

Naval Facilities Engineering Command Ergonomic Risk Assessment

Shipping and Receiving

Introduction

This report summarizes the ergonomic risk assessment conducted in July of 2004. The shipping and receiving area was observed. This assessment is based upon interviews with supervisor, safety personnel, and employees as well as an evaluation by the Naval Facilities Engineering Command (NAVFACENGCOM) Hazard Abatement Ergonomist.

The shipping and receiving area was observed in order to determine sources of ergonomics stress and make recommendations to reduce the risk of work-related musculoskeletal disorders (WMSDs) and improve safety, health and productivity. Musculoskeletal Disorders (MSDs) are injuries and illnesses that affect muscles, nerves, tendons, ligaments, joints, spinal discs, skin, subcutaneous tissues, blood vessels, and bones. Work-Related Musculoskeletal Disorders (WMSDs) are:

- ∞ Musculoskeletal disorders to which the work environment and the performance of work contribute significantly or
- ∞ Musculoskeletal disorders that are aggravated or prolonged by work conditions.

Recommendations for the command to further reduce the probability of injury include new equipmentⁱ and administrative controlsⁱⁱ. Recommendations are included with as much vendor informationⁱⁱⁱ as possible to assist in the evaluation of products and services. Input gathered from the workers, safety specialists, and other personnel to evaluate equipment before purchasing is recommended. This process will increase product acceptance, test product usability and durability, and take advantage of employee experience.

Hazard Abatement and Mishap Prevention projects can be submitted for fiscal year 2006 funding consideration if received by February 28 2005. Naval Facilities Engineering Command (NAVFACENGCOM) manages the Hazard Abatement and Mishap Prevention Program (HAMP), which is a centrally managed fund to correct safety and health deficiencies beyond the funding capabilities of the activity. Information about the HAMP program can be found on the Naval Facilities Engineering Command web site www.navfac.navy.mil/safety and in OPNAVINST 5100.23F. Ch 12 Hazard Abatement.

Shipping and Receiving

Purpose of the Operation: Responsible for receiving as well as packing and crating material for shipment

Population: 1 Woodworker and 4 Material Handlers

Injury Data: No recorded injuries

Description of the Operation: Deliveries are received from Federal Express and United Parcel Service each day. Approximately five trucks arrive each day carrying 30 to 40 parcels. Incoming boxes are loaded on pallets which are then transported to the stock room with a pallet truck, figure 1. Employees regularly sort packages while on the pallet, figures 2 and 3. Stock is sorted into hampers to be taken to the inventory carousel. Retrieving items from the bottom of the hamper requires the worker to bend into the hamper, figure 4.



Figure 1: FedEx arrival



Figure 2: Sorting on pallets



Figure 3: Lifting boxes from pallet



Figure 4: Reaching into hampers

One woodworker is responsible for packaging and crating aircraft parts and loading them into trucks. The employee reported that the hardest part of his job is building crates and putting the parts in them. The worker builds approximately two crates per week. The largest crate is about 9.5' x 8' x 1' and the largest part is about 1200 lbs,

figures 5 and 6. Workers use forklifts and hand trucks when possible to move the aircraft parts which doesn't assist with loading them into the crates for shipment.



Figure 5: Aircraft part for shipment



Figure 6: Crate for aircraft part

Ergonomic issue description: The employees in the Shipping and Receiving area perform a lot of lifting and bending in order to sort packages and build crates for shipment.

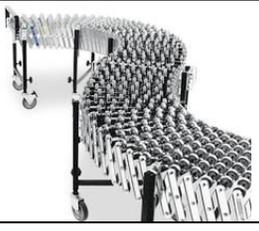
Forceful Exertions and Heavy Lifting: Lifting heavy packages and aircraft parts can require excessive force. Exerting high forces can contract muscles to their maximum capability which leads to muscle fatigue and possible damage to the muscles and other supporting tissues if adequate rest is not provided. Heavy lifting can strain the back and place the worker at risk of injury.

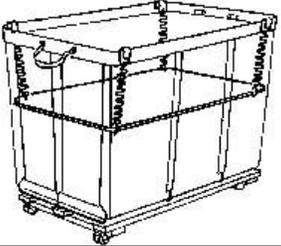
Awkward Postures: Employees perform repeated bending of the torso while sorting packages on pallets and emptying hampers which places strain on the lower back. Repeated awkward postures restrict blood flow and can cause muscle fatigue as well as place the employee at risk of developing WMSDs. Awkward postures may also put additional strain on the tendons, which can cause inflammation, swelling, restricted movement, and pressure on nearby nerves and if occurring often can lead to WMSDs.

Recommendations- Refer to Table 1 for vendor information.

- ∞ A height adjustable cart can be used for sorting and transporting stock to reduce heavy lifting and carrying.
- ∞ A flexible conveyor could be used to unload trucks at the dock and move parcels to the stock room to avoid sorting on pallets.
- ∞ Retrofitting the existing hampers or procuring new hampers with self-elevating bottoms will reduce the need for workers to reach into the bottom.
- ∞ Height adjustable pallet jacks would reduce the need to bend while lifting boxes off of pallets.
- ∞ A lift and tilt table would assist with building large crates in order to reduce bending and promote a more neutral work postures.

