

Lean Manufacturing Goes Molecular

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Lean manufacturing and continuous improvement is now being applied to all sorts of factory processes. Kaizen or continuous improvement is a never-ending process—there is no finish line. It is natural, then, when applying the principles of continuous process improvement to initially focus on people, equipment and tools since we can use our basic senses to see what is going on. However, in the spirit of truly striving for perfection, kaizen can be taken to the molecular level.

Technology aids in looking at things we can't see, feel or touch. Using specialized monitoring equipment that illuminates areas of the factory, which typically do not get enough attention, many processes, including sub-metering around thermal oxidizer energy usage and general manufacturing plant processes, can benefit from this analysis (e.g. wash and paint lines, compressed air, substation peak demand, coolants and chemicals).

One example is in the chemical processes a manufacturing company may use. For example, in a tube mill, data can be gathered on tons of input, production, scrap, tooling costs, mill utilization, coolant and water used, man hours and energy consumption. Cost savings can be realized in any of these areas, but energy and water consumption and wastewater have been the hot-button issues as of late.

Many factories get one large bill for gas and/or electricity, and they don't really track energy use by process. For example, one midwestern manufacturing complex that has seven five-stage tunnel washers fired up boilers to bring chemical baths up to temperature without paying great attention to what was going on daily. When analyzed, the data indicated that bath temperatures ran on the high end of the control limits.

Also, the data showed that when operators arrived in the morning, they immediately fired up boilers and heated baths to temperature 30 minutes on

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average earlier than required for production. Similarly, at the end of the workday, boilers were not turned off until the end of the day when they could have been turned off approximately 30 minutes prior. As a result, policies for startup and shutdown were set for all boilers, saving more than one hour of run time a day per boiler. Annual energy savings exceeded \$200,000.

A process audit can be done over a 60-day period to pinpoint where the problem is prior to making recommendations on how to correct the processes. Following are the six steps that Profit Finders have found to be successful when conducting an audit:

Step 1: Senior Management Approval

The first meeting is with a company president, vice president of operations or lean manufacturing champion. The typical goal is to identify a factory in the company's system that may qualify for an audit.

Step 2: Discovery Day at the Factory

A technical team visits the candidate factory to determine if a process audit is appropriate. The objective is to ensure that there is a high probability of success. During discovery day, the technical team plans work that must be done to begin a process audit. This involves discussions with plant management and the maintenance department.

Step 3: The Process Audit

Working through the maintenance department, controllers, sensors and probes are installed. A phone line or Ethernet connection is required so data can be monitored via the Internet. Installation is complete in a day. Moreover, the process audit does not interfere with normal operations.

Step 4: Continuous Improvement Proposals

Using data gathered during the process audit, several proposals for continuous improvement are suggested. These are reviewed with plant and senior management.

Step 5: Implement & Document

The auditor is at the factory 24/7 via technology—gathering hard data—but the client's workers must implement process changes. Typically, auditors meet with the client every 90 days to check on progress and review data.

Step 6: Do It Again

Continuous improvement is a never-ending process. After a predetermined amount of time, the relationship usually continues on a month-to-month subscription, and a continuous stream of process improvement projects are approved and

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implemented.

In conducting audits over the past year, Profit Finders has discovered that a few simple techniques go a long way towards a successful outcome: Get your Internet connection in place early. Sometimes providing a simple phone line or Ethernet connection so process audit data is readily accessed via the Internet takes longer than anticipated. (Often your information technology department wants to get involved for security reasons.) Get this done early, so the start of a process audit is not delayed.

Have your maintenance department spend time with the audit team during discovery day. Maintenance personnel need to install the controllers and probes that gather valuable data, and should be involved at the front end. Assign a task force with a leader to meet at the plant with auditors every 90 days.

An outside auditor can gather data and document improvements, but the task force is at the plant every day. They have to make process changes happen on the shop floor. Keep senior management involved. Have the task force present results to senior management every 90 days. It is best to have the task force take ownership and credit for the improvements realized as well.

For more information, please visit www.profitfinders.net [1].

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