

innovations

IN PROCESS CONTROL

“Improving process performance is all about understanding what is happening around the plant and being able to respond quickly to any problems.”

Ian MacDonald

Senior Control Systems
Engineer, Barking Power

*Read the full story
on pages 8 and 9*



Making a difference for those in the know



“DeltaV™ and its embedded APC tools, as well as its engineering and consultancy services, have been instrumental in helping achieve such a significant improvement in energy efficiency. The DeltaV distillation solution was customised for our application and was exactly what we needed.”

Attila Bodócs, Production Chief, **MOL**

MOL Group has improved energy efficiency and process stability at its gas distillation plant in Algyő, Hungary, by implementing advanced process control technology from Emerson. MOL upgraded the plant’s distributed control system to Emerson’s DeltaV process automation system. They then took advantage of the embedded advanced process control capabilities by adding Emerson’s SmartProcess™ Distillation Optimizer, which enables model predictive control for distillation columns. These technologies have improved control and optimised performance of the plant’s gas fractionation section, reducing energy costs by €1.2M per year. www.emersonprocess.com/IM012

“With Smart Wireless we minimise costs for cabling, cable trenches, conduits, and cable trays. Wireless also gives us the flexibility to add more devices in the future.”

Ali Erener, Project Chief Engineer, **Tüpraş Izmir**

Wireless TankRadar® Rex radar level gauges will improve accuracy and reliability of measurements on most critical oil-movement tanks at Tüpraş refinery in Turkey.

www.emersonprocess.com/IM016

“By detecting a change in conductivity, maintenance can be scheduled before the problem leads to an unplanned shutdown or damage to the plant.”

Emma Wilcockson, Electrical, Control & Instrumentation Technician, **SSE**

Emerson’s Rosemount® Analytical wireless transmitters help prevent unplanned shutdowns at SSE Heat and Power energy facility in Slough, UK.

www.emersonprocess.com/IM018

“With Syncade™ Logistics we were able to process larger than expected order flows in a highly efficient manner. The results show faster order handling and an efficiency improvement of up to 30%.”

Ton van Dijk, Global Director ICT, **Vopak**

Emerson’s bulk liquid terminal software application based on the Logistics module in Syncade deployed at Vopak fuel distribution terminal in Amsterdam, the Netherlands.

www.emersonprocess.com/IM019

“We are always looking for ways to improve the performance of our machines. Micro Motion® Coriolis technology is accurate, reliable and user-friendly, adding value for our end user customers.”

Marco Serventi, Sales Manager, **GF S.p.A.**

Italian high-tech machinery manufacturer GF S.p.A. has reduced filling times, improved accuracy and repeatability, and enabled tighter filling tolerances for its filling machines using Emerson’s Micro Motion FMT filling mass transmitter.

www.emersonprocess.com/IM017

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Welcome to **innovations**.



Emerson Process Management is continually looking to address the safety needs of plant operators with innovative technology. For example, in 2004, we introduced the world's first fully digital, integrated safety loop, with a modular logic solver providing scalability and taking advantage of field device diagnostics using HART® communications. Then, in 2009, we reduced the complexity of basic process control system engineering with the launch of Electronic Marshalling. Delivering I/O on Demand, this innovation eliminated entire subsystems and their engineering, providing a step change in project flexibility. Now, bringing these two innovations together is the next logical step and at the Emerson Exchange in Düsseldorf in May we did just that, announcing the DeltaV™ SIS Logic Solver with Electronic Marshalling. This was part of a combined launch of safety products that can help reduce the complexity of process manufacturing safety.

Another driver of innovation, particularly with the continued loss of experience within the industry, is improving the usability and ease in which our products can be installed, configured and recalibrated. We find that customers also want to be able to diagnose potential faults, minimise maintenance and reduce overall life cycle cost. We show how our latest solutions address these needs.

It's not just Emerson providing innovative products; our customers are also identifying innovative applications. We launched our wireless acoustic transmitters primarily to spot failed steam traps and reduce lost steam and wasted energy. In this issue, you will see how Barking Power has taken it further by applying the technology to monitor problematic valves and even boiler tubes.

