

Emerson's *WirelessHART*™ Transmitters Monitor Biomass Gasification Pre-combustion Chamber at Polish Power Plant

BENEFITS

- Increased protection prevents damage to rotating chamber walls
- Long-term reliable data transmission despite tough working environment
- Wireless under consideration for temperature measurement as part of the control of the burning process



CHALLENGE

Elektrownia Stalowa Wola S.A. (part of Tauron Energy) – power plant, Stalowa Wola, Poland produces power and heat by a new gasification system using forest waste wood (including chips and dust) and other biomass material from agriculture. The organic waste passes through a 9m long by 3.5m diameter rotating pre-combustion chamber where it is heated using natural gas to a temperature between 280-360°C. The pre-combustion chamber is made from a ceramic material which is protected from damage by a layer of insulation. To further safeguard equipment, Elektrownia Stalowa Wola wanted to measure the temperature of the pre-combustion chamber walls so that they could be alerted to any potential problems that could damage the chamber walls. Because the chamber rotates, wired transmitters would have required a slip ring assembly to connect the sensors. However, dirt, carbon dust, and other forms of contamination build up in this area which can lead to flash over (arcing between the rings or to ground) and damage the connections between the lead and the rings.

SOLUTION

Two sensors have been installed within the insulation material to provide the temperature measurements of the chamber walls. These are connected in a *WirelessHART*™ network including two Rosemount® wireless temperature transmitters installed on the rotating chamber delivering measurements every 30 seconds. This Smart Wireless solution provides the operator with the information needed to protect the chamber from overheating.

*“With every day usage creating the potential for high contamination, we were concerned about the long-term reliability of a slip ring solution. Wireless was the natural alternative and Emerson’s *WirelessHART* devices also meet the EX requirements.”*

Mirosław Lysikowski
Instrumentation & Control Manager
Elektrownia Stalowa Wola S.A.

A further transmitter has been installed nearby and acts as a router, strengthening the self-organizing wireless network by providing an extra route for signals to pass through. Measurement data from the sensors is sent via a wireless gateway to the existing Emerson Ovation® expert control system that controls the biomass gasification process.

RESULTS

The sensors and transmitters were installed by Elektrownia Stalowa Wola during a routine shut-down period, taking just two days to complete. Start-up of the wireless network took only a matter of hours, including installing the Modbus TCP/IP cabling that connects the gateway to the control system. Emerson's AMS® Wireless SNAP-ON™ application validated the wireless network and is now used to manage the network and identify any potential trouble spots.

Elektrownia Stalowa Wola is currently considering increasing the number of measurements on the rotating chamber to increase their knowledge of the process and then using wireless temperature measurement as part of the control of the burning process.

“We are extremely happy with the final solution, which has proved to be very reliable. Looking to the future, we expect to use these new measurements for process monitoring and will also be working with Emerson to further expand the use of wireless technology.”

Mirosław Lysikowski
Instrumentation & Control Manager
Elektrownia Stalowa Wola S.A.

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