

EXCHANGING IDEAS. CREATING SOLUTIONS.

HIGHLIGHTS FROM THE 2011
EMERSON GLOBAL USERS EXCHANGE



A SPECIAL REPORT FROM THE EDITORS OF

CONTROL

EMERSON TAKES AIM AT INDUSTRIAL ENERGY USE

There's talking about green. And then there's living green. But when you want to move from one to the other, that's when you find out who your real friends are. To help its customers worldwide get the most out of every single BTU they use or produce, Emerson Process Management unveiled its new Smart Energy Initiative today at the 2011 Emerson Global Users Exchange in Nashville.

The Smart Energy Initiative is a global program designed to combine Emerson's industrial energy expertise with advanced energy management technologies to enable customers to leverage more renewable fuels, cut energy costs and reduce emissions. With energy comprising 30% or more of a typical facility's overall operating costs—combined with higher prices for fossil fuels and new global emissions mandates—industrial customers are increasingly looking to waste fuels, biomass and other renewable sources as a solution.

Emerson's new Industrial Energy Group will focus on modernizing and improving the performance of

powerhouses, the onsite utilities that provide steam and electricity to power industrial operations, while also improving how the manufacturing process consumes energy. "With industrial manufacturers consuming an estimated 50% of the world's energy, combined with rising fossil fuel prices and global mandates for reduced emissions, our customers need more than incremental efficiencies in energy management," said Steve Sonnenberg, president of Emerson Process Management. "With our Smart Energy Initiative, Emerson is introducing a fundamentally new platform that can change energy economics globally."

The heart of Emerson's integrated technology platform is its "True BTU" technology, a patent-pending innovation for calculating the actual BTU values of fuel sources, which makes reliable energy production predictable and repeatable. "Our True BTU Combustion Control platform reinvents the current model of combustion management, which has been around since the 1920s and



"Improved controls are helping us achieve our vision of becoming energy self-sufficient." Tata Steel's Andrew Rees explained how the company plans to reduce powerhouse energy consumption by 3% to 5% through better monitoring and optimization of combustion processes.

is still in practice today,” said Chip Rennie, director of the Industrial Energy Group. “This brings about nothing short of a reinvention of combustion models, which will make the prevalent use of low-cost fuels like biomass achievable and sustainable.”

In fact, Tata Steel’s plant in Port Talbot, Wales, U.K., recently upgraded the controls on its largest steam boiler using Emerson’s new energy-management principles, technologies and services. However, unlike most run-of-the-mill boiler upgrades, these new principles and controls are enabling Tata to increase its energy efficiency, maximize use of waste fuels, cut emissions and reduce its former reliance on purchased fuels.

“The boiler upgrades are helping us make better use of ‘indigenous’ waste fuels, such as blast furnace gas, BOS gas and coke oven gas, which are byproducts of our manufacturing process,” said Andrew Rees, manager of Tata Steel’s upgrade project. “The improved controls are part of a comprehensive energy management project that’s expected to reduce powerhouse energy consumption by 3% to 5% and help us achieve our vision of becoming energy self-sufficient.” ■

ALTERNATIVE ENERGY FOCUS OF NEW EMERSON TEAM

Did you know that Emerson Process Management has a team of experts dedicated to Alternative Energy? It focuses primarily on three sectors, the first being conversion of biomass into chemicals or advanced biofuels. It also looks at what it calls “X to X,” which can range from coal to chemicals to gas to liquids. The common element of X to X conversion is a gasifier. Finally, it looks at renewable power which includes wind, solar, biomass and geothermal.

Whether it’s looking at ways to help an advanced biofuels developer mitigate project risk or working with an X-to-X operator to extend gasifier run lengths, the Emerson Alternative Energy team can provide valuable industry insight to help you achieve your goals.

If you’d like to learn more, please check out the team’s new website. It’s brand new and the team is still working on a few things, but team members would love to hear what you think.

www.emersonprocess.com/AlternativeEnergy

ROSEMOUNT MARKS 10 YEARS FOR 3051S SERIES PLATFORM

More than just a new pressure transmitter launch, the 2001 introduction of the 3051S Series by Emerson's Rosemount division represented a first in its field. "Our aspiration was to develop a scalable field instrument architecture that could deliver significantly more value for our customers," says Rosemount Vice President, Worldwide-Pressure, Scott Nelson.

