

Empowered To Perform

Providing employees with the right tools - literally and from a 5-S/Kaizan perspective - have produced a number of workflow benefits at this Ingersoll-Rand plant.

By Jeff Reinke, Editorial Director



Pictured above are Jeff Cain, Susan Pearson, Donna Brinkley, Selah Scott and Michael Brown, employees with an average of 14 years experience at the Southern Pines location. These workers, and others like them, have been the key reasons for recent workflow improvements throughout the facility.

As a former infantry officer in the U.S. Army, Bryan Lugeenbeel knows all about being a leader. And fortunately for Ingersoll-Rand and the Southern Pines, NC facility he oversees, Lugeenbeel never forget the most important element of leadership - the led. In speaking about the successes and efficiencies that have been achieved at this location about an hour south of Raleigh, the former 82nd Airborne officer is quick to note that none of these things would be in place if it wasn't for the way employees and other plant leadership have bought into a culture focused on continuous improvement.

Since 1979 this Ingersoll-Rand Industrial Technologies plant has been involved in the manufacturing, assembling and packaging of balancers, power cylinders, tools and hoists in supporting five different business units of its parent company. When Lugeenbeel grabbed the helm in January of this year he quickly came to a couple of significant realizations:

- He had a very experienced workforce of 205 people that had been associated with the production of these products for 20 - 30 years.
- Due to a string of retirements, his management team was relatively new to Ingersoll-Rand.
- There were a number of workflow issues that needed to be resolved soon.

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"We basically have a management team that's been in place since January," states Lugeenbeel, "but we all have a background in implementing lean manufacturing principles. The biggest thing working in our favor, however, was and is our people. The facility has tripled production since it opened without adding to the head count. This shows that people are vested in what they do, they're proud of the job they do, and they're always interested in ways to do it better.

Before the arrival of Lugeenbeel and his team, the facility held an average of four Kaizan events each year in focusing on a particular area of the manufacturing process. These events stemmed from Ingersoll-Rand's "Pathway To Excellence" initiative that has been instituted throughout the company's U.S. manufacturing locations. So while the foundation had been laid, the time had come to take things to the next level. With 157 Kaizan events having been held so far this year, that might be an understatement. Holding this many events could be counter-productive, but the staff's experience and dedication allows workflow to proceed smoothly, and without slow-downs. "Although production in the specified area on which the Kaizan event focuses is shut down, we're able to plan and manage workflow to ensure these events don't create a bottleneck or production issue," states Carol Sanders, the plant's lean production manager.



Benefits of the series of Kaizan events that have been held so far this year at the Southern Pines facility include the allocation of nearly 15,000 square feet of operating space, and a starting point for improved inventory organization relating to quicker work cell fulfillment.

"Additionally, holding these events more frequently allows the teams to move through the process more fluidly. Plus, we have different levels of events. Not every situation warrants a 3-5 day evaluation. Some things can be resolved in a matter of hours."

On The Level

The approach is as simple as, well, ABC:

- An "A" event is led by a Six Sigma black or green belt. These events are very thorough and usually last 3 - 5 days.
- A "B" event is led by a project manager and lasts around 3 days.
- Finally, a "C" event is something this is just done on the shop floor and can

be accomplished in a couple of hours.

The focus thus far has been on improving work cell organization. This primarily means making them safer, cleaner and more ergonomic. Ironically enough, one of the biggest initial changes has been implementing the use of more power tools, automatic fluid dispensing equipment, workholding fixtures and other products that reduce or eliminate manual processes. The benefits have not only been realized in time-savings, but also in creating a better overall working environment.

Feeling the Effects

Here are some of the results Ingersoll Rand Industrial Solutions' Southern Pines facility has produced with their frequent Kaizan events and overall approach:

Rail kit assembly cell results:

- Reduced cycle times by 60 percent, works in progress by 80 percent and overall cell footprint by 68 percent.
- A kit was developed for air supply tools.
- Before, parts were being tightened using an impact tool without torque control. Now, the impact tool has been replaced with an electric DC torque control unit for precision-controlled fastening.
- Before, parts were held by hand for tightening. Now, tooling has been created.
- Also, a balancer now suspends tooling at the point of use for better ergonomics, instead of just lying on the bench.

ESS turbine starter assembly cell results:

- Reduced cycle times by 56 percent, WIP by 80 percent and overall cell footprint by 61 percent.
- Went from manual tooling to the use of electric assembly tools that are faster and provide better ergonomics.
- Before, grease and transmission fluid was manually measured and dispensed. Now, electronic dispensing tools are used that are faster, more accurate and cleaner.
- The cell also went from manually lifting turbine starters to using a balancer in transporting these products to the test, paint and packaging area.

"We had one situation," recalls Lugeenbeel, "where an employee was walking 278' to complete the work necessary at a particular cell. We reduced that to 8'. So not only is that cell more productive, but that employee is more effective because he's not walking all day. He's fresher at work and he doesn't leave here as tired. Basically, we created a better overall situation that benefits the employee and the company. Plus, we significantly reduced the floor space consumed by that cell."

Opening up floor space seems to be a driving force behind the improvements at Southern Pines. "So far our Kaizan initiatives have helped free up about 15,000 square feet of space on our production floor, without decreasing people or capabilities," states Lugeenbeel. "Whether it's here or anywhere in U.S. manufacturing, I think the best way to grow is to find ways of attracting new business without making huge capital investments. Basically, what we've done here is not only make each work cell more efficient, but created the potential of bringing additional business to this plant because we have the physical space. This helps Ingersoll-Rand stay competitive and keeps our facility open to playing an expanded role down the road."

While the improvement process is, of course, constant, the team of Lugeenbeel, Sanders and Terry Beasley are ready to move from the individual work cells to the facility's inventory management strategy. "We're constantly looking for the next bottleneck or area of production that can be improved," states Beasley. "We're also looking to implement these same Six Sigma principles in the finance department and our supply chain."

The Difference Makers

"A great workforce made the transition easier," recalls Sanders, who has been at the Southern Pines facility for about 8 months. "We knew we had to keep everyone involved, which is why an hourly employee is always part of the Kaizan event teams."

These teams comprise 7 - 9 people and always have at least one hourly employee. Every team member receives 2 - 4 hours of Kaizan training and each has an equal

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voice on these teams. Before any changes can be finalized the majority of hourly employees involved at the work cell or production area must endorse them.

"They saw how their jobs were made better and easier, so now everyone wants to know when the next round of improvements can be made to their cell," states Beasley. "But we've also empowered people to make these changes themselves, without a formal event."

Part of this empowerment also meant selecting three hourly employees and training them to be team leaders. Lugeenbeel, Sanders and Beasley felt this only made sense, given the amount of experience that was available to draw from on the shop floor. Additionally, direction for any changes or improvements were now coming from their peers, not a brand new management team.

"Change is never easy," offers Lugeenbeel, "but you have to do things in manufacturing in order to keep pace with the rest of the world. In our case we were very fortunate, because everyone here embraced these changes, and as a result we've been able to make a very good plant that much better."

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