Wireless Keeps UK Power Generator Above Water Data

Emerson [1]'s Smart Wireless technology is helping E.ON UK accurately monitor and measure treated water usage, thus allowing trending and analysis to formulate target values at the company's Kingsnorth dual-fired power station.

Using Emerson's Rosemount® wireless transmitters, E.ON is now able to collect flow measurement data from new flowmeters installed throughout the turbine hall. The self-organizing wireless network delivers the data for trending in an OSIsoft PI historian, which helps personnel monitor water usage within the system.

E.ON Kingsnorth, a 1,940 MW-generating facility located on the Medway Estuary in Kent, UK, needed a solution to monitor and measure water usage within its main plant. The company decided to install new non-intrusive ultrasonic flowmeters to carry out this task. The high cost of wiring associated with a conventional cabled solution and a desire to embrace the very latest networking technology led E.ON to evaluate wireless technologies that could meet its needs.

"E.ON is keen to adopt the very latest technology to help improve productivity, efficiency and availability, and wireless technology provides the ideal networking solution to access the flow measurement data from the turbine building without having to install new cabling," says Chet Mistry, team leader, E.ON UK.

Having initially undertaken extensive trials of Emerson's Smart Wireless technology, E.ON selected the solution because it offered high levels of reliability and long transmitting distance, as well as the ability to add additional devices to the network without the need for additional infrastructure.

The turbine hall at Kingsnorth is around 500-m long and presents a difficult working environment for wireless as it houses large turbines, vast amounts of metal piping and a number of metal walkways that could interfere with the wireless signal. Such an environment would not be suitable for a line-of-sight wireless solution, but Emerson's self-organizing technology encountered no problems in terms of routing data back to the gateway or reliability of connection.

"We have great confidence in the technology. The self-organizing network provides redundant routes for the data to pass back to the gateway. The resulting wireless mesh network delivers high reliability," adds Simon Lark, control and instrumentation engineer, E.ON UK.

With Emerson's technology, each wireless device can act as a router for other nearby devices, passing messages along until they reach their destination. If there is an obstruction, transmissions are simply re-routed along the network until a clear path to the Smart Wireless gateway is found. As conditions change or new obstacles

are encountered in a plant, such as temporary scaffolding, new equipment or a parked construction trailer, these wireless networks simply reorganize and find a way to get their signals through.

All of this happens automatically, without any involvement by the user. This self-organization optimizes data reliability while minimizing power consumption. It also reduces the effort and infrastructure necessary to set up a successful wireless network.

"We were initially a little skeptical of the claims made for wireless, especially considering the environment we would be placing it in. But installation was quick and easy, and we just switched them on and they all worked," mentions Lark.

E.ON UK installed 14 Rosemount wireless transmitters to provide access to flow percentage readings from the new non-intrusive ultrasonic flowmeters monitoring different sections of the turbine hall. Every 15 seconds, the transmitters send flow measurement data to a Smart Wireless gateway, which is located in the main administration building on the other side of the road from the turbine hall.

"The gateway is situated in a windowless room within the main building. Despite being totally surrounded by brick walls, when switched on, the wireless transmitters were all clearly visible and immediately connected to the gateway," according to Lark.

Using Ethernet, the data is sent from the gateway to Emerson's AMS® Suite predictive maintenance software (which manages the wireless transmitters), and uses its OPC server to import the flow data into the PI data historian. From here, operators view trends and pinpoint where any loss of flow takes place.

The 14 transmitters took around two hours to configure and then less than six hours to fully install within the plant. In contrast, a wired solution could have taken between one and two weeks to complete.

"This initial installation of wireless is providing us with valuable experience," says Mistry. "We are now hoping to be able to use this experience to apply the technology to a range of applications including accessing valve diagnostic information."

Links:
[1] http://www.Emerson.com