Bob Sharp

President, Emerson Process Management Europe



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process manufacturing **SAFETY**



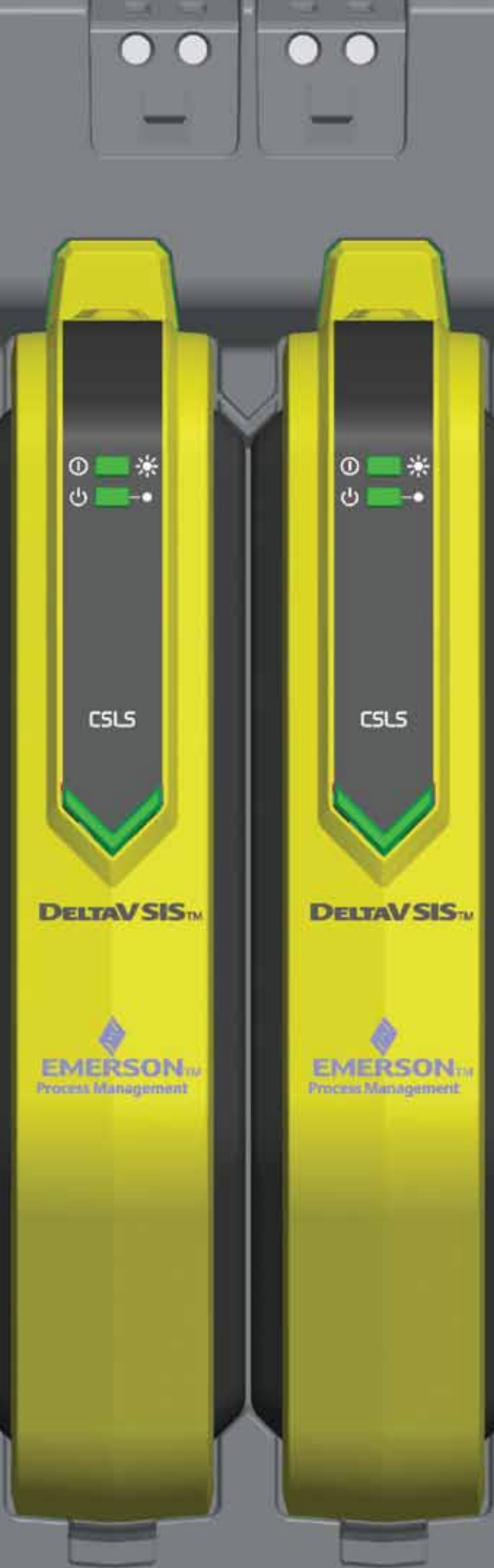
Reduced expertise and experience is creating a challenging environment for safe and optimised operation of process plants. Chief Strategic Officer Peter Zornio explains how innovations from Emerson Process Management can help by simplifying safety system project engineering, improving operational integrity of the safety system and better protecting critical machinery during start-up and operations.

The challenges process manufacturers face are complicated by a loss of in-house expertise as experienced engineers retire and increasing emphasis is placed on producing in emerging markets or far-flung locations where attracting skilled personnel is difficult. Emerson has responded by reducing the hardware and design engineering necessary to start up a manufacturing process quickly and successfully, introducing rotational equipment protection technology and providing enhanced final element diagnostics and reliability.

Emerson has launched three technologies that can help reduce the complexity of process manufacturing safety. Included in this initiative are DeltaV SIS™ logic solver with TÜV-approved CHARM I/O technology, TÜV-certified CSI 6300 Digital Overspeed Protection System, and the DVC 6200 SIS TÜV-certified digital valve positioner. These innovations represent another step in Emerson's continuing efforts to enhance end-user's safety performance, including its total-loop approach to safety instrumented systems.

Emerson has transformed safety systems by combining the proven performance and reliability of the DeltaV™ Safety Instrumented System (SIS) with the installation flexibility and space savings of its Electronic Marshalling technology. This new SIS offering greatly simplifies design, installation, wiring and commissioning of SIS projects, while at the same time increasing capacity and reducing footprint. Based on Human Centered Design (HCD) principles, the new Logic Solver architecture uses Electronic Marshalling and CHARM technology to eliminate the need for conventional marshalling, which simplifies both installation and commissioning processes.

This new DeltaV SIS architecture addresses the project challenges we hear about from customers. They wanted the best of both worlds – DeltaV SIS characteristics of integrated but separate safety, compliance with IEC standards, and field device diagnostics, but with the capabilities they saw in our CHARM technology for process control. The result is a more flexible, easier-to-install, higher capacity system. Furthermore, the overall footprint requirements for the solution are far less than other safety systems in the market. The system can be implemented as a standalone SIS solution, natively integrated as part of a DeltaV installation, or connected to any DCS.



