

Fleet Readiness Center (FRC) East Uses Lazy Susan Design to Prevent Work Related Musculoskeletal Disorders

Fleet Readiness Center (FRC) East in Cherry Point, NC is one of six fleet readiness centers operated by the U.S. Navy. The Center employs about 4,000 civilian, military, and contractor personnel, who work in a wide variety of skilled technical and professional positions. As a service provider specializing in support of Marine Corps aircraft, engines, and components, FRC East is the only



FRC East has the capabilities to perform major airframe modifications and repair for a wide variety of aircraft, including the AV-8B-Harrier shown here.

source of repair within the continental United States for many jet engines, rotary wing engines, and turbofan vectored thrust engines.

Many of the maintenance and repair tasks performed on aircraft engines in the FRC East work shops involve repetitive motions, forceful exertions, and working in awkward postures for long periods. When work tasks and workstations are not adequately configured to accommodate the worker's physical requirements, the worker is at an increased risk for

occupational injuries and [work-related musculoskeletal disorders](#) (WMSDs).

The goal of the Navy's *Ergonomics Program* is to reduce the frequency and severity of WMSDs by redesigning work tasks or workstations through the introduction of procedures and tools that minimize [ergonomics](#) risk factors. These types of risk factors are often resolved by introducing ergonomics interventions. Interventions may take the form of equipment that moves or adjusts heavy or awkward items so that workers don't overexert themselves by manipulating the items manually. Interventions can also eliminate the need for working in awkward postures and/or employing repetitive motions to carry out work assignments.

During a site visit to FRC East, an ergonomist on staff with the Navy's Ergonomics Program identified ergonomics risk factors in FRC East workshops. To obtain feedback on how to mitigate or eliminate these ergonomics risk factors, group discussions were held with workshop artisans, shop supervisors, shop engineers, and the FRC East industrial ergonomist. Several solutions to eliminate ergonomics risks in FRC East workshops were discussed during the meetings. Workshop artisans agreed that *Lazy Susans* designed by artisans, the FRC East industrial

ergonomist, and individual shop engineers appeared to be the most helpful solution for avoiding WMSDs. The Navy Ergonomics Program ergonomist and the shop engineer gave the approval for testing Lazy Susan designs in several FRC East workshops.

Following testing, artisans made the final decision as to which Lazy Susan designs worked best for their particular workshops. The command's safety office worked with FRC East's commanding officer to develop an ergonomics funding budget for purchasing the chosen Lazy Susan designs. Once the Lazy Susans were purchased, they were supported by the FRC East Safety Office, Ergonomics, and Engineering departments. [Note: for information on the best way to set up an ergonomics budget at your command, contact the POC listed at the end of this success story].

Lazy Susan electric adjustable tables have now been developed and installed in many of the shops at FRC East to reduce the risk of developing WMSDs. The Lazy Susans come in varying sizes and can be designed to fit specific tasks. They alleviate the need for artisans to work in awkward postures, stand for long periods, and to manually adjust heavy/awkward items. Several examples of how Lazy Susans are being used at FRC East Shop 96559 follow.

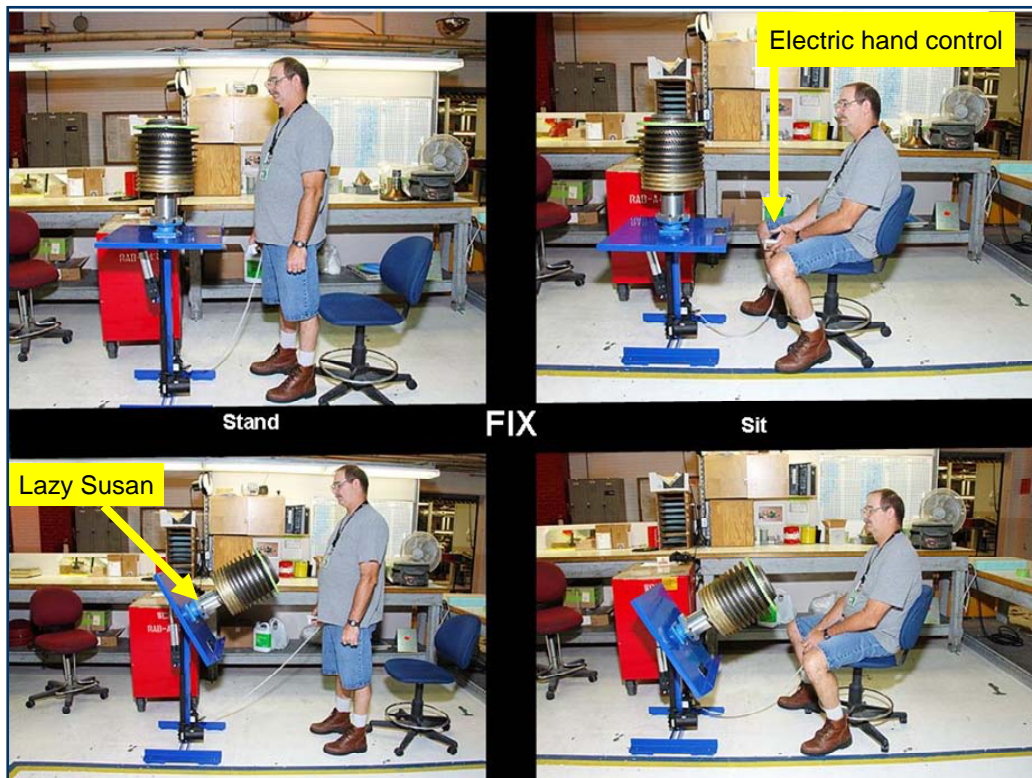
In Shop 96559, T64 engine compressors for H-53 helicopters are assembled and balanced. Artisans working on the compressors used to stand bent over their work for long periods, which put them at risk for WMSDs of the neck, shoulders, elbows, wrists, and lower back (see yellow "X"s in photos below). Standing for long periods also led to pain from pooling of blood in the feet.