- ∞ A mobile lift will reduce heavy lifting of aircraft components into crates.
- ∞ A packaging station with anti-fatigue matting will reduce reaching and walking for parts while packing items for shipment.

Table 1: Material Handling Equipment				
Description	Vendor	Product	Estimated Cost	Figure
Height Adjustable Carts *price depends on size	Lab Safety 1-800-356-0783	Bishamon Mobile Scissor Lift Tables 330 lb. Capacity #18771	\$560	
	Grainger	Manual Hydraulic Elevating Scissor Cart 400 lb. Capacity #3KR46	\$378	
	Global Equipment 1-800-645-1232	Scissor Lift Table 660 lb. Capacity #GK954850	\$367	
	C&H 1-800-558-9966	Mobile Scissor Lift Truck 330 lb. Capacity 71-525A	\$568	
	Peaklogix 703-819-6061	Adjustable height work carts- 32"x68" platforms. 1,000 lb capacity. Hydraulic Operation	\$688	
Flexible Conveyor System	Lab Safety 1-800-356-0783	Flexible Portable Conveyor *price depends on size	\$481 (9 ft) \$1165 (25 ft)	
	Grainger	Skate wheel conveyor	\$757-\$2250	
	C&H 1-800-558-9966	Expandable/Portable Conveyor	\$747-\$3264	
	Peaklogix 703-819-6061	Powered expandable conveyor. Expanded length 48', compacted length 16'. Elevations from 31.5" to 44.5". 100 lb. capacity per linear ft. Electronic photo eye.	\$14,110	

Hampers	Postal Products Unlimited 1-800-229-4500	Elevated Basket Truck	\$70-\$85	
	Postal Products Unlimited 1-800-229-4500	Basket Truck Elevated Spring Platform	\$129-\$218 \$36-\$61	
	Postal Products Unlimited 1-800-229-4500	Heavy-Duty Spring Loaded Mail Cart	\$349	
	Grainger	Mail Hamper Spring Platform	\$182-\$335 \$144-\$151	
	McClure Industries 1-800-752-2821	Spring Platform Cart	\$355-\$632	
	Datamation Systems, Inc 1-201-732-3824	Ergonomic Auto Level Cart	\$935	
	Charnstrom 1-800-328-2962	Mail Hamper Spring Platform	\$198-\$274 \$60-100	
	Peaklogix 703-819-6061	Hamper Trucks- 24 Bushel capacity. Heavy duty casters. Spring platform lift.	\$124	
Pallet Jacks	Lab Safety 1-800-356-0783	High Lift Pallet Truck	\$706	
	Grainger	Electric Portable Scissor Lift	\$2640	
	Global Industrial 1-800-645-1232	Heavy duty- High Lift Skid Truck	\$539	
	Peaklogix 703-819-6061	Electric Portable Scissor Lift- 2200 lb. capacity. 115 V battery charger. Lowered height 3.5", raised height 31.5"	\$2940	

Lift and Tilt Table	C&H 1-800-558-9966	ECO A Spacesaver lift and tilt table	\$2867	
	Grainger	Scissor Table Lift and Tilt	\$5297	
	Global Industrial 1-800-645-1232	Floor Level Lift and Tilt Table	\$4179	
	Peaklogix 703-819-6061	Lift/Tilt Table- 4,000 lb. capacity. Platform size 66"x66", lowered height 11" and raised height 39". Tilt to 45 degrees.	7,295	
Mobile Lift	Grainger 757-855-3153	Hydraulic Engine Mobile Crane Hydraulic Space Saver Engine Mobile Crane, Capacity 2200/1650/1100 Pounds,	\$516	
	Global Equipment 1-800-645-1232	Mobile-telescoping, crane. Heavy-gauge steel. Folds to a compact 62 1/2"H x 32 1/2"W x 39"D. Manual hydraulic pump and 11" hook chain allow multiple uses. Telescoping four-position boom has 1000-4000 lb. capacity range.	\$239	
	Peaklogix 703-819-6061	Mobile Hydraulic Crane, 2,000 lb capacity with boom fully extended to 84". Lift height is 96" to 126". Narrow aisle capacity.	\$1100	
	Peaklogix 703-819-6061	Mobile hydraulic stacker/lift- 1500 lb. capacity. Adjustable lift straddle legs. Lift height 3" to 144". Built in battery charger.	\$3735	

Packaging Station	PeakLogix	Adjustable height packing station. 69" wide, 33" deep and adjustable height. Adjustable full width cantilever shelf with drawer, storage cabinet and tape machine tray.	\$1998.00	
	Lab Safety 1-800-356-0783	Packaging station	\$1286	

ⁱ Equipment purchase without proper and repeated training will not mitigate risk and may in fact increase hazards.

ⁱⁱ Administrative controls are management-controlled work practices and policies designed to reduce exposures to work-related musculoskeletal disorders (WMSDs) hazards by changing the way work is assigned or scheduled. Administrative controls reduce the exposure to ergonomic stressors and thus reduce the cumulative dose to any one worker. Examples of administrative controls that are used in the ergonomics context are employee rotation, employer-authorized changes in the pace of work, and team lifting.

ⁱⁱⁱ This report does not constitute an endorsement of any particular product. Rather, it is a recitation of how Navy personnel have addressed a particular work place safety issue. Neither the Navy nor its employees and agents warrant any product described in this report for any use, either general or particular.