A logical step in helping customers tackle the complexity of designing, implementing and operating safety systems, CHARM technology greatly reduces the number of steps needed to successfully design, install and operate these solutions.

The CSI 6300 SIS protects rotating equipment, typically pumps, compressors, or turbines, from improper start-up or overspeed conditions. It detects the rotational speed of the equipment and acts to shut it down if the speed exceeds the safe operating limit. This prevents equipment damage or hazardous operations due to surging that can be caused by unplanned load swings, for example. The CSI 6300 also detects when a rotating device moves in the wrong direction, a condition that can occur particularly during start-up. This is the only product available today that fully meets the newest industry standards.

No process safety system would be complete without looking beyond the logic solver and taking into account the total safety loop including the field devices. The DVC6200 SIS valve positioner extends Emerson's field-proven Fisher® DVC digital valve controller technology into safety loop operation. The new module is fully TÜV certified for use in safety applications. The DVC6200 is equipped with on-board diagnostics that detect a high percentage of potential valve failures while the valve remains in operation. By performing a partial valve stroke test, the DVC6200 can determine if the valve is stuck open, has inadequate torque, is too slow, exhibits high friction, or has a broken shaft. Determining the health of the device on a periodic basis can permit maintenance of the final safety element in a prioritised and planned fashion.

www.emersonprocess.com/IM020

the **Wireless**



In a tradition of open standards development, the HART®

Communication Foundation and its 260-plus member companies enhanced the HART Communication Protocol to include wireless capability based on input garnered from end users across a broad spectrum of industries. The evolutionary *WirelessHART*® communication standard, built on the solid foundation of the HART Protocol, is achieving widespread global acceptance among end users and suppliers throughout the process automation industry.

In only a few short years, *WirelessHART* became the first (and only) international wireless communication standard for industrial process automation (IEC 62591Ed. 1.0, EN 62591). *WirelessHART* maintains all the interoperability characteristics of the HART Protocol and has proven its ability to fulfil users' requirements for simple, reliable and secure wireless communication in

thousands of process automation applications and installations worldwide.

Specifiers, purchasers and end-users of process automation equipment are sending a clear message to industry suppliers by purchasing and deploying HART and *WirelessHART* products and solutions in overwhelming numbers. Users describe the technology as: "very reliable," "easy to set up," "easy to configure" and "surprisingly forgiving – it even works when some of the recommended best practices are not followed."

Major automation manufacturers are responding by actively promoting *WirelessHART* communication and shipping *WirelessHART* products for process industry applications worldwide. A wide range of interoperable *WirelessHART* products and system solutions are available from ABB, Emerson, Endress+Hauser, MACTek, Pepperl+Fuchs, Phoenix Contact, R. Stahl, Siemens and others.

Enhancing the proven HART Protocol for wireless transmission of process measurements and intelligent diagnostics greatly shortened the time required for industry acceptance. *WirelessHART* by design provides the same familiar ease of use and complements the HART instrumentation already installed in users' plants. It's secure backward compatibility, interoperability and reliability make it easy for both users and suppliers to support wired and wireless devices connected to the same automation systems, operating side-by-side and using the same tools.

To process industry users, interoperability is much more than devices using the same communication protocol. Devices must fully integrate with the process automation system and share their data in the same way without the need for special drivers, converters and different system configurations. Devices should be configured, commissioned and diagnosed the same way using the same tools. And, all devices, regardless of supplier, must fully

state of HART

interoperate with the system. Devices using the *WirelessHART* communication standard meet all of these requirements.

The HART Communication Foundation employs a rigorous product registration process to verify the compliance and interoperability of HART-communicating devices. The HART Device Registration Programme provides a set of standardised test plans, test procedures and test tools to support members in the development, compliance testing and verification of HART-enabled devices. The test and registration programme applies to all HART devices (wired or wireless) to assure the interoperability and communication performance of products across all manufacturers.

Users are installing *WirelessHART* products in real-world applications and experiencing firsthand the technology's reliability and security. *WirelessHART* is being used in a variety of industry applications for new process measurements on rotating equipment, tank farms and hard-to-reach plant areas. The variety of applications will continue to grow as users more and more recognise the cost-efficient benefits of *WirelessHART* for process monitoring, control and asset management.