Ten years on, the ability to continue to innovate on that architecture is apparent in its latest award-winning iteration, the 3051S ERS. For electronic remote sensors, the ERS model effectively eliminates problematic capillaries and wet and dry legs often used in differential pressure (DP) level and flow measurement applications. But the real technical breakthrough here is the ability to power the two pressure sensors (for the top and bottom of the tank), as well as their supervisory electronics—all on a single 4-20mA loop. This allows the 3051S ERS to function as a drop-in replacement in decades-old DP cell installations. One chemical company beta-tester installed a 3051S ERS System on a 30-ft (9 m) outdoor tank and realized over two years of

maintenance-free operation and better level control.

Also key to the initial and ongoing success of the 3051S is its "super module" design, which packs all of the instrument's electronics into a single, hermetically sealed stainless steel module. "We tried to design out many of the installation, commissioning and operational issues that end users struggle with," Nelson adds.

The 3051S also was the first scalable WirelessHART (IEC 62591) pressure transmitter introduced to the marketplace. WirelessHART allows new measurement points to be added without the hassle and cost of wiring, which reduces deployment time by 75%. Proven success has occurred in applications such as greenhouse gas emission monitoring, optimization of compressors and heat exchangers, and monitoring steam injection flow for enhanced recovery oil fields across the globe. "It took only three hours to install all the instruments, configure and establish the network IP address, and make the Ethernet connection to the control room," says Paul Kinne, head operator at Chevron, "We have eliminated the



FIRST EMERSON EXCHANGE IN EUROPE ON DECK FOR MAY 2012

With the information-packed week of learning, sharing and networking opportunities that the Emerson Global Users Exchange represents, one might well ask: What more could one possibly want? Well, for some Exchange attendees, no jet lag or pricey intercontinental airfare would be a good start. And for those who live in Europe and the Middle East, Emerson Exchange just got a whole lot closer.

Scheduled for May 29-31, 2012, in Düsseldorf, Germany, the first Emerson Exchange outside the United States will take place at the Hotel Maritim, near Düsseldorf International Airport (DUS), which provides direct flights to many European cities.

The format for this slightly abbreviated three-day event closely follows the established Emerson Global Users Exchange model, with workshops, presentations, industry forums and technology exhibits. "There's been much enthusiasm among users, and we already have recruited 12 user board members to help guide the event," says Marleen Kuipers, director of marketing for Emerson Process Management in Europe.

This week's Emerson Global Users Exchange in Nashville formally kicks off the "call for papers" period for the Düsseldorf event. Importantly, users who have a presentation accepted will have their Emerson Exchange registration fee waived. For more information on the event and how to submit a presentation for consideration, visit the Emerson Global Users Exchange website at EmersonExchange.org.

excess steam usage and now have a reliable steam injection measurement at eight stations."

Advanced diagnostics, another 3051S innovation, allows users to analyze changing process conditions and take corrective action for abnormal situations, such as plugged impulse lines or unstable furnace flames. At one ethylene plant, advanced diagnostics have allowed the company to detect abnormal process conditions and track equipment health 24 hours a day. "Peak production performance has improved with an estimated operational savings for the plant of \$20,000 to \$30,000 (USD) per day," says the team leader of company's instrumentation group.

More recent 3051S advanced diagnostics can monitor the integrity of the electrical loop, including detecting water in the housing, ground loop issues or an unstable power supply. "The loop integrity monitoring capability of the 3051S will help to increase the overall integrity of our safety system loops in the harsh and humid offshore environments," says Deon Rae, technology manager of process automation at Chevron.

The Rosemount 3051S MultiVariable Transmitter provides differential pressure, static pressure and process temperature measurements along with advanced compensation techniques to provide fully compensated mass and energy flow outputs. The 3051SMV provides full compensation of over 25 different parameters to achieve a 5x improvement in flow performance compared to an uncompensated differential pressure flow measurement. By using 3051SMV technology, a natural gas distributor saved \$80,000 in installation and calibration costs when upgrading a storage facility to improve operations.

