

Keeping track of river waste water temperatures

Wireless transmitters from Emerson have enabled the Lenzing Fibers mill in Austria to monitor river water temperatures more reliably. PMD reports

The monitoring of river water temperatures at the Lenzing Fibers mill in Heiligenkreuz, Austria has been made easier by the successful application of Smart Wireless techniques supplied by Emerson Process Management.

Installation of the wireless temperature transmitters provides a cost effective and highly reliable solution for the company to meet government environmental regulations related to the temperature of water discharged into rivers and watercourses.

Lenzing Fibers is part of the Lenzing Group, and based in Austria, which is the world's largest producer of cellulose fibre, using beech wood from managed sustainable forests as its raw material.

More than 60,000 tonnes are produced annually at Lenzing Fibers, primarily for the textile industry with typical end products being clothing and home textiles in addition to other special fibres for hygiene and technical applications.

Lenzing Fibers believes that adopting innovative technologies and putting major investment into environmental protection has established the company as the quality, technology and environmental leader for man-made cellulose fibres. As well obtaining as their raw material from a sustainable source, the company's environmental protection policies and

equipment are highly evolved. High environmental standards enable the company to reduce its impact on the area surrounding its sites as well as enabling it to stay ahead of local, national and European regulations.

At its Heiligenkreuz mill and integrated fibre plant near the Hungarian border, Lenzing Fibers uses water drawn from the River Lafnitz for cooling purposes within the plant. Following its use within the facility, the water is returned to the river. Although the returned water is completely clean, during the process the temperature is raised slightly. Local environmental regulations require that any water returned to the river must not be more than 3 Centigrade degrees higher than the water extracted. In addition, the regulation stipulates that the company must maintain a constant check and record of the water temperature at both inlet and outlet points.

Because the nearest control room is located about 200 meters from the river, this presented a problem in connecting the remote temperature sensors back to the control system. Lenzing Fibers was faced with an expensive measurement solution if it was to use temperature transmitters connected by wires. Cabling would need to be installed over large



LENZING FIBERS' MILL AND INTEGRATED FIBRES PLANT AT HEILIGENKREUZ NEAR THE HUNGARIAN BORDER



SENSORS MEASURE WATER TEMPERATURE AND TRANSMIT THE DATA WIRELESSLY TO A BASE STATION

distances and across open ground where providing containment and protection would be costly.

"Because of the distance of the river from the control room and the fact that the general public is free to walk by the river, we would have had to dig a trench for the cabling and this would have been very expensive. The cost of installing wireless is much lower and has made this project possible," said Wolfgang Gotzi, head of the Automation Department at Lenzing Fibers.

Prior to the regulations being introduced, Lenzing was already monitoring the water temperatures manually by making daily visits to the river. However to meet the environmental regulations there was a need to improve the reliability of the results and for these measurements to be easily stored and be made readily available for inspection. By implementing a solution that enabled online measurement, Lenzing Fibers was presented with an opportunity to reduce operational costs by eliminating the number of trips to the field (river) and to streamline the reporting.

A live demonstration of the Emerson Smart Wireless self-organising network convinced Lenzing Fibers that the technology would be suitable for their application so five Emerson Smart Wireless transmitters and a wireless gateway for their temperature measurement task were purchased.

Emerson's Smart Wireless solution is based on transmitters that 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 lorry, these wireless networks simply reorganise and find a way to get their signals through. All of this happens automatically, without any involvement by the user, providing redundant communication paths and better reliability than direct, line-of-sight communications between individual devices and a

receiver. This self-organising technology optimises data reliability while minimising power consumption. It also reduces the effort and infrastructure necessary to set up a successful wireless network.

The temperature of the river water at the extraction point is measured using a Rosemount temperature sensor. This is connected to Emerson's Rosemount Wireless 648 transmitter positioned well above the water line to protect it from any unusually high water levels. A similar setup exists 200 metres downstream at the outlet point where water is returned to the river. A third transmitter, a further 200 metres after the return point, provides the water temperature after remixing. A fourth transmitter is currently used as a weather station and is situated by a nearby lake that is used as a cooling water reserve. This device acts as a repeater and provides additional paths for the self-organising network ensuring the highest possible communication reliability.

