

Even though the Industrial Engineer staff had individual operators working at peak efficiency, machine down time and poor synchronization between departments was killing them.

Overview

During any surgical procedure, maintaining a sterile surgical field is imperative. One of the ways this is accomplished is that the surgeons, nurses, technicians, and patients are covered in sterile garments. Our client produced the sterile gowns worn by the surgical staff, as well as the drapes placed over the patients. Made of a paper like disposable material, these garments required cutting, sewing, gluing, folding, assembling (into surgical packs or kits for different types of procedures), sealing into vacuumed pouches, and irradiating to ensure sterility.

Because of this, management was motivated to take action when the alternative was closing the facility. Employees were paid by the piece, and in order to improve financial performance, management raised the daily quota, which created increased pressure. This pressure did produce higher volumes, but it also lowered quality as employees' sole focus was on meeting the numbers. It also increased machine down time because little care was given to preventative maintenance issues. This pressure also pushed employee turnover to greater than 10%, which then consumed additional resources just trying to hire and train all those new people.

Data Collection

A team was formed consisting of an OpEx Implementation Specialist, Industrial Engineers, operators, supervisors, and machine maintenance personnel. They began by videotaping and analyzing the processes and activities using the Catena[®] Improvement System. The analysis determined the product took 16 days from order until it was shipped; 97% of that time, the product waited to be acted upon. The activity analysis showed that the operators spent greater than 80% of their time adding value, if taken in isolation this is a world class number.

Unfortunately the overall equipment effectiveness, or the time machines were available when you needed them, was 62%. In other words, when working, the operators were very efficient, but 40% of their time was lost due to machine failure. Although management knew reliability was a problem, they didn't understand its full significance because most failures were fixed temporarily by machine operators and maintenance was not called. If maintenance isn't called, then there is no record of the problem. Also, because of a lack of synchronization between departments, it required large numbers of people moving inventory and sorting through stacks of work in process.

Transformation

The first step was to convince the plant manager to freeze hiring. At 10% attrition per month, we would not need to layoff employees while reaching the productivity numbers required to save the factory from closure. By applying the technique of Total Productive Maintenance and SMED, we were able to drive machine availability from 62% to 96%.

Next, we linked as many value added steps as possible within the flow using the principle of One Piece Flow to reduce the lead time from 16 days to 5 days. This freed up 9,000 square feet and saved them \$1M in inventory. This also reduced the need for material handlers and expeditors, thus further increasing overall productivity.

Changes were made to improve ergonomics and work teams were developed. One work cell would be comprised of eight pods, each pod with a team of six people. Instead of paying by the piece for each individual, teams were paid for adherence to Standard Work. The Standard Work includes machine up-time, productivity based on total input divided by total output, and defect free production.

As a result, productivity soared by freeing up almost 600 people. Not only was the factory spared closure, but the employees received a pay increase of 10% *plus* performance bonuses, which helped reduce the company's costly attrition rate.



*“Improving organizations
one process at a time”*