"The 3051S raises the bar significantly regarding the expectation for pressure, DP flow and DP level instrumentation," adds Mark Schumacher, president of Rosemount Pressure. "The level of security, reliability, performance and features brought forth in the 3051S allows our customers to push their processes harder, with more time between maintenance and outages. Our customers are safer and more profitable. With our continued focus on research and development, we are committed to ensuring our customers' future success." ■

EXCHANGE EXTENDS BOUNDARIES WITH NEW COMMUNITY WEBSITE

“I gain a lot of information and knowledge at the Emerson Exchange—but it’s only one week, and we can’t bring everyone who should go every year,” says B. C. Spear, instrumentation and control technical authority at BP’s Whiting, Ind., refinery. “But what if that one week could continue all year long?”

So when Emerson approached the Exchange board of directors, where Spear has a seat, with the idea of a community website to facilitate information exchange online, he was in. “It rang out with what we wanted to see—a one-stop place to go to for technical material; social in the sense of a technical resource exchange.”

The idea behind Emerson Exchange 365 is to build on the experience of the physical event itself—the peer-to-peer sharing of things that work—explains Jim Cahill, who heads social media efforts for Emerson Process Management. “Secondarily, it’s about connecting with Emerson experts and developers, but it’s first and foremost about bringing our customers together with each other,” Cahill says.

Emerson Exchange 365 is built on the same Telligent platform used by the likes of Dell and Texas Instruments to facilitate their customer networks. It consists of familiar social media functionality, such as forums and blogs, with subject matter grouped multi-dimensionally by industry and by technology category, much like the tracks at the Emerson Exchange event.

There is also a “World” track intended to incubate special interest groups (SIGs) based on language, geography or other special interests. “The hope is that as these SIGs grow, they may spawn entire language and regional-based communities and new tracks for the existing site,” says Cahill, who is looking for community managers who would take an active role in these groups.

Of course, Emerson Exchange 365 isn’t the company’s first venture into social media community, and appropriate content from some of the existing blogs such as the DeltaV technology team’s ModelingAndControl.com and Cahill’s Emerson Process Experts will be mirrored via feeds on Emerson Exchange 365. ■



GETTING STARTED WITH EMERSON EXCHANGE 365

1. Visit Community.EmersonExchange.org
2. Click “Join” in the upper right corner and, when prompted, create a user name and password. (Or log in with one click using your existing Twitter or Facebook credentials; the system will even import your avatar.)
3. Reply to Jim Cahill’s “Welcome” post on your new Emerson Exchange 365 home page with a brief introduction of yourself and what you hope to gain from the community.
4. Copy and paste your reply into the bio section of your profile.
5. Find an industry or product technology track (lowest level of the track hierarchy) and join by clicking on the “Join +” icon in the upper right.
6. Then ask a question, share your expertise and connect with your peers... and most of all, have fun!

EMERSON BUILDING TRUST, INVESTING IN TECHNOLOGY

Steve Sonnenberg, business leader for Emerson Process Management, put forward strong relationships built on trust, together with industry-leading technology, as key to the continued mutual success of the company and its customers.

“We want to earn your trust and become a ‘listening organization,’” Sonnenberg said to a record crowd of some 2,850 attendees at the 2011 Emerson Global Users Exchange this week in Nashville. And to help build that trust, Emerson is investing in its people around the globe. “Double-digit growth in all world regions has allowed us to make those investments everywhere.”

Indeed, the more than 4,000 people hired by Emerson Process Management in the past year include some 1,800 in Asia Pacific, 200 in the Middle East and Africa, 350 in Latin America and more than 1,000 in North America. “We weren’t even able to fill all the open positions,” Sonnenberg said, “because we refuse to let you down by relaxing our standards. There just aren’t enough technically trained people to fill

all the jobs in this industry. But we will never compromise on talent. We believe that our talent is a key differentiator.”

The company also has invested in acquisitions and in new technologies, Sonnenberg said.

Recent acquisitions include Canadian gas detection and safety system supplier Net Safety. New products include down-hole, multiphase flowmeters and wireless annular monitoring systems from Roxar and the extension of Emerson’s CHARMs input/output platform to provide single-channel intrinsic safety.

Sonnenberg also discussed the company’s renewed focus and commitment to helping its customers save energy and reduce emissions through efforts big and small—from advanced control strategies to the new Rosemount 784 wireless monitor for detecting steam trap leakage. (See related stories.)