"The Emerson technology was both easy to install and integrate and has been extremely reliable in



IF TRUCKS OR SHIPMENTS PREVENT LINE OF SIGHT TRANSMISSIONS, ALTERNATIVE ROUTES ARE AUTOMATICALLY FOUND

terms of data transfer. When all the transmitters were in place the network offered us a communications reliability of 100 percent, which is very impressive. We are currently looking at other applications where Smart Wireless can be applied," said Gotzi.

The Smart Wireless network is integrated into Lenzing Fibers' existing control system using the wireless gateway. This is attached to an external wall of the pump station control room which is located near the inlet measurement point.

The other two transmitters are located between 200 and 400 meters from the gateway. The standard range of the transmitters is about 200 metres, but the Smart Wireless self-organising network extends the range. The gateway is connected to the existing control network using an RS-485 serial connection. The temperature information from all the transmitters is fed back into a data historian to meet the environmental regulations.

Lenzing Fibers is currently using an Emerson ▶

◀ RS3 control system within the main plant as well as Emerson's AMS Suite of software applications. AMS Suite: Intelligent Device Manager is used to manage the new Smart Wireless devices, enabling the technicians to configure the devices, run diagnostic checks and monitor alarms and alerts. AMS Suite is also used to manage and store calibration information.

"The wireless transmitters have removed the need for visits to the river to take manual temperature readings," said Gotzi. "By moving to an online measurement and recording system it is enabling staff to turn their attention to other maintenance and operating tasks."

Smart Wireless has provided Lenzing with a cost effective measurement solution requiring no signal cabling and fast site deployment. Immediate measurement and trending of the water temperature could be made and results stored to comply with the environmental regulations. Furthermore the technology offered them both the ease of installation and the reliability of connection that they needed.

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About Emerson Process Management

Emerson Process Management is a leader in helping businesses automate their production, processing and distribution in the chemical, oil and gas, refining, pulp and paper, power, water and wastewater treatment, metals and mining, food and beverage, pharmaceutical and other industries.

It is a part of the Emerson group, based in St. Louis, Missouri, USA, which is a global leader in bringing technology and engineering together to create innovative solutions for customers through its network power, process management, industrial automation, climate technologies, and appliance and tools businesses. Sales in 2008 were \$24.8 billion.

Wireless networks improve communications with eye wash and safety shower stations

Safety response at the Boise Inc paper mill in St Helens, Oregon, USA, was improved by implementing Smart Wireless products from Emerson Process Management to monitor its eye wash and safety shower stations.

When one of the eight eye wash or safety shower stations at the mill is turned on, Emerson's Rosemount wireless discrete transmitters in the self-organising Smart Wireless field network, immediately communicate with the mill's operating system to activate an alarm in the facility's control room. This allows operators to quickly dispatch assistance to the station and investigate for possible injuries.

Prior to utilising Emerson's Smart Wireless solution, the plant did not have a monitoring network for its safety stations and instead relied upon individual radio communications to alert the control room.

"We have numerous people at our mill, including drivers who are unloading chemicals and who don't have an avenue to directly communicate with the operators," said Jeff Taylor of Boise Inc. "Although we use lots of radios at the plant, none of the contractors and only some of the employees have them."

The estimated cost to use hard wired monitors at the stations was 30,000 euros (US\$37,600). "We had looked into installing a wired network monitoring system, but it was cost prohibitive to do so," Taylor said. "By installing a wireless network instead of a traditional wired network, we were able to save about 60 per cent in installation costs."

The switches and Smart Wireless Gateway were easy to install and commission. Some of the switches are as far as 60 metres from the gateway. The gateway interfaces with an OPC server, which delivers reliable data to the mill's operating system. The robust wireless network monitors the switches every 15 seconds.



WIRELESS TRANSMITTERS REMOVE THE NEED TO VISIT THE RIVER TO COLLECT TEMPERATURE DATA AND, LEFT, ALERT SAFETY STAFF WHEN SHOWERS ARE USED AFTER A CHEMICAL SPILL

