

A cut above

Focus on ergonomics creates an elegant solution that solves multiple issues

By JEFF WOOD

Jeff Bacon, Cutting Tool Service Center tool grinder, had an idea for a quick-release mechanism that would make it easier and quicker to load heavy cutting tools into a fixture for maintenance.

Dave Scholze, Auburn (Wash.) Tooling Services (ATS) machinist, noticed that the nylon sling of the overhead chain hoist used for lifting the cutting tools required frequent inspection for wear where it contacted the tools' sharp edges.

Mark Stuart, Materials and Process Technology (M&PT) Associate Technical Fellow, saw that mechanics were forced to work in awkward positions—and sometimes to bear the full weight of the bulky tools by hand—because the chain hoist did not reach to cover their full work area.

These three employees, working in a variety of job classifications and in different areas of the Boeing Fabrication facility in Auburn, might have gone their separate ways to resolve their issues. But thanks to the M&PT and Environment, Health & Safety Ergonomics groups, they had a forum where they could raise issues, trade ideas and put their heads together to develop solutions.

GETTING INVOLVED

Every Monday morning, the ATS ergonomics team gathers for an hour in a conference room. The goal of this cross-functional group, which includes mechanics, engineers, and managers, is to make their jobs safer and develop ways to perform their tasks as efficiently and effectively as possible.

Bacon took advantage of connections made during ergonomics meetings to talk to Scholze about his ideas for a quick-release mechanism. Scholze got involved with the ergonomics team upon returning to work after an injury.

Jeff Bacon (from left), Dave Scholze and Guy Bandieramonte try out the clamp and quick-release device they developed to grasp cutting tools. The arm of the air balancer (yellow) can rotate to reach any point in the work area. Operators turn a dial on the red block to select the amount of weight the balancer will counteract.

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“Working with the ergonomics team gave us leverage to get the time and resources we needed to work on the issues,” Scholze said. “Anyone can participate.”

Scholze and ATS tool programmer Guy Bandieramonte began working on prototypes and eventually codeveloped an innovative clamp to replace the nylon sling of the chain hoist that was used for lifting cutting tools to the grinding fixture. “We began tossing ideas back and forth at lunch time, and before long we were trying out solutions,” Bacon said.

Scholze and Bandieramonte integrated a quick-release mechanism with that clamp, which grips cutting tools without coming in contact with sharp edges. They were recently granted a meritorious invention award after submitting the invention to Intellectual Property Management.

The final element of the solution came into place when Stuart discussed the incomplete floor coverage of the chain hoist with ergonomist Brian Poggioli, who was working with a group in another Auburn building. Poggioli knew the group was preparing to “surplus” a lifting aid called an air balancer.

“The balancer uses air pressure to counteract the weight of the tool,” Poggioli said. “You dial in how much weight you want to counteract, and the balancer allows you to move a 75-pound (34-kilogram) cutting tool as if it weighed only 2 or 3 pounds (1 or 2 kilograms).”

Stuart was immediately interested, because the balancer’s 10-foot (3-meter) arm covers the entire work area, from the cutting tool drop-off area to the maintenance tool fixtures. He said ergonomic risk assessment revealed three major risk factors in the old process that depended on the chain hoist. Operators repeatedly lifted heavy tools, held the tools with arms extended away from the body to avoid the sharp edges, and adopted awkward postures when attaching and detaching the nylon web. The 10-foot reach of the air balancer would address all three issues.

Focusing on the ergonomic risk factors helped the team bring together three good ideas—the quick-release, the clamp, and the air balancer—to create an elegant solution to several long-standing issues.

RID OF THE CHAIN HOIST

Bacon is happy to be rid of the chain hoist. “Using the balancer, I can move a cutter to the grinder in no more time than it takes to lift it

by hand,” he said. The quick-release reduces the amount of handling required to position the tool for maintenance. “And I don’t have to worry about chains swinging back through the work area after the tool is released from the sling,” he added.

The Auburn ergonomics process encourages employees to take charge of improvements in their own areas by providing a structured way for employees to develop their ideas that make their work experience better. Auburn M&PT ergonomists Stuart, Todd Lefkowitz and Poggioli work with groups throughout the Auburn site.

“We can often put team members in touch with other teams that have had experience with related issues,” Stuart said.

The Auburn ergonomics process, led by Kim Holtman of EHS, measures results using standard metrics and documents improvements so that best practices can be shared with other areas.

Stuart said beyond reducing the risk of injury, improvements such as this benefit the whole company.

“By reducing the amount of lifting and physical strength required to do the job, we open opportunities to perform this function to a wider number of Boeing employees,” Stuart said. This creates a larger pool of potential employees who can qualify for the function and increases the variety of functional areas where individual employees can choose to work. ■

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