

Rollertop Hydraulic Lift Table Reduces Injuries and WMSDs at Naval Intermediate Maintenance Facility, Bangor

Shipwrights at Naval Intermediate Maintenance Facility (NAVIMFAC) Bangor, WA provide wooden structures for ship and submarine repair and perform other carpentry related tasks such as erecting scaffolding for use during repair tasks. The task that shipwrights in NAVIMFAC Shop 64A used to dread most was cutting keel blocks. Keel blocks are large wooden blocks that each weigh over 300 pounds. Ships rest on the keel blocks in dry dock while NAVIMFAC workers maintain and repair the ships. In the picture at right, Shipwright, Keith Griepentrog, is seen holding one end of a 300-pound keel block.



A shipwright used to grasp one end of a wooden keel block, supporting its weight with his upper body, while slowly feeding the block through a band saw to ensure that the cut would be precise. Accuracy of the keel block cut is necessary to ensure that the ship is firmly supported while it is in the dry dock. By the time he had cut through the block, a shipwright was fatigued from using his hands, arms, back, and shoulders to guide and support the heavy keel block. Guiding and supporting the weight of the keel block increased a shipwright's risk for work-related musculoskeletal disorders (WMSDs) of the back, hands, arms, and shoulders.

Supporting keel blocks while feeding through a band saw increased risk of WMSDs

Work tasks that require repetitive motions and/or using one group of muscles for long periods during each day's work shift tend to fatigue those muscles. This overburdening may lead to a WMSD, a disability that usually involves weakness and discomfort, commonly in the wrists, arms, shoulders, neck, legs, or back. The discomfort often improves after discontinuing activities that weaken the affected muscles and getting medical treatment for the WMSD.

During an ergonomic assessment at NAVIMFAC, a hazard abatement ergonomics team from Naval Facilities Engineering Command (NAVFACENGCOM) observed that keel block cutting put shipwrights at

risk for WMSDs. The NAVFACENGCOM ergonomics team provided recommendations for decreasing ergonomic risk factors associated with cutting keel blocks. Ergonomics is the science of fitting the work to the worker, instead of requiring the worker to adapt to existing working conditions. The goal of an ergonomics program is to reduce the frequency and severity of WMSDs by redesigning work tasks or workstations using procedures and tools that minimize the risk of WMSDs. Work tasks, equipment, and tools that are ergonomically designed help to reduce the risk of work-related injuries and WMSDs by making it easier for the worker to avoid repetitive motions, awkward positions, and unnatural postures. Applying ergonomic principals in the workplace also increases productivity and efficiency, reduces errors, improves quality, reduces waste, increases employee retention and satisfaction, and ultimately improves work and products.



Shipwrights using rollertop hydraulic lift table no longer have to support weight of keel blocks

Shop 64A's shipwrights and a NAVIMFAC Bangor safety specialist reviewed NAVFACENGCOM's findings and recommendations for ergonomic improvement. With input from the shipwrights on their comfort levels, and with assistance from NAVIMFAC's safety specialist, it was agreed that the best ergonomic solution for the shipwrights' keel block-cutting task was a rollertop hydraulic lift table.

The rollertop hydraulic lift table is a table that has rollers on top that hold and guide the keel blocks into the saw blade. The lift table is initially positioned at pallet height so that workers can slide a keel block directly from a pallet onto the table instead of manually lifting the block. Using hydraulics, the lift table then raises the keel block to the height of the band saw. The shipwrights no longer need to hold the end of the keel block while the band saw cuts through it. The full length of the keel block fits on the table and the rollers allow the worker to guide the block through the saw blade without carrying its weight, as shown in the picture above, left.

The rollertop hydraulic lift table is a welcome addition for the shop; it prevents fatigue and back injuries, increases productivity, and is

expected to pay for itself through reduction in the number of WMSDs within two years.

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