

Smart Wireless Technology Helps CalPortland Company Comply with Air Quality Regulations at California Cement Plant

BENEFITS

- Self-organizing wireless network reliably monitors cement kiln's NOx emissions reduction process despite rotating equipment and harsh conditions
- Enables compliance with quality emissions requirements
- Installation of the devices completed in one day



CHALLENGE

The gradually-sloped 540-foot-long, 13-foot-diameter kiln rotates almost twice a minute and operates at temperatures as high as 2,800° Fahrenheit. The company uses a Selective Non-Catalytic Reduction (SNCR) process of spraying ammonia into the kiln to control NOx emissions. It needed to monitor the temperature of the ammonia, the process gases as well as the kiln's slight vacuum. It had tried using a slip ring around the kiln to check these parameters but frictional wear ground down the ring and the growth of the kiln as it heated up broke insulators isolating the process signal.

SOLUTION

The CalPortland installation includes Emerson's self-organizing wireless network of field instrumentation that reliably monitors the process used to reduce NOx emissions inside a rotating cement kiln at the facility. NOx is a byproduct of the pyro process involved in the chemical procedure of cement manufacture.

The wireless network includes four of Emerson's Rosemount® wireless temperature transmitters, one wireless DP transmitter, and a Smart Wireless Gateway. CalPortland chose wireless because it was the best solution that could meet the very challenging application. "The rotation, extreme temperature, and the location of the kiln (at 20 to 40 feet above grade), made using a wired solution impractical," said Steve Tyrrell, CalPortland senior electrical supervisor.

"By installing this wireless network, we were able to monitor and treat the NOx in the kiln successfully when there was no other alternative."

Steve Tyrrell
Senior Electrical Supervisor, CalPortland



Emerson's Smart Wireless technology reliably monitors the process used to reduce NOx emissions inside a rotary cement kiln at CalPortland's cement plant.

RESULTS

The installation of the four devices onto the kiln was completed in one day. The DP transmitter was installed on the injection shroud to measure the extremely low vacuum inside the kiln. The temperature transmitters were installed at different locations around the kiln.

The self-organizing network transmits signals reliably to a Smart Wireless Gateway despite the fact that devices are installed at opposite sides of the kiln. The line-of-sight view is blocked at times between some devices and the gateway but no data has been lost. The gateway is integrated with the facility's existing PLC control system.

By installing Emerson's Smart Wireless network, CalPortland was able to monitor and treat the NOx in the kiln successfully when there was no other alternative, and enabled them to comply with the NOx emissions regulations and improve control over the process.

“With a rotary kiln, the continued addition of process variable instrumentation to optimize the control strategy becomes overwhelming. The wireless option allowed for movement of the process indicators to various positions on the kiln for development of the control strategy.”

Steve Tyrrell

Senior Electrical Supervisor, CalPortland

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