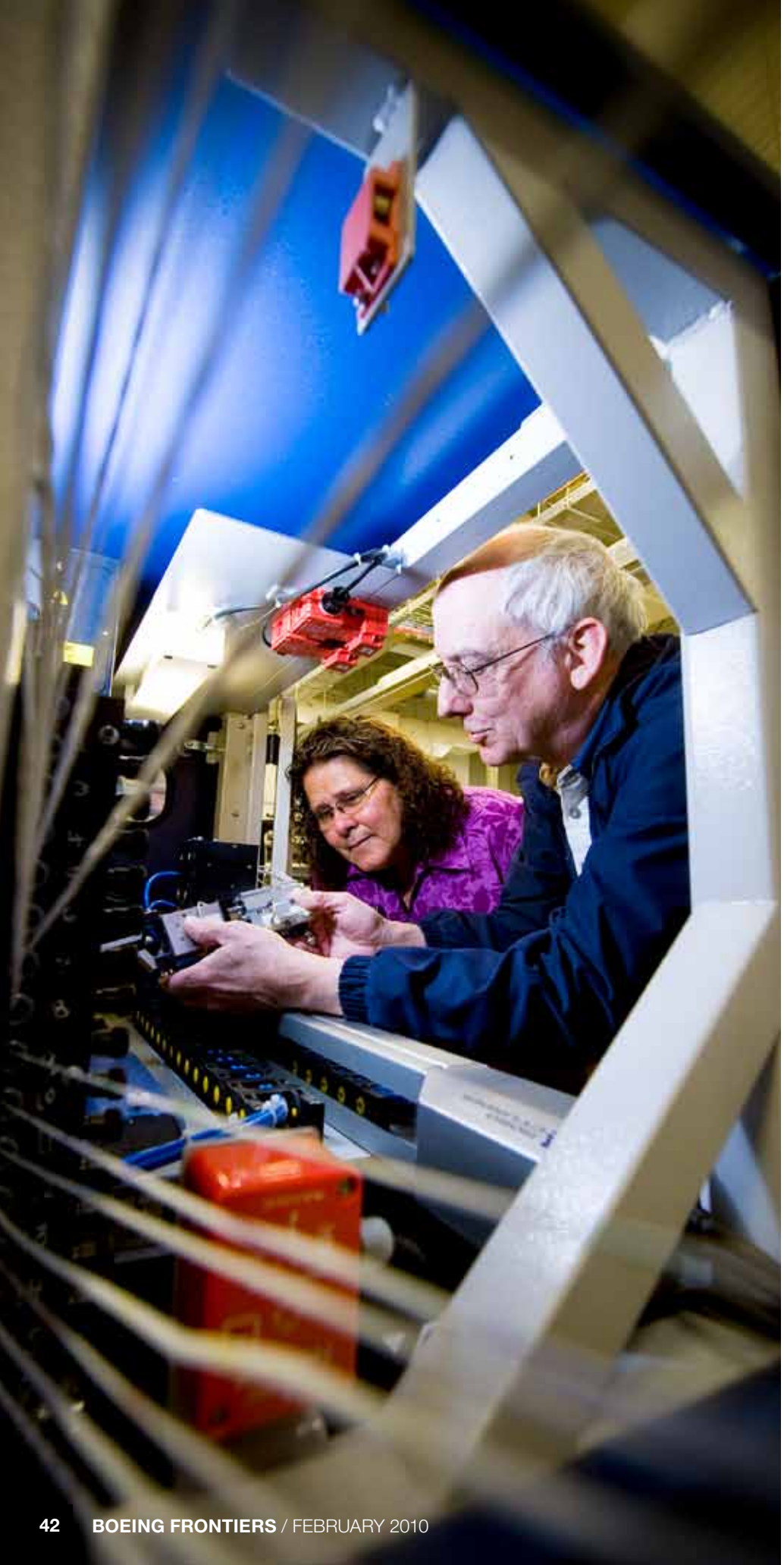


Cool run

A Lean+ tool known as Total Productive Maintenance helps keep machinery downtime to a minimum

by Bill Seil and photos by Bob Ferguson

Auto racing fans understand the importance of drivers and pit crews working together to get a car back on the track. The quicker they identify problems and make repairs, the sooner they'll be crossing the finish line.

The same teamwork can be applied on Boeing assembly lines, where production and maintenance personnel have a shared interest in keeping machinery in operation and avoiding unexpected breakdowns. Total Productive Maintenance is helping them do just that.

As one of the tools in Boeing's Lean+ toolbox, Total Productive Maintenance encourages collaboration between production workers and the people who maintain their equipment. Through teaming and organized workshops, all participants find ways to share information and perform tasks together. In some cases, basic maintenance tasks are assigned directly to the equipment operator.

Gerry Patterson, director of Site Services for San Antonio, until recently was responsible for the Total Productive Maintenance program in Wichita, Kan. He said the program combines the expertise of maintenance and operations people to predict where machine faults could

nings

result in downtime. Once identified, the faults are corrected through maintenance or replacement of worn parts. The goal is 100 percent productivity.

"The whole idea behind [Total Productive Maintenance] is to make sure your equipment is available at all times," he said. "Ideally, your equipment should only be shut down for scheduled maintenance."

Boeing's customers rely on these teams to maintain, modify and upgrade their aircraft on time and on budget. Missed schedules mean critical assets are sitting in a hangar in Wichita instead of in service supporting the warfighter.