“We are not shy about investing in good times and bad,” Sonnenberg said. “We have made lots of investments in technology to serve you.” ■



“I am very optimistic about the economy.” Emerson’s Steve Sonnenberg is bullish on the company’s global outlook. The company closed fiscal 2011 with \$7.3 billion in orders, with all world regions contributing double-digit growth.

EMERSON 'CHARMS' HAZARDOUS AREAS

Building on its innovative electronic marshalling and single-channel characterization module (CHARM) technology, this week at the Emerson Global Users Exchange, Emerson Process Management is showing its latest offering, intrinsically safe (IS) CHARMs. Electronic marshalling with CHARMs is a key component of Emerson's "I/O on Demand" strategy, which provides solutions for all types of I/O interconnection—point-to-point, bussed and wireless.

DeltaV electronic marshalling is designed to deliver a new level of control system I/O performance with unprecedented flexibility and ease of use. The addition of IS CHARMs provides significant savings in the system design, installation cost and ease of maintenance expected with electronic marshalling, with the added intrinsically safe circuitry for field wiring into hazardous areas, including Zone 1, Zone 0 or Class 1, Div1.

I/O in hazardous areas traditionally requires explosion-proof mounting or isolation barriers. These approaches are costly, require space for additional barrier and termination cabinets, and need ongoing maintenance to ensure that safety requirements continue to be met. IS CHARMs deliver a reduced footprint and eliminate the need for separate barriers and the associated inter-cabinet wiring. A smaller footprint together with fewer connections improves the reliability of the installation and delivers significant cost savings.

The DeltaV CHARM I/O Card (CIOC) supports both conventional and IS CHARMs, providing unprecedented

flexibility in control system I/O topology. I/O can be added anywhere it is needed using standard Ethernet infrastructure hardware. Each I/O channel has a dedicated CHARM that provides both signal characterization and galvanic isolation for intrinsically safe applications. IS barriers are integrated inside the CHARM to provide single-channel fault isolation, as well as electrical isolation and energy-limiting circuitry that meets IEC Ex ia ratings. IS CHARM's signal types include IS AI 4-20 mA HART, IS AO 4-20 mA HART, IS DI Namur and IS DO 24 VDC.

"Electronic marshalling allows process manufacturers to shorten project schedules, accommodate late project changes, eliminate equipment and cabinets, and dramatically simplify the I/O and marshalling design process," says Peter Zornio, Emerson Process Management's chief strategic officer. "With the addition of IS CHARMs, we bring that flexibility and savings to some of the most challenging process environments where, arguably, flexibility and reliability are needed most."

Electronic marshalling can eliminate two-thirds of the wiring and connections needed in conventional marshalling cabinets. Single-channel integrity improves plant uptime and makes projects simpler and easier to engineer and implement. The CHARMs technology greatly increases flexibility in assigning I/O types, whether for late project changes or during start-up, operation or temporary installations. Similarly, it adds flexibility in deciding the best location for I/O—whether in a rack room, remote locations, hazardous areas or harsh environments. ■



The DeltaV CHARM I/O Card (CIOC) supports both conventional and intrinsically safe CHARMs, providing unprecedented flexibility in control system I/O topology.

SHUT YOUR TRAP: WIRELESS SENSOR IDS STEAM LEAKS

At a time when energy makes up an increasing percentage of a plant's costs—typically 30% and rising—the last thing you want to do is throw that energy out the window. Industrial plants spend a significant amount of money on steam production, but leaks in the steam traps are akin to running your furnace with the windows open; some 20% of the steam leaving the boiler can be lost because of failing steam traps.

This week at the Emerson Global Users Exchange in Nashville, Emerson Process Management introduced the Rosemount 708 wireless acoustic transmitter as part of its Smart Energy Initiative. It helps processing plants significantly reduce energy costs and environmental impact by combining temperature measurement with acoustic “listening” that provides visibility into the state of steam traps and pressure relief valves.

Darren Goodlin calls it his “bionic ear,” enabling him to overcome the challenges of human inspection. He is manager of inline instrumentation for Anheuser Busch, whose St. Louis brewery was originally built in the late 1800s. Just one 3-mm equivalent leak can waste \$16,000 a year, Goodlin said, and the St. Louis plant

has more than 1,000 steam traps, each of which requires manual inspection. Resources aren't always available to make inspections as often as previously, and many times leaks go undetected, he said.