Users choose *WirelessHART* because it: is straight forward and easy to use in process industry applications; is compatible with existing systems; is the widely supported international standard (which forestalls obsolescence); leverages existing tools and skills; is easy to deploy; and provides robust, reliable and secure wireless communication.

www.hartcomm.org



identifying **PROBLEMS**



Barking Power Station is one of the largest independently-owned power plants in the UK. To remain competitive, power plants must continually increase availability and efficiency explains Ian MacDonald, Senior Control Systems Engineer, Barking Power. To achieve this, potential problems must be identified earlier. Wireless technology offers a cost-effective path to this goal.

Being capable of providing consistent levels of production when called upon is critical to maximising plant profitability. It is important to manage critical plant assets, identify potential problems and schedule required maintenance to prevent unexpected downtime and increase plant reliability. Steam loss from malfunctioning valves or failed steam traps is a particular area of concern. Large, single leaks will normally be easy to detect during operator rounds, but smaller leaks may go unidentified for 2-3 weeks and can potentially add up to four tonnes of steam lost per hour. We therefore want to identify these as early as possible.

Online acoustic transmitters provide the perfect solution. These non-intrusive devices use acoustic “listening” technology, combined with temperature measurement, to identify turbulent flow generated by failed steam traps or leaks. The difficulty with deploying these devices is that 100 steam traps and many more control valves are distributed right across the plant. Traditionally, adding a device has required supporting power and data cabling which in most cases is not available. Installing a new cable infrastructure is difficult, time-consuming and cost prohibitive. The solution lies in the availability of wireless acoustic transmitters from Emerson.



earlier

To improve identification of failed steam traps and problem valves, we installed 35 of Emerson's Rosemount® wireless acoustic transmitters. Should a steam trap fail or a small leak begin, an acoustic device transmits changes in sound and temperature which are configured to alert operators of a potential problem. The plant began gaining the benefits of the new devices immediately, as a leak from a high pressure super heater steam trap was identified that would have cost £1400 for every 24 hours of lost operation.

15 additional acoustic transmitters were installed to monitor other problematic areas, including vent valves that can stick during start-up and pressure relief valves that don't seat correctly. Previous manual monitoring was not only time-consuming but also failed to indicate when or why a release occurred, increasing the chances of a safety, regulatory, or environmental incident. The new wireless devices enable precise monitoring and alert operators when valves have opened for as little as a single second.

The wireless acoustic transmitters have also been installed to identify leaking boiler tubes. These leaks not only reduce performance but also waste large amounts of costly boiler feed water, which is demineralised and chemically treated to help

prevent corrosion. Data is fed into the plant's existing Emerson Ovation™ control system, where noise levels can be trended to identify gradual changes. Repairs can then be scheduled during normal off-times to maintain maximum plant availability and avoid forced downtime.

The mobility and flexibility of the battery powered wireless devices also allow us to run trials and move devices to different areas without having to lay temporary cables. As a result, we can spot early problems and improve response to malfunctioning equipment – enabling better planning and utilisation of maintenance resources. Improving process performance is all about understanding what is happening and being able to respond quickly. By having the opportunity to introduce additional measurements, we have all the information we need.

www.emersonprocess.com/IM021



Innovative technologies

Wireless device suitable for critical level control applications



Rosemount 2160

Vibrating fork switches provide overflow protection, high and low level alarms and empty pipe detection. To improve the suitability of its Smart Wireless vibrating fork liquid level for critical control applications, Emerson's Rosemount 2160 now offers faster update rates and advanced broadcasting functions. One second update rates extend the range of applications to include fast moving processes, such as those found in batch filling. Wireless network redundancy and robustness enable customers to confidently extend their use to critical monitoring and control applications.

For monitoring applications, a unique trending capability enables the collection of data samples for a specified device variable. This reduces the number of transmissions over the wireless network, optimising battery life. A new advanced broadcasting function ensures that changes in process value, frequency of the vibrating fork, battery voltage or temperature are transmitted immediately, thereby improving both safety and diagnostic capability.

www.emersonprocess.com/IM022

Enhanced pressure transmitters help reduce maintenance and increase productivity




Rosemount 3051C

Process companies continually strive to maximise operational control. Advanced instrumentation can help support this as well improving productivity and safety and reducing the total cost of ownership. Supporting these aims, Emerson has made significant enhancements to its family of Rosemount 3051 pressure products. This includes improved accuracy that allows operators to run plants closer to set levels – increasing product quality and throughput with more accurate control.

before they cause a loss of measurement. SIL2 certification extends the time between proof tests to five years – thereby avoiding extra shutdowns for safety testing. Selectable HART Revision capability delivers the latest HART features while ensuring seamless integration with any installed host, asset management system or configuration tool. To help inexperienced users the device has a simple three step activation, a user-friendly interface with straightforward menus and guided troubleshooting.

