

SENSICAST

CASE STUDY

MONITORING GIANT FURNACES

There are few places more inhospitable to a sensor than a steel plant. Extreme temperatures and harsh chemical, metallurgical, and mechanical processes make any monitoring a challenge.

Yet process monitoring is critical to a steel plant's profitability. Tough competition in the world steel market holds prices down. Any unexpected maintenance shutdowns reflect directly on the bottom line.

At a point in steel making, electrical current often arcs to the sides of the furnace. This super heats the furnace wall, sometimes overloading its temperature control mechanism. If the cooling system is allowed to fail, the molten steel could burn through the walls of the furnace in a matter of minutes, allowing molten metal to pour out onto the shop floor, endangering workers' lives and millions in equipment. Then, needless to say, the plant would be down for a significant period of time.



For one major steel manufacturer, it was critical to find an accurate and cost effective way to monitor and record temperature fluctuations within the water jackets of their giant furnaces. After much research, they chose Sensicast wireless mesh network temperature sensors.

THE HARSHTEST ENVIRONMENT - A "COOL PERIOD" OF 125°F

With 24/7 production, there was almost no downtime to install or replace the sensors. They had to be placed or replaced quickly during a brief cool period in the melting cycle. Even during these "cool" periods the temperature at the sensor site measures over 125°F!

The need for a quick installation, the high heat, and difficult positioning made installing wired sensors impossible. Plus, molten steel splashing around would vaporize any wires it touched!

Simple traditional wireless monitoring techniques were out, too. Strong magnetic and electrical fields, plus the large masses of steel would interrupt their transmissions, causing communication outages. In an application where a minute's delay can mean disaster, this was not acceptable.

Sensicast H900 RTD nodes were placed between the inner and outer walls of the furnace. They were able to withstand the heat from melting steel, wide temperature swings, powerful magnetic fields, water spray, and vibration.

SENSINET NETWORKING: ULTRA-RELIABILITY

SensiNet smart mesh networking routes data around any temporary trouble spots that might occur. Frequency hopping lets the H900 nodes search out the best channel for clear communication. This insures a constant and accurate flow of information to the plant's maintenance and management teams.

Impressed by the reliable operation of the initial Sensicast monitors, the steel plant has since installed a Sensicast OPC system to deliver data directly to its control system. The company depends on this critical information to handle preventive maintenance more efficiently, eliminating the unscheduled downtime that can turn a profitable steel plant into a loser.

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