Case Study

Honeywell Wireless Solution Improves Steel Mill Performance

"With Honeywell’s wireless solution, we have been able to improve our furnace process. Access to new temperature readings has allowed us to upgrade the furnace and expand production by 15 percent. The return on investment has been significant.”

Melt Shop Electrical Supervisor, Nucor Corporation

Benefits

Nucor Corporation faced the challenge of improving process operations in an extreme environment at its steel recycling mill in Tuscaloosa, Alabama. With the support of Honeywell’s wireless solution, the Nucor mill has been able to increase production performance and lay the groundwork for future advancements in production efficiency.

The mill was able to realize the following benefits:

- Increased production of 15 percent through furnace upgrade
- Improved production efficiency through more accurate data
- Improved safety through greater ability to measure process status
- Faster, more reliable access to data
- Improved quality of data to enable better decision making
- Reduced maintenance requirements compared to wired transmitter alternative
- Provided foundation to expand wireless efforts across the mill and enhance process reliability

Background

Nucor Corporation is the largest steel producer in the United States and had net sales of $12.7 billion in 2005. Nucor is also the nation’s largest recycler. In 2004, Nucor recycled approximately 17 million tons of scrap steel, with 5 million of those tons being automobiles.

Nucor’s products include carbon and alloy steel in bars, beams, sheet and plate, steel joists and joist girders, steel deck, cold finished steel, steel fasteners, metal building systems and light gauge steel framing.

The Nucor steel mill in Tuscaloosa is a hot rolled coil and cut-to-length plate mill that manufactures carbon and high-strength low alloy steels for structural and pressure vessel applications.

Challenge

Nucor’s Tuscaloosa steel mill was faced with the challenge of improving process operations on one of its furnaces used to melt and recycle steel. To help support an increase in production levels, operations staff searched for a reliable way to monitor temperatures around the furnace in areas not previously monitored. The ability to gather this data would facilitate a furnace upgrade and subsequent increase in production.

A key requirement was to be able to instantaneously know what temperatures were in the furnace, which can reach more than 1,000 degrees Fahrenheit, to protect from a production upset if temperatures were to get too high.

Another concern was the huge magnetic field that exists around the furnace, a result of running over 120,000 amps to the furnace, and its impact on transmitter functionality.

Solution

The Nucor mill turned to Honeywell to help overcome the challenge of obtaining accurate and reliable temperature readings on its furnace. The use of wireless technology was seen as the better way to get these readings given the extreme environment. Nucor worked with Honeywell to come up with a solution that included the placement of wireless transmitters just a few feet from the base of furnace flames. The transmitters were installed on the cooling circuits for the furnace and encased on specially built protective boxes to withstand the extreme heat.
Honeywell’s wireless solutions can improve performance and efficiency in extreme environments.

“With the use of wireless transmitters, we were able to start monitoring a part of the mill that was previously not possible, which has allowed us to completely upgrade the furnace and increase production,” said the Melt Shop Electrical Supervisor at the Nucor mill in Tuscaloosa.

As a result of the positive experience with the wireless solution from Honeywell, Nucor has decided to pursue the installation of wireless devices throughout the entire mill.

“We believe the potential for wireless technology at our mill is huge,” said the Nucor supervisor. “We are looking at extending wireless coverage right across the mill — eventually facilitating the removal of hard wires and significantly improving equipment reliability and overall mill performance. With wireless technology, we’ll be able to focus efforts on more efficient means of collecting the data we need from the field.”

Nucor is planning to use wireless technology to increase the amount of preventive maintenance performed by enabling field staff quick access to real-time information such as online maintenance checklists and drawings.

“Right now, field employees have to print out this maintenance information and walk around with it,” said the Nucor supervisor. “With wireless technology in place, the field will have everything electronically at their fingertips.”