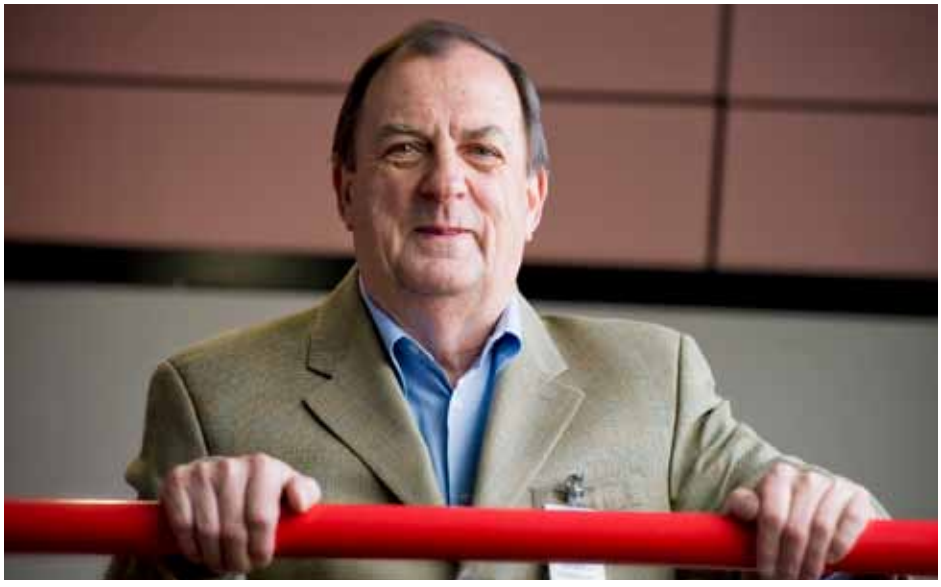
Total Productive Maintenance has been particularly successful at the Wichita site, which scored a perfect 5.0 during its past two Lean Manufacturing Assessments, and 4.5 the two prior years. Patterson credits two Wichita Site Services Lean+ experts—Ken Peoples and Don Henry.

"To get a 5.0 in anything is almost impossible, and Don and Ken have achieved that for the past two assessments," Patterson said. "They've done a great job."

Patterson noted that some have referred to Total Productive Maintenance as "total predictive maintenance," since anticipating problems is such an important element of the process. But ultimately, the program is a range of steps taken to maximize productivity. It's based, in part, on the belief that an individual who operates equipment day after day has hands-on experience that is invaluable in diagnosing maintenance issues. In fact, Total Productive Maintenance is more than a maintenance concept; it's a culture change that engages everyone in continuous improvement.

Due to Wichita's exceptional performance, Boeing Defense, Space & Security Lean manufacturing leaders asked the team to share their best practices at BDS locations around the enterprise.

Peoples noted that although the concept of Total Productive Maintenance may sound simple, it's based on a detailed approach developed by a unit of Toyota.



"The whole idea behind [Total Productive Maintenance] is to make sure your equipment is available at all times."

– Gerry Patterson, director of Site Services for San Antonio

PHOTOS: (Left) Mark Walton, a Site Services equipment maintenance technician, works with equipment operator Rosemary Seip to keep the Mesa, Ariz., site's laser marking machines working properly as part of the Total Productive Maintenance program. **(Above)** Gerry Patterson, director of Site Services for San Antonio, until recently was responsible for the highly effective Total Productive Maintenance program in Wichita, Kan.

It requires advance preparation and a strategy that works in concert with the organization's Lean plan.

The predictive maintenance practiced in the program should not be confused with preventive maintenance, according to Peoples. Predictive maintenance bases maintenance needs on the actual condition of equipment, rather than on following a predetermined maintenance schedule.

Vince Tappel, director of Lean programs for the BDS Operations and Supplier Management organization, said the experience of production workers can play an important role in maintaining equipment.

"When people know their machine well, they might have a sense that something's not quite right," Tappel said. "They may notice that it's a little harder to push a handle, or that the machine isn't working the way it used to."

In Mesa, Ariz., Barney Jeffrey, Shared Services Site Services Buildings and Grounds manager, said Total Productive Maintenance is being used to maintain several types of equipment on the Apache helicopter and other BDS military aircraft programs, ranging from wire-braiding machines to transmission test stands.

It's been particularly valuable in keeping the site's laser marking machines in good working order. The equipment measures wire from a spool and marks it. This gives specific information to those building the wire harnesses. Total Productive Maintenance teams also have begun instructing equipment operators in basic procedures required to maintain the laser markers. Production and maintenance personnel now participate in weekly meetings to discuss work assignments and schedules and work together to keep equipment running.

For operations people, equipment downtime is reduced and they learn to handle problems as they arise. Maintenance technicians find they have fewer interruptions, giving them more time for other maintenance duties.

"The neatest thing is the way people are working together," Jeffrey said. "Operators used to say, "I run it and you fix it.' Maintenance people would say, 'I fix it and you run it.' Now we've joined the two groups and everybody is participating in maintaining the equipment." ■

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PHOTO: In Mesa, Ariz., Site Services leader Rick McKenney (right) consults with FlashJet operator Mike Acosta of Boeing Defense, Space & Security to resolve problems Acosta encountered with a gearbox on the Flash tool, a high-intensity flash lamp used to strip paint from aircraft.