Artisans stood for long periods bent over T64 compressors, putting them at risk for WMSDs.

The Lazy Susan designed for Shop 96559 artisans working on T 64 compressors can be height adjusted using an electric hand control. By adjusting the height of the Lazy Susan, artisans can alternate between sitting and standing postures. Alternating sitting and standing allows the muscles stretched during one posture or task to have a chance to recover. Alternating also minimizes the strain on any single body part and improves blood flow from the legs by preventing pooling of blood in the feet and resultant swelling.

Artisans can also use the Lazy Susan's electric hand control to tilt engine parts they are working on at a 45 degree angle. This eliminates the need to bend over the parts for long periods.



Shop 96559 artisans use a height adjustable Lazy Susan to allow them to alternate sitting and standing postures and to tilt parts to avoid bending over their work for long periods.

Mass Moment Stations located in Shop 96559 are used to balance F408 LPC1 engine blades. Artisans used to lay out two rows of blades at the Mass Moment Stations. This task required long periods of standing and awkward reaches, which put stress on wrists, shoulders, neck, elbows, abdomen, and lower back (as indicated with a yellow "X" in the photo below). Handling the parts in this way brought with it the added risk of damage to the parts if they hit one another.



Work at Mass Moment Stations used to involve standing for long periods and awkward reaches.

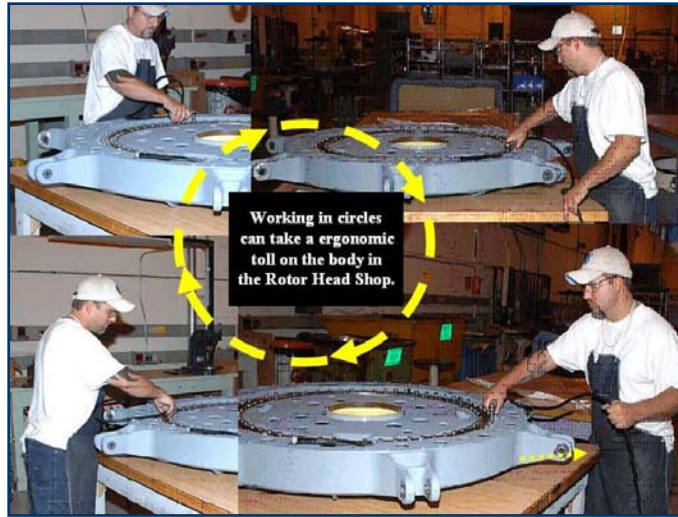
The height adjustable Lazy Susan designed for the F408 LPC1 Mass Moment Stations allows artisans to alternate between sitting and standing in a neutral posture. Rotating the Lazy Susan moves the parts directly in front of the artisan, which eliminates the need for awkward reaches and protects the parts from being damaged.



At Mass Moment Stations, the Lazy Susan can be adjusted to allow artisans to alternate sitting and standing postures and rotates to eliminate the need for awkward reaches.

Artisans in the FRC East Rotor Head Shop take apart and rebuild the H53 E-model Swash Plate, an engine part for the H-53 helicopter. Workers used to walk in a circle and stretch to reach repair parts. This procedure was not only tiring, but the artisans were at risk for WMSDs from bending over repair parts and using awkward reaches (as shown in the photo below right).

The solution was a Lazy Susan (pictured below left) that rotates with the ease of the artisans' finger tips, bringing the repair parts directly in front of the worker. In addition, the height of the Lazy Susan can be automatically adjusted by pressing an up/down button to bring the work load to the worker at his/her neutral posture level.



Lazy Susan can be automatically adjusted by pressing an up/down button to bring the work load to the worker. An ergonomic chair allows artisan to sit in a neutral work posture.

and back pain. They experience far less fatigue while doing their jobs and consequently are much more productive.

Now artisans can alternate sitting and standing postures while working on parts at the Lazy Susan. New ergonomic chairs that adjust to allow each artisan to sit in a neutral working posture were also purchased.

Artisans making use of Lazy Susans at FRC East now find that they have fewer or no complaints about neck, back, wrist, elbow, shoulder, foot

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