Power Advisory Diagnostics allows users to identify electrical loop issues

www.emersonprocess.com/IM023



Software generates more realistic reservoir models and increases recovery rates

Accurate predictive reservoir models that can realistically represent the underlying seismic data and offer a seamless route from seismic to simulation are central to efforts to improve oil & gas recovery. RMS 2012, the latest version of Emerson's reservoir modelling software incorporates completely integrated reservoir modelling workflow which includes seismic interpretation, reservoir simulation, reservoir behaviour predictions, and uncertainty management. RMS 2012 comes with new seismic inversion, seismic attributes, and field planning capabilities to help operators generate more accurate and realistic reservoir models and increase recovery rates.


www.emersonprocess.com/IM024



Flue gas analyser on-line diagnostics help reduce calibration requirements

As compliance demands for flue gas analysis become greater, instruments need to be more accurate and easier-to-use. Emerson's Rosemount Analytical Model 6888 in situ oxygen analyser offers a unique on-line diagnostic feature that determines when the highly application-dependent calibration is required. The device can also trigger a fully automatic calibration by sequencing solenoids to introduce calibration gases to the sensing cell. Calibrations can be conducted on-line while the furnace is in operation. This greatly reduces unnecessary calibrations, technician time and resources.

www.emersonprocess.com/IM025



EtherNet/IP Module connects Coriolis flowmeters in hazardous areas

Using open standard networking to access flow, density, temperature and many other parameters enables increased productivity and fast process insight. To support the growing number of installed EtherNet/IP networks, Emerson has introduced an EtherNet/IP Module that is compatible with all Micro Motion® Coriolis flowmeters and suitable for use in hazardous areas. A web browser provides access to remote diagnostics including Smart Meter Verification, which determines meter performance without stopping the process or interrupting the flow.

www.emersonprocess.com/IM027



Advanced shaft animation and online collaboration improves reliability analysis

Through analysis of critical machinery health information, equipment issues can be identified and resolved before damage and process interruptions occur. Version 5.5 of Emerson's AMS Suite: Machinery Health Manager aids maintenance in diagnostic and root cause analysis by delivering advanced plot capabilities, including shaft animation and audio waveform, interactive reporting, and on-line collaboration. This provides early identification of typically difficult to diagnose issues. AMS Machinery Manager can now easily integrate thermal images from both Flir and Fluke infrared cameras.

www.emersonprocess.com/IM026

Further information

Emerson Process Management is always looking for new and innovative ways to enable customers to connect with them. These include local country websites, the award winning Emerson Process Experts blog – which includes an automatic translation tool, social media pages and twitter.

Websites

Please visit our website where you will be redirected automatically to the country/language version as indicated by your Windows settings.

www.EmersonProcess.co.uk

Blogs

Emerson Process Experts

Connecting with the people behind the technologies and expertise. Site equipped with automatic translation.

www.EmersonProcessxperts.com

DeltaV News

DeltaV - Emerson's digital automation system for process control.

news.easydeltav.com

Modelling and Control

The dynamic world of process control, site equipped with automatic translation.

www.modelingandcontrol.com

The Emerson Global Life Sciences Blog

Timely, targeted and relevant information for professionals in the life sciences industry.

www.emersonlifesciences.blogspot.com

Analytic Expert

Discussing the application of liquid and gas analysers.

www.analyticexpert.com

Micro Motion On-line Community

On-line resource for Coriolis flow & density measurement. Contains a blog and forums.

<http://community.micromotion.com>

Community

Emerson Exchange 365 is the global peer-to-peer on-line Emerson Users Exchange Community with a built-in translation facility.

www.EmersonExchange365.org

LinkedIn

Enter the following group names into the search bar in LinkedIn

DeltaV Digital Automation System

DeltaV SIS Process Safety System

Emerson Global User Exchange

Syncade suite

Micro Motion



Emerson Process Experts

www.facebook.com/EmersonProcessXperts

Micro Motion

www.facebook.com/micromotion

DeltaV

www.EmersonProcess.com/DeltaVFacebook

Emerson Process Management

www.facebook.com/EmersonProcessManagement

Rosemount Process Level

www.EmersonProcess.com/ProcessLevelFacebook



www.youtube.com/user/EmersonPlantWeb

www.youtube.com/user/DeltaVsystem

www.youtube.com/MicroMotionVideos

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