

# Effective Maintenance In Cellular Manufacturing

The 1,200-employee West Bend Company (West Bend, Wis.) manufactures stainless steel cookware and small household appliances. By the mid-1980s, management was realizing that competition was “heating up” in the marketplace and that the company would need to rethink its manufacturing operations. Some of the initiatives that resulted included focused factories (cellular manufacturing), cycle time reduction and JIT, kaizen projects, and other steps to reduce waste.

The focused factories in particular (introduced in 1986) were designed to provide the company with additional agility and improved marketplace responsiveness. Management created five such divisions: Beverage Makers, Brazed Electrics, Assembly and Molded Products, Fabricated Metals, and Premiere Cookware — and the results were impressive: Work in process shrank from days to hours. The company is now able to ship hundreds of truckloads of products within a few short hours.

These changes, however, were not without challenge for Maintenance, and the improvements could not have come about without the active involvement of Maintenance. In specific, Maintenance had to make two significant shifts in how it did its work:

- ➔ a shift from centralized to focused factory maintenance, and
- ➔ a shift from traditional maintenance to total productive maintenance (TPM).

## Focused Factory Maintenance

“We have over 800 pieces of equipment in our focused factories,” explains Karen Wilson, general manager. “This is no longer a situation where we can afford to have pieces of equipment down and just switch production from one machine to another.

In a focused factory setting, all of the equipment needs to be running constantly. Maintenance needs to keep downtime to a minimum because production is in line.”

To address this challenge, the company shifted from a centralized maintenance department that was responsible for the whole plant to a focused factory maintenance structure, where individual maintenance teams are responsible for individual focused factories.

“Each maintenance team now concentrates on a certain number of machines in its focused factory,” she explains.

A benefit of this approach is that the team is now much more knowledgeable about how each piece of equipment in the cell is operating and how to troubleshoot that equipment.

## Total Productive Maintenance

West Bend introduced the concept of TPM in the early 1990s. The idea was to supplement the shift to focused factories. The shift itself was logical, given that operators had taken over more ownership of and responsibility for the production process, and a hallmark of TPM involves a degree of operator responsibility for the maintenance of their equipment.

“Prior to TPM, Maintenance fixed and refixed equipment, without spending much time investigating the root causes of problems,” explains Wilson. “They often continually replaced parts without finding out why the parts were failing.”

Under TPM, maintenance staff and operators work together to identify problems that reoccur, to determine why these problems continue to occur, and then to implement solutions. And some of those solutions

may go so far as to involve redesign projects. For example: If employees note that a conveyor is “eating itself up” because of the way it has been designed, the team will take it upon themselves to consider redesigning the conveyor.

Operators also take responsibility for some of the basic PM tasks, such as regular equipment inspection.

“They also listen carefully to how their equipment sounds and report any changes,” adds Wilson.

How did the operators respond to the new responsibilities associated with TPM? At first, there were some challenges,

admits Wilson. “They were very busy running the equipment and being involved in some of our kaizen projects,” she states. (Kaizen projects involve three to five days of team investigations into cost, quality, and/or service improvement opportunities.) Over time, however, the operators have become comfortable with their new PM responsibilities.

Both the maintenance staff and the operators enjoy the benefits of TPM. “It gives us more information, and it is also more predictable,” she reports. “For example, we now replace certain chains every three months, because we now know that this is when they will wear out.”

## Scheduling

Each production cell has a schedule of when equipment needs to be maintained. “It’s the responsibility of each focused factory team to handle its own maintenance,” she states.

Some of the factories use computer scheduling. The system identifies each PM project and gives it

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a specific date for completion. The system also triggers notices three weeks prior to each scheduled PM project.

This provides two important benefits:

- It alerts the team to provide the toolcrib with a list of parts that need to be ordered, so parts will be on hand when the PM is scheduled. “When the team pulls the PM folder for a piece of equipment, the folder contains a list of all the parts that need to be available,” she explains. “They simply hand this list to the

toolcrib to make sure we will have what we need.”

- It also provides an estimated time breakdown so the maintenance team can schedule the work appropriately. Example: One PM project might have an estimated time of three hours for electrical craftsmen and five hours for mechanical craftsmen.

Other factories utilize a manual scheduling system. “They installed a large white board that lists all of the equipment and when it is scheduled

for PM,” continues Wilson. “It is very visual.”

## Results

The changes in Production and Maintenance mean the company now has a better tracking mechanism for identifying, predicting, and preventing equipment maintenance problems. “As a result, we’ve seen unplanned downtime decrease by 40 percent,” says Wilson. “This has obviously improved our ability to respond to customer needs in a timely fashion.” ■

# Compliance Countdown: Forklift Operator Training

**D**oes your facility have powered industrial trucks (forklifts) traveling its aisles? If so, are the operators competent to handle the task? They’d better be. Unfortunately, many forklift operators lack adequate training to operate their trucks safely. Each year about 100 workers are killed and almost 95,000 are injured in forklift accidents. As many as 40,000 of those injuries can be characterized as “serious.”

A breakdown of the fatal accidents for one recent year shows the following causes:

- ✓ Forklift overturned
- ✓ Struck by material
- ✓ Struck by lift
- ✓ Worker pinned
- ✓ Lift ran off dock
- ✓ Died during repair

And as one expert commented, most if not all of those accidents could have been avoided with adequate training.

Until recently, however, many employers had a difficult time determining what constitutes adequate training. OSHA’s standard stated that only “trained and authorized operators shall be permitted to operate a powered industrial truck.” Each employer was allowed to determine what passed for adequate training at its facility. The problem with that

approach was that some interpreted that “trained and authorized” language very loosely, providing training that amounted to little more than a quick overview and a pat on the back.

## An Overview

OSHA’s new standard offers employers considerably more guidance as to training content and methodology. Your training program should include the following:

- ✓ **Formal instruction** — such as lectures, discussion, interactive computer training, video, and written material
- ✓ **Hands-on training** — including demonstrations performed by the instructor and practical exercises performed by the trainees
- ✓ **Evaluation of performance in the workplace** — conducted at least every three years

Overall, the content must take the following factors into consideration:

- **the operator’s prior knowledge and skill**
- **the type(s) of powered industrial truck the operator will be using**
- **the hazards present**
- **the operator’s demonstrated ability to operate a powered industrial truck safely**

## Effective Dates

OSHA’s standard became effective on March 1, 1999, but employers have until December 1, 1999, to complete the evaluation and training of operators who were hired before that date. For all operators hired after December 1, 1999, employers must complete their training and evaluation before the operator can be assigned to operate a forklift.

Operators who have already received training can be grandfathered as long as their employer evaluates them and certifies their competence to perform their assigned duties.

An added wrinkle is OSHA’s requirement that refresher training in relevant topics be provided whenever

- *the operator has been observed to operate the vehicle in an unsafe manner*
- *the operator has been involved in an accident or a near miss*
- *the operator has received an evaluation indicating one or more performance deficiencies*
- *the operator has been assigned to a different type of truck*
- *conditions of the workplace change in a manner that could affect safe operations*

The fact that you or your people don’t regularly operate these vehicles doesn’t excuse you from these requirements. The compliance clock is running. ■

