

## Energy harvesting transmitters go on forever

Energy harvesting technology from ABB is enabling speciality chemicals manufacturer Robinson Brothers to monitor temperature remotely, without a power supply to the transmitter.

E&I manager Tom Rutter explains that he has been trialling the device on the plant's steam main and that, with WirelessHART remote fieldbus comms as well, the instrument has been installed without any cabling at all.

"The transmitter has been operating for about three months now and it's ticking all the boxes, without drawing any power from its back-up battery," says Rutter. "It looks like it could go on forever, provided there's steam flowing through the line," he adds.

The system was installed by ICA Services, which suggested exploring energy harvesting to eliminate cabling costs – which typically account for 50% of the device – in future instrumentation schemes at the West Midlands plant.



The ABB transmitter is powered by an on-board micro-thermoelectric generator (micro-TEG), driven by the temperature difference between the steam pipe and its surroundings.

ABB says that the micro-TEGs used in its transmitters provide a robust and compact solution for energy harvesting from hot or cold processes.

And with many industrial processes having an abundance of heat, the power that can be delivered by micro-TEGs should be sufficient to operate wireless sensors in a variety of locations.

The system at Robinson Brothers needs a minimum temperature difference of 30°C, which is easily achieved in this application, where the steam flows at around 106°C, while ambient air is typically 26°C.

ICA engineers set up the transmitter to send data to a remote wireless gateway, which feeds the signal into the site's existing Ethernet network and then to an ABB SM500F data recorder.

"I don't see any reason why we wouldn't be using the energy harvesting technology again, after such a successful trial," comments Rutter.

"We've already got over 10,000 measurement points around the site, but we don't have much wireless technology," he continues.

"It's something we'll be looking to do more of in future projects, because there are terrific cabling costs involved in installing conventional instrumentation and the potential savings are obvious."

## Cool energy savings for Fluorocarbon's Hertford site

Fluorocarbon, one of the largest fluoropolymer processors in the UK, is reporting cooling costs on track to reduce by 67%, following its installation of energy-efficient inverters and a free cooling system from specialist IsoCool.

If so, this gives the project, which has been funded with a loan from the Carbon Trust and Siemens Financial Services under the Energy Efficiency Financing Scheme, a payback schedule of less than two years.

Fluorocarbon's Hertford factory is one of the largest of five across Europe – with on-site processes including high performance coatings, engineering plastics, moulding and screw extrusion – and the new cooling system supports more than 70% of plant equipment.

Shaun Grundon, health, safety and environmental officer, explains that historically the cooling system consisted of a single water chiller with a 120kW cooling capacity and cost just over £20,000 a year to run.

"A few years ago, the cost of electricity on the site doubled from 7p to 15p per kWh," states Grundon. "We already had plans to improve energy efficiency, so we looked at the site as a whole and applied for the Carbon Trust/Siemens loan to cover four projects, of which the cooling system is the biggest."

Grundon says that, since the company had enjoyed



considerable success using IsoCool on previous projects, the company went back for more.

To reduce the energy consumption of the process cooling system, IsoCool retrofitted a separate RFC air blast cooler to the chiller. This provides the cooling source when ambient temperatures allow partial and up to 100% direct air cooling, so offloading the compressors and cutting

operating costs.

"An investigation into the weather conditions in Hertford showed that we could save a lot of money with free cooling," comments Grundon. "Our cooling system has an outlet temperature of 18°C, and the ambient temperature in this area is below that for about eight months."

IsoCool also identified further energy savings from installing inverters to the process pumps, to match operational speed to demand.

"Our water chillers used to be on 24/7, 52 weeks of the year," states Grundon. "They never shut down. Now, thanks to the free cooler, the main chiller only comes on two to three months a year. The energy savings are massive."

Based on the chilled water system running at 60% load factor, IsoCool calculated that the energy-efficient upgrades would lower the running costs of the cooling system to approximately £6,800 – just a third of the previous total.