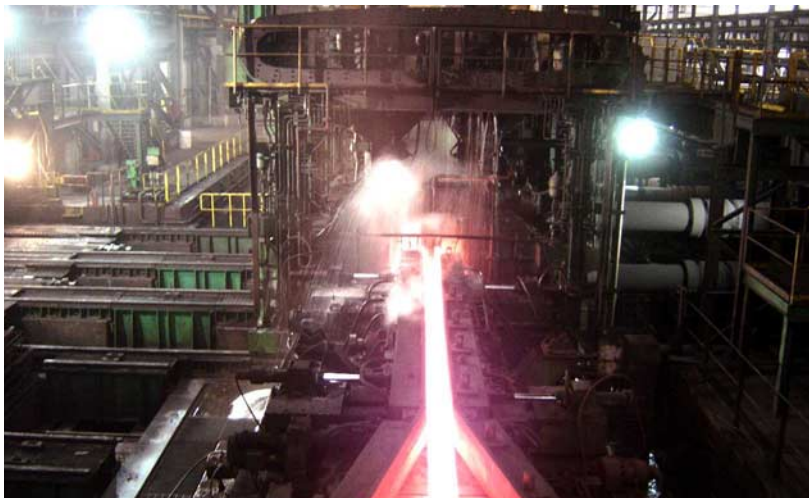

TXI Chaparral Steel

Designed for Success

Results

- Automated manufacturing drives on-time order shipments to customers
- High reliability and increased uptime
- Greater flexibility permits modifications without affecting production
- Speeds operator training
- Smooth upgrades

"You can't stay in business as a steel manufacturer unless you ship your products on time every time. The reliability of our automation throughout the plant helps us to do this."
David Quesenberry
Automation Manager
TXI Chaparral Steel

TXI Chaparral Heats Up Manufacturing and On-Time Shipping with Sophisticated Automation at Virginia Plant

As one of the largest suppliers of structural steel products in North America, TXI Chaparral Steel is always looking for ways to be the low cost producer. Its plants in Texas and Virginia process and ship over 2 million tons of steel per year to customers in the construction, defense, automotive, mobile home and energy industries. While the Company's raw production figures are impressive, processing prowess alone isn't enough to maintain an edge in this highly competitive industry. In addition to the high importance on the quality of TXI Chaparral's products, the Company also needs the ability to ship their products on time – and that means highly reliable manufacturing, with automation to help keep processes running smoothly.

Improving Its Mettle
TXI Chaparral's advanced steel manufacturing process starts with the purchase of recyclable scrap—such as cars, old appliances and other disposable metals—that is shredded into fist-size pieces. Using the Company's patented technology, a continuous caster then shapes and cools the molten steel into usable billet for the rolling process, where the billet is shaped into marketable products like I beams, H beams, rounds and sheet pilings. The products are then sent to finishing operations, including straightening, cutting to length, piling, and banding, before shipping.

"All of these manufacturing processes are interconnected, and our success depends on our ability to move the steel seamlessly through each of them for on-time delivery of every order," explains David Quesenberry, Automation Manager for TXI Chaparral Steel.

imagination at work

As a result, Quesenberry and the team at TXI Chaparral contracted with partner AMI to design, specify and implement an integrated, highly reliable automation system for their Virginia plant. The 650,000-square-foot plant, which is located on a 725-acre site, produces 800,000 tons of steel per year.

"Since this is such a large facility, designing and specifying a completely integrated automation configuration proved to be a complex task, and our engineering groups worked very closely with TXI Chaparral to make sure that everyone would be happy with the solution," says Bernardo Sainz, who was the engineering manager with AMI on the project.

After a careful review of many solutions, AMI and TXI Chaparral decided to install GE Fanuc Series 90™-70 and Series 90-30 PLCs, Genius® I/O and CIMPLICITY®* human machine interface (HMI) software – which ensured high reliability as well as tight integration with GE drive systems.

* Part of Proficy Intelligent Production Solutions from GE Fanuc.

From melting to shipping, all of the plant's processes and equipment are controlled using intelligent I/O communicating with the PLCs and drives via a Genius LAN. Information from the control system is sent via Ethernet to the HMI software running on terminals located throughout the facility.

"With our plant-wide system, we've enhanced reliability and flexibility, including the ease with which we can configure programs and the ability to troubleshoot either over the network or at a specific I/O block," Quesenberry says. "We have built in ways to get real time savings through the system – for example, we make changes off-line and then download them to the system so that the I/O configuration can be changed without shutting down production."

Additionally, the team has taken advantage of greater ease of use and the expanded functionality of the automation system's operator interface. AMI's Sainz, explains, "For example, the system offers better quality screens with more colors and gradients, and faster communication that enables the rapid refresh rates that are so important on the rolling mill."

Furthermore, Quesenberry adds, "We built such a close visual representation of our process that any new operator could come in not knowing what we do and quickly have a good idea of what goes on in this plant and where every piece of equipment is located – which has been a great savings on training and improved operator response."

For enterprise-wide communication, the team is capturing and transmitting all of the plant data to TXI Chaparral's business information systems. Quesenberry is performing tests now on GE Fanuc's data Historian – which collects, archives and distributes plant floor process information at extremely high speeds in real time. Scalable to 100,000 data points per server, the system delivers high-volume data collection and retrieval, which can afford TXI Chaparral greater visibility into manufacturing operations in order to analyze and improve both performance and bottom line even more.

Since becoming operational, TXI Chaparral has realized numerous benefits at the Virginia mill as a result of automating the plant. Most notably, high reliability helps to enable TXI Chaparral to manufacture and ship its processed steel on time. Because the system is so easy to use, operator learning curves—and training costs—have been greatly reduced. Lastly, with common components throughout the system, Quesenberry has reduced spare parts inventories and their associated costs. And, that's putting the pedal to the metal!

GE Fanuc Automation Information Centers

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86-21-3222-4555

Additional Resources

For more information, please visit the GE Fanuc web site at:
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