

Wireless Technology allows measurement in harsh environment



RESULTS

- Furnace efficiency, safety improved
- 50% installed cost savings over wired solution
- Seven-day installation compared to six months



APPLICATION

EMF measurement in the blast furnace hearth walls to determine the pig iron level inside

CUSTOMER

Ternium Siderar is the biggest steel company in Argentina. Products include hot rolled, cold rolled, hot dip galvanized, electrogalvanized, prepainted and tinplate steel sheet products.

CHALLENGE

Steel producer Ternium Siderar wanted to collect electromotive force (EMF) measurements from the blast furnace hearth at its facility in San Nicolás, Argentina. It wanted to use the data to calculate the amount of pig iron in the hearth. For the past several years, several furnaces worldwide have used this technique to determine iron levels, but the cost of hardware and infrastructure needed to implement a wired system is very high. The layout and high temperatures in the steel runner also make it difficult to use a wired solution.

A wired network would have had to be installed during the furnace's routine maintenance stoppages, which are scheduled every two months. The entire installation would have taken six months in all. Because this is a developing experimental technique, the determination of where best to locate the electrodes can't be determined in advance. Electrodes must be relocated as needed to detect the best possible signal. This also would have taken months with a wired solution.

The conditions at the hearth include temperatures of 60° Celsius and a lot of electromagnetic noise.

“The 648 Wireless Temperature Transmitters are working near tapholes where temperature reaches 60°C and under electromagnetic noise with good and stable signal.”

Esteban Pagliero,
Electronic Engineer

SOLUTION

Ternium installed five wireless Rosemount® 648 transmitters on electrodes that are soldered near tapholes onto the blast furnace's hearth's shell. The devices transmit the EMF measurements every 3 seconds to a Smart Wireless Gateway 50 meters away in another room. The gateway uses modbus to connect with the SCADA.

Because there is no cabling to deal with, the devices can be easily repositioned to enable the best data collection.

RESULTS

By using Smart Wireless, which works well under the extremely harsh conditions, the correlation between EMF and the amount of iron and slag inside the hearth is determined successfully and with good measurements. The ideal blast furnace operation is at a constant level.

"We've improved furnace energy efficiency, process stability, and safety," said Esteban Pagliero, electronic engineer for Ternium Siderar. "It decreased our installation costs and time considerably. We gained a 50 percent installed cost savings with the wireless solution."

A wired network would have had to have been installed during routine maintenance stoppages of the furnace, which are scheduled every two months. The entire wired installation would have taken six months in all. Installation and start-up, including finding the optimal location for the process measurement, was completed in seven days.

Wireless technology also gave Ternium the ability to easily move the transmitters whenever it needed to move the electrodes. It would have taken months to do so with a wired network.

"The 648 wireless temperature transmitters are working with a good and stable signal near tapholes where temperature reaches 60°C and under conditions with a lot of electromagnetic noise. No problems have been observed since installation," Pagliero said. "The equipment has been operating constantly with small error rates."

"We've improved furnace energy efficiency, process stability, and safety."

Esteban Pagliero

Emerson Process Management
Southern Cone
Avda. Maipu 660
Florida, B1602AAT
Buenos Aires, Argentina
T (54) 11 4837-7000
www.emersonprocess.com.ar

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