. Frequently moving around gives the muscles a chance to recover and improves blood flow from the legs by preventing pooling of blood in the feet.

The new layout of the customer service area allows customers to place their packages directly on the postal scale. After the transaction, the mail handler then slides the parcel from the scale, across a conveyor surface, and onto an adjacent scissors lift table without ever lifting the package. The new design virtually eliminates the previous situation of mail handlers having to lift heavy packages during the customer service transaction.



Workers can slide parcels from scales across a conveyor surface and onto a scissors lift table without manual lifting.

The overall customer service area redesign provides a better-organized and more efficient workstation. The improvements reduced mail handlers' exposure to physical risk factors, which in turn reduces the likelihood of injury. There are less wasteful motions; lifting has been virtually eliminated; and the workers no longer need to twist around to assist the customers.



Scissors lift table decreases lifting in awkward postures.

Additional ergonomic changes at Dockside Mail included purchase of improved material handling equipment such as tilting package carts and mail sorters, mobile scissor lift tables, spring loaded mail hampers, and an automated cart-tugging device. These tools that are designed to fit the work to the capabilities of the user reducing the need for forceful exertions due to heavy lifting, did away with extended reaches and eliminated working in unnatural postures.

The tilting mail sorters and package carts angle towards the worker, which eliminates the need to bend over and reach into the old, deep mail carts to handle heavy or numerous items at arms length and in awkward postures. The mobile scissor lift tables and spring loaded mail hampers decreased exposure to lifting in awkward postures and repeated bending. When items are handled at elbow or waist height there is less strain on the musculoskeletal system because the muscles are at their resting length and can perform most efficiently.



Tilting package carts angle towards the worker, eliminating bending and awkward postures.

Using the automated cart tugging device reduces workers' risk of back injury from manually pushing and pulling heavy carts to and from, and up and down loading docks. The loading dock improvements include ramps that are lowered into place hydraulically, eliminating the need to move dock boards manually.



Automated tugging device reduces risk of back injury.



New loading dock ramps are hydraulically controlled eliminating need to manually move dock boards.

According to Bureau of Labor Statistics data, the average cost of a *Work-Related Musculoskeletal Disorder* was \$13,811.00 in 2002 (the year the project was submitted). Assuming the COMNAVREG SW San Diego Dockside Mail and Official Mail Centers ergonomics interventions prevent only three occupational injuries every year and that there will be no increase in the cost of medical treatment or rehabilitation, the Navy would save \$41,433.00 every year for a return on investment in 519 days, or approximately one year and five months.

Workers at COMNAVREG SW San Diego Dockside Mail find the ergonomics improvement in their work environment to be a vast improvement. They can avoid working in awkward postures, heavy lifting, pushing and pulling heavy equipment and are therefore less likely to sustain injuries. The changes at Dockside Mail reinforce the principle that ergonomics interventions in the workplace increase productivity and efficiency, reduce errors and waste, increase worker satisfaction and workplace morale, and ultimately improve overall quality of work and work products.

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