



Ergonomics Case Study TMX Aerospace Raised Workstations

Background

TMX Aerospace, a division of ThyssenKrupp Aerospace, requested help from an L&I Ergonomist to train their safety committee on preventing back injuries. In order to customize the training, the ergonomist toured the Auburn facility and took photos of material handling tasks ahead of time.

Issues Found

Completed materials were delivered via forklift to the floor of the packaging department for quality checks, packaging and banding. Pallets of materials were placed randomly, wherever there was free space. Sometimes they were so close together, workers had to twist or lean to fit between them. Workers spent a substantial amount of time stuck in bent, squatting or kneeling postures as they measured for quality checks. Banding put workers in more awkward postures as they reached over and across the pallets. Workers risked developing musculoskeletal disorders such as low back pain or disc injuries and bursitis of the knees or hips.



Prolonged kneeling while completing quality checks.



Repeated bending while packaging.

Recommendations

The L&I ergonomist proposed solutions that would elevate the work to a comfortable height for standing. These included:

- Stack up several pallets with the fork lift
- Provide work tables at different heights
- Use scissor lifts

Implementation

TMX Aerospace performed a kaizen event in the packaging department to further identify risk factors and solutions. (A kaizen event is a continuous improvement process of Lean Manufacturing. It focuses on a specific work area, training people to spot and eliminate waste in business practices.) The team used an evaluation tool to isolate different body parts and quantify the exposure to risk factors. In addition to awkward postures, the kaizen team observed contact stress as workers leaned against the sharp steel edges of the material while measuring. Contact stress can cause bruising and reduced circulation to skin, muscles and tendons.

To determine the right height for standing workstations, pallets were stacked to various heights and tested. Workers identified three optimal heights which allowed them to do the job with a minimum of bending.



The in-house maintenance department fabricated three pairs of various sized sawhorses. The sawhorses created standing workstations that significantly reduced awkward postures and contact stress.



Follow up

Initially, workers thought it took too long to stage the packaging area. It seemed quicker to just stash the pallets of material anywhere on the floor and work the jobs in random order, depending upon the location of the tools. Time studies revealed that it only took a few seconds longer to do it the new way. And now the jobs are worked in the correct order, contributing to the Lean Manufacturing “just in time” principle.

TMX Aerospace reported benefits of the changes, which include:

- Happy packers
- Improved productivity
- Improved quality of life
- Improved quality of product
- Reduced probability of an overexertion injury

The kaizen team identified several “lessons learned”:

- Floor packing is BAD
- A wrong sized work table creates congestion
- Better ergonomics improves the flow of material
- How to use quantitative methods to assess ergonomics
- To step outside the box in addressing issues
- To develop “Ergo Eyes” to see potential hazards and solutions
- Upstream processes have a high impact on the ergonomics and methods in the packaging department
- To recognize the need for improvement in other departments

For continuous improvement, TMX Aerospace plans to add spring-loaded casters to the sawhorses to make them easy to move from place to place on the shipping floor.