“Murphy is at large in your facility,” he added, alluding to one of the problems with all-manual inspection.

The Rosemount 708 provides accurate measurement and constant visibility to steam traps without the effort of a manual inspection. This could reduce fuel costs by 10% to 20% annually. The transmitter also improves equipment performance, Goodlin said. “If you're not getting a consistent flow and quality of steam to your system, the whole thermodynamic heat transfer becomes variable.”

Pressure relief valves are another critical component of a plant. Monitored manually for releases, the inspections do not indicate when or why a release occurred. The Rosemount 708 wireless acoustic transmitter alerts operators when a valve has opened in as little as a second. The time-stamped alerts can be compared against process conditions or environmental reporting to help identify the root cause of a release so that preventive measures can be taken. ■



“Murphy is at large in your facility.” Darren Goodlin, manager of inline instrumentation at Anheuser Busch, explains the downfall of human inspection of steam traps. Emerson's Rosemount 708 provides constant visibility without manual inspection.

USERS SPARKED BY SEARCH FOR UNCONVENTIONAL GAS

Oil and gas people always like a good challenge. So even though some fuel sources may be getting harder to find, it seems as though many extractors, refiners and transporters are actually inspired and energized by the increasing hurdles they face these days.

Such was the mood at the Oil and Gas Industry Forum on the first day of the Emerson Global Users Exchange this week in Nashville, Tenn. The panel session was filled to standing room only.

“Interest in unconventional natural gas is increasing rapidly, and this is raising a lot of new and important questions, such as which countries are coming forward as new sources,” said David Newman, director of oil and gas production for Emerson Process Management. “There are also a lot of minor independent companies coming in, and many national oil companies are getting involved as well.”

Likewise, many producers are shifting their corporate focus, learning new skills and adopting new technologies to secure the resources they need for their own customers. For example, Misty Isaacs, liquids coordinator at Chesapeake Operations in Oklahoma City, Okla., reported that her company is moving new pipelines into shale oil areas, and it’s also applying new metering technologies in new settings. It’s laboring to install a new data-handling system, implement best practices, train staff and deploy new meter design standards.

“The challenge of shale oil is that it’s basically coming out of the ground faster than we can get pipes in place,” Isaacs said. “We’re trucking a lot out of our leased areas, but it’s also difficult to schedule trucks and make sure they’ll be available. So we’re relying a lot more on Rosemount radar gauges to check tanks levels,

which means our drivers don’t have to suit up to do it. Chesapeake is traditionally a gas company, but now we’re also trying to view ourselves as an oil and gas company. Our goal is to increase production to 150,000 barrels of liquid per day by the end of the year.”

Of course, ExxonMobil operates on a slightly larger scale than Chesapeake, but it faces many of the same challenges as it also seeks to find and secure unconventional oil and gas sources, said Alex Guiscardo, ExxonMobil’s global facilities engineering manager.

“Shale gas was historically poorly understood and was almost a non-entity at one time, but now it accounts for almost a third of the total natural gas reserves in North America,” Guiscardo said. “In the past, we weren’t watching closely what was going on with unconventional natural gas, but we are now, and we’ve learned rapidly about it.” Thanks to three recent acquisitions and its own recent efforts, he added that ExxonMobil is now the largest natural gas producer in the United States.

To succeed with unconventional fuels on a long-term basis, ExxonMobil is using an especially responsible operating philosophy, Guiscardo reported. “When we produce unconventional oil and gas, we’re trying to be as safe, reliable and affordable as possible, as well as meet the environmental expectation of the residents around these resources,” he said. “We’re going into a lot of places now where people aren’t used to seeing us. In addition, because fracking and groundwater are also in the news a lot, Exxon also believes that we should publicly disclose the content of our fracking fluids. It’s 99% water and sand and then a few chemicals, but we feel that education and sharing with the public is the right thing to do, especially because this resource can help the United States become energy-independent.” ■



“The challenge of shale oil is that it’s basically coming out of the ground faster than we can get pipes in place.” Misty Isaacs, liquids coordinator at Chesapeake Operations, explains why her company relies more on Rosemount radar gauges to check tanks levels.

