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Tube, pipe producer executes 3-phase improvement plan
Trinity plan focuses on line workers, equipment, management

January 18, 2013

In the aftermath of the financial crisis of 2008, Trinity Products devised a trinity of improvements: worker knowledge and skills, equipment upgrades, and management training. Assisted by Lincoln Electric in selecting equipment and developing its training programs, the company doubled its throughput from 2,000 to 4,000 tons per month.

Since it was founded as a pipe distributor in 1979, Trinity Products, O'Fallon, Mo., has been expanding its horizons.

It added fabrication services in 1986 and began pipe production in 2007. Trinity's product portfolio includes 24- to 127-in. pipe up to 1-in. wall thickness. It serves customers in construction and related industries—piling contractors, road-boring contractors, utility contractors, and customers in the caisson industry—providing products for everything from billboards to building structures.

However, it knew that its product quality and customer diversity weren't necessarily enough to be successful in this competitive industry.

Management knew that it would have to take steps to make its products stand out from the competition's as the economy slowly recovered from the financial collapse of 2008.



Edge preparation and presentation are just as critical in spiral welding for pipe as they are for any other welding process. As part of its quality improvement plan, Trinity installed laser-based measuring devices that help to eliminate human error.

"In such a challenging economic climate, business as usual wouldn't ensure survival of this family-oriented company," said Robert Griggs, president of Trinity Products.

So in 2011 Trinity's management embarked on a three-phase quality improvement plan to help the company achieve success and growth, despite the rough economy.

All Eyes Focused on Weld Quality

Trinity's business culture is based on open-book management, inspired by Jack Stack and Bo Burlingham's work *The Great Game of Business*, which encourages employees to be actively involved in issues that affect their jobs. It has also helped the company execute its three-phase plan.

As part of this business philosophy, company management shares financial information with all employees at regular monthly meetings and actively seeks input and suggestions on current issues from its workforce. The company's incentive program rewards all employees equally with an annual bonus if the company meets various goals for

sales, productivity, safety, and quality.

Phase One of the plan focused on improving productivity and the weld quality of Trinity's products. Management began by tracking the amount of time that production was shut down for operational reasons, maintenance, and mechanical breakdowns, and then analyzed this information to identify and address recurring issues. It wasn't long before they realized that simply improving mechanical maintenance would allow them to run the mills faster and for longer periods, increasing throughput.

Next, management set new fabrication standards and tolerances, with emphasis on training, tracking, inspecting, and logging. They also created pictures of reference welds and repairs and developed a system for regular employee training, including new weld training manuals.

To continue to improve the mill's output, Trinity turned its attention to the input, tracking the raw material quality and vendor performance. The company then provided feedback to the vendors to find ways to manufacture materials that better fit Trinity's needs. In doing this, management discovered that each vendor had its own individual product strengths, so they developed plans to evaluate vendors on a continual basis to align the materials they procure with the specific products they make.

Additionally, the company recorded and benchmarked such factors as mill speeds, welding current and voltage, and macroedge quality.

Finally, the company offered classes to its employees focusing on fabricating techniques and the technical aspects of making pipe. These courses were designed to expand employees' knowledge and skill sets, thereby improving weld quality and ultimately increasing mill speeds. The classes also addressed new areas for the workers: inspection and handling.

Phase One is testimony to the company's overarching management philosophy.

"Every employee has an equal voice," said Jim Nazzoli, COO. "It doesn't matter who you are ... everybody's job is as important as everybody else's."

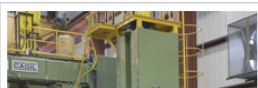
Ramping up Productivity

After the quality was improved, the Phase Two focus turned to productivity improvements.

"You have to start with quality product. Once you have quality dialed in, then you can ramp up production speed," said Nazzoli.

To improve the mill's productivity, the management team started by focusing on the welding power supply, looking for a good fit for its three-phase plan. It looked for a machine that would provide a variety of settings for the various products it makes, as well as provide monitoring capabilities. It chose Power Wave® AC/DC 1000® machines from The Lincoln Electric Co. The power supplies have software that allows Trinity's shop floor to monitor their machines live and use the vendor's website as a resource for troubleshooting. Employees can even take an electronic snapshot of any issue and send it to the supplier for diagnosis.

Trinity also installed new equipment and controls from Uhrhan-Schwill, which specializes in welding systems for large-diameter pipe. This new equipment provided the company with a stable welding head system that positions the welding electrodes where they need to be and holds them there.



Spotlight on Management Skills

After addressing weld quality and mill productivity, Trinity began to focus on the plan's third phase: management skills. The company now offers regular management classes to its employees, including sessions on leadership, communication, and quality control. The company says it is

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Trinity's new welding units provide more waveforms and frequencies than the company's previous machines, allowing the company to tailor the weld profile to correspond to a bigger variety of alloys, material thicknesses, and line speeds than before.

leadership, communications, and quality control. The company says it is dedicated to fostering key skills the staff needs to grow into the role of future company leaders.

"We place a high value on hiring the right people and providing an opportunity to make a lasting and meaningful career," said Griggs. "This involves placing them in the right position for their skill sets and nurturing them with ongoing training and development."

Trinity now also offers an annual continuing education course (pipe school), whereby customers' professional engineers can receive 13 continuing education credits while receiving instruction on how steel pipe is made, how to identify high-quality products, and insights into the latest products and technologies. The classes aren't led just by Trinity management; other pipe vendors are invited to make presentations. Thinking beyond their own bottom line, the company's goal is to educate its customers about the importance of pipe mills and what they can offer.

Tallying It Up

The plan has led to several positive results, including new production records.

"We're seeing nearly 100 percent improvement over where we were two years ago," Nazzoli said. "We used to celebrate producing 2,000 tons a month. Now we expect to produce almost 4,000 tons a month."

Improvements show up other areas, too, such as its flux consumption. Measured by determining the wire-to-flux ratio, this number has improved from 3-to-1 to a range of 1.3- to 2.1-to-1. This improvement, gained by partnering with Lincoln Electric to improve the flux delivery and recovery processes, might not seem substantial, but in fact it is; the result is a savings between \$50,000 and \$100,000 per year.

"We're doing quite well in these tough times," said Nazzoli. "When the economy turns around, we'll be in a good position. We've worked hard in these lean times to position ourselves."

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