

The Many Faces of Manufacturing Efficiency

Rob Spiegel, Senior Editor, *Automation & Motion Control*, November 29, 2013

North American plants are becoming more efficient. While the term lean manufacturing once had a very specific meaning at plants like Toyota with its quality circles, now the term has come to mean any technique that brings efficiency and optimization to the manufacturing process. This goal is to improve throughput while reducing waste, to improve uptime while

reducing energy consumption, to improve safety while reducing work stoppages.

Gains in manufacturing efficiency and automation means that logistics play a larger role in choosing a location for a plant. If your manufacturing is efficient in Ohio, you will be less likely to locate your plant in China. What you save in cheap overseas labor will be eaten up by shipping. The idea of keeping your manufactur-

ing close to home works only if you can make sure your processes are very lean. We're seeing new progress on a wide range of plant processes.

Less hardware and more software

One of the trends we're seeing in lean processes is an increase of reliance on software and the trimming down of hardware. "How can you do more with less? If you have more functions with one controller instead of many

controllers, you'll be more efficient," Graham Harris, president of Beckhoff Automation, told Design News. "You can control a machine with three axes with one controller. The synchronization is easier with one controller because all the data is on one CPU. That also saves cabinet space."

The savings in hardware can include everything from PCs and controllers to wires. "You have less hardware and more software now. That's efficient," Harris told us. "You have only one cable, while traditionally, it was dual cables. So you have less material. Safety is now integrated into the same Ethernet bus as the controller. That offers savings in set-up."

Safety and simulation

Safety has become significantly more efficient. For one, you can run safety on the same wire as control and power. For another, safety breaches don't have to bring down the whole plant. "We have safety in zones now. We have the ability to just stop the zone when there is a safety infraction," Patrick McDermott, regional manager at B&R Industrial Automation, told Design News. "We don't have to stop everything. We're going to programmable safety."

Simulation has also brought efficiency to plant processes. Changes can now be worked out in simulation before you turn on machines

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that might crash into each other if you don't work out the configuration ahead of time in software. "Technology also means I'm not rewiring when I make a change. I'm changing the code instead. It's configuration, not design and rewiring," said McDermott.

The simulation means changes can

be made both accurately and quickly. “One factor is time-to-market. Simulation allows machine builders to minimizing time on the machine,” McDermott told us. “You can spend your programming time up front. That minimizes time on the machine.”

Employee buy-in

Another way to make sure efficiency really takes hold in a plant is to get employee buy-in. You get the buy-in by involving employees in the efficiency process. “It starts with getting people to understand there is always room for improvement. You have to embrace

all employees,” Jim Coshnitzke, a manager at [Clippard](#), told Design News. “You get people in production, supervision, and management, and you map the current cycle. You model it and get input from everyone.”

“That input from everyone can be as little as changing the work set-up to make production movements more efficient. It may not seem like much when you save a handful of seconds, but they can add up to real savings. You look at what steps you can change. You rearrange tools to make movements easier. You save 15 minutes. You add it up and it saves hours,” said Coshnitzke.

“You work on those ideas. But in order to get the employees’ ideas, you have to have employee buy-in.”

The employee input can be as little as saving movement or as large as changing the fundamental manufacturing process. “In one instance, we compared batch to process. We had been doing batch. So we took all of the employees and took them through a Lego exercise,” said Coshnitzke. “We did batch, and then we did flow. We saw a 300-percent improvement with flow. Everyone was involved, so we have the buy-in to switch from bath to flow.” ■