

## Swedish tank farm stays safe with wireless

Absolute Energy is reporting increased uptime and reduced energy costs since changing to Emerson's Rosemount guided wave radar (GWR) to monitor water level in a condensate receiver.

The giant ethanol plant, near Lyle, Minnesota, USA, installed the system on a sieve dehydration process and reckons it has helped avoid shutdowns costing up to \$20,000 an hour, as well as potential equipment damage costing more than \$200,000.

"Our condensate receiver levels went from being a constant headache to hardly noticeable, because the GWR is so reliable," states Travis Rosenberg, maintenance manager at Absolute.

"The increased reliability has helped us to lower the risk of equipment damage, increase plant availability, decrease energy and utilities costs, and reduce maintenance costs," he adds.

Rosenberg explains that the condensate receiver is critical to



continuous operation of the heat exchanger and molecular sieve dehydration process.

If water levels get too high in the receiver, temperatures in the heat exchanger drop, which can cause wet ethanol to enter the molecular sieve beds. This forces the process to be shut down, while the ethanol-water mix has to be reprocessed.

Meanwhile, if temperatures drop in the heat exchanger and the upset occurs before the wet process stream is sent into the sieve beds, the heat exchanger has to be shut down and restarted – taking 20 to 30 minutes.

However, if the upset occurs and the sieve beds get wet, the process has to be shut down for between 36 and 48 hours, because the beds have to be regenerated and restarted.

Previously, the level was measured using differential pressure transmitters. However, excursions from high vacuum to low pressure made it challenging for DP cells, because fill heights in the wet legs varied too much, leading to errors in the region of 20%.

Hence the move to Emerson's Rosemount 5301 GWR transmitter and the 9901 chamber for external mounting – enabling the instrument to be isolated for routine maintenance, while still keeping the plant operational.

## Gorgon's Ex lighting saves local sea turtles

Cooper Crouse-Hinds reports that it has engineered an explosion-proof fluorescent light fitting for the Chevron-operated Gorgon project, at Barrow Island, that minimises disturbance of the local sea turtle population.

The firm is currently supplying more than 20,000 explosion-proof (Ex Zone 1 and Zone 2) fluorescent light fittings for installation on the LNG (liquefied natural gas) and domestic gas plant, currently under construction.

Graham Doran, director for Europe of the global projects group at CCH, explains that satisfying health and safety requirements, in terms of explosion protection, and ensuring that plant personnel can still distinguish the colour of safety and warning signs, as well as the sea turtle issues, posed significant engineering challenges.

The solution, he says, was the firm's eLLK 92 fluorescent light fitting, with special covers and light filters. Four types have been installed – including its 2x18W, 2x36W, and 2x36W, with battery back-up versions.



"Having to ensure that our lighting solution meets the needs of different groups involved – environmental, health and safety, and engineering – is a real challenge," comments Doran.

"One group wants a lighting solution as bright as possible, so that plant personnel can carry out their work in safe, bright lighting, whereas another requires anti-reflective lights that are as dim as possible, to protect the turtles."

In this case, the solution was main light output at greater than 560nm, to prevent turtles being attracted to the light. Another requirement was that the colour-rendering index (CRI) had to ensure safe working conditions. As Willi Steckel, product manager at CCH, puts it: "The CRI index measures how well a

colour can be identified by the human eye under artificial light."

Hence the range of filters tested. "After we found the appropriate filters, we then tested which one would give us the best colouring with the fluorescent tube. This part of the product testing alone took eight months. And, once we had a good selection of matches, we commenced the UV resistance testing of each filter type," recalls Steckel.

Interestingly, the company also had to ensure that lighting would not be directed upwards from the plant into the sky, so creating a halo effect that could confuse the sea turtles.

"We developed different shielding arrangements, depending on the mounting angle of the light fitting. Normally, a light fitting faces down, but there are situations on a plant where a light may need to be mounted sideways and, so for these units, we had to ensure that the light was supplied with the correct shielding for that particular mounting position," he concludes.

## Variable speed drives pay back for Rittal

Plymouth-based Rittal-CSM reports completion of the latest stage of its energy-saving carbon reduction programme, with Drew and Co having now installed more efficient pump controls at its paint plant.

Rittal-CSM maintenance engineer Nigel Brewer says that the firm achieved payback in just a few short months for the £17,000 package of Weg CFW-11 inverter drives.

The project involved improving energy use at its paint plant circulation and spray pump sets. Each pump set ran at a fixed speed, he explains, using conventional control gear. Both the flow rates and spray head volumes were controlled using manual valves.

"After we had conducted the energy audit, we realised that variable speed control was required on the pump motor," states Brewer. "We approached an inverter supplier and concluded a deal for a single VSD, a Weg CFW-11



unit, to be installed on one of the motors as a trial.

Brewer says the trial ran for several months and proved very successful. "But when we came to retrofit the remainder of the pump motors, we ran into problems. It was at this point we contacted Drew and Co, as we have worked together on many occasions and some of their engineers know our plant well."

"After consultation, it was decided to

install 10 Weg CFW-11 variable speed drives, ranging from 3kW to 45kW, on the pump motors," says Andrew Botterill of Drew and Co.

"Each variable speed drive was positioned in an IP65 Rittal enclosure, with forced ventilation and filtering, adjacent to its respective pump."

The new system meant that all manual valves, previously used for pump output control, were opened fully, with control taken over by the variable speed drives themselves.

Botterill explains that each was set up with a simple local speed control, enabling plant operators to set the optimum flow and volume for its particular application.

Drew and Co carried out all of the control panel modifications and on-site installation works during a single plant shutdown over a weekend. The paint plant started back into full production on the following Monday morning.

## ABB controls cut Tata Steel's oxygen costs

ABB control systems are helping Tata Steel cut the cost of iron production at its Scunthorpe plant by allowing it to use medium pressure oxygen in its blast furnaces.

The Scunthorpe site produces carbon steel by the basic oxygen method, and its previous pressurised oxygen plant was producing high pressure oxygen at 42 bar, whereas the three blast furnaces need 11 bar.

Tata, in partnership with BOC, built a new medium pressure oxygen plant on the site, together with a 4.5 km pipeline to serve the three blast furnaces – Queen Bess, Queen Victoria and Queen Anne, controlled by ABB Advant, 800xA and MasterView systems respectively.

"Each blast furnace already had an ABB AC450 controller," explains Gopal Chopra, ABB project manager. "So, to



allow the furnaces to use the medium pressure oxygen supply, we upgraded and expanded the controllers and linked them by a Modbus serial link to a PLC, which collects data about the operation of the furnaces, and provides information management and reports for all three. We also installed ABB S800 I/O, for the hardwired signals for

each furnace."

The new oxygen pipeline feeds the blast furnaces via a three-way valve station, with flow control to each continuously varied, according to the condition and oxygen demand of the furnaces. Both pressure line control and flow control are under ABB control.

"It is a very complex control system and everyone at ABB did a really good job," comments Ian Render, project engineer with Tata Steel.

"They were all very dedicated, from the software developers to the guys doing the commissioning on site," he continues. "The result is a very good control system that allows us to make use of a lower cost oxygen supply route. Overall, the project has been a big success."