'NICE BIKE': SCHARENbroich ENCOURAGES NEW CONNECTIONS

There are certain companies in this world that understand how to create loyal customers. Whether they make coveted motorcycles or simple cardboard boxes, they understand that everybody wants to feel like they belong to a group; they want to be acknowledged and honored, and they want to feel connected.

Mark Scharenbroich took the stage Monday as a motivational speaker keynoting at this week's Emerson Global Users Exchange in Nashville. He summed up the way people want to be made to feel they belong with two words: "Nice bike."

It refers to the two words that every owner of a Harley-Davidson motorcycle wants to hear. And it also makes reference to a company that understands how to connect with its customers.

When Harley-Davidson celebrated its 100th anniversary in Milwaukee, Scharenbroich found himself there by chance, in a rental car, surrounded by leather-clad, tattooed, bandana-wearing Harley riders. Although he had never before dreamed of owning a motorcycle, Scharenbroich said, "That day, I wanted a Harley. I wanted to be a part of that group."

Everyone needs to feel like they belong, Scharenbroich said. "When we don't belong,

we're on the outside looking in." To get that feeling of belonging, we—not only as companies, but also as individuals—need to acknowledge, honor and make meaningful connections.

To acknowledge means to ask questions, but also to listen for the answers. Scharenbroich quoted Barbara Jordan, the first Southern, African-American woman elected to the U.S. House of Representatives: "It's more important to be interested than interesting."

Scharenbroich shared several stories of the people in his life who showed a sense of passion in how they served others; the way they "nice biked" those around them. He mentioned Julia Child and her passion for cooking that brought in viewers. He talked of shop teacher Leroy Radovitch, who encouraged students to make their days great. And he spoke of Vietnam veterans, who said the hardest part of fighting was coming home to a country that didn't acknowledge them or honor them or try to connect with them or "nice bike" them in any way.

He encouraged Emerson Exchange attendees to make the most of their time at the conference by engaging in conversation with those around them, really listening to what they have to say and making meaningful connections. ■



"That day I wanted a Harley. I wanted to be part of that group." Keynoter Mark Scharenbroich explained the importance of making meaningful connections through acknowledgement and honor.

SMART WIRELESS SOLVING MORE PROBLEMS FOR MORE USERS

Emerson Process Management began its Smart Wireless program in 2006. Today the company has some 6,100 Smart Wireless networks installed, with about 580 million operational hours logged. The company has 17 wireless products available, with nine more planned for introduction in 2012. Some of the latest additions include the newest iteration of the Rosemount 3051S pressure transmitter and the Rosemount 708 wireless acoustic transmitter, both introduced this week at Emerson Global Users Exchange in Nashville.

These are all gateways to instrumentation, whether they're measuring temperature, pressure, level, flow, vibration or pH levels, says Bob Karschnia, vice president of wireless for Emerson Process Management. "It's really about giving our customers the tools they need to solve their problems," he says.

The technology is particularly popular surrounding energy use—helping plants to operate more effectively to reduce energy consumption, to operate more efficiently and safely, and to allow customers to reduce the risk of implementing projects, Karschnia says. "Wireless gives you the ability to optimize systems; it gives the advantages that customers need to solve these key challenges."

An example of the effectiveness of wireless

technology takes place in gas and oil fields, where wellheads, flow lines and separation areas have often relied on wired approaches, requiring significant wiring, trenching, conduit runs and cable trays. "Today they go out and get a truck moving around, and it will cut wires," Karschnia says. "The system will go down, and it can take several days to get it back online." Wireless instrumentation can be implemented more quickly, and there are no wires to break, he adds.

Emerson has a complete portfolio to operate a wellhead wirelessly, Karschnia says, including such devices as on/off valve controllers, corrosion/erosion transmitters and RTU solutions. A new wireless acoustic transmitter solution also can show significant savings in petrochemical plants, monitoring steam trap leaks or monitoring pressure relief valves.

Wireless accounts for only about 4% of Emerson's instrumentation points sold today, but that is ahead of plan and growing rapidly, Karschnia says. And though not at a stage where full details can be discussed, greenfield projects are being developed that include 20% or more of all I/O content in wireless form. An offshore barge platform that Emerson has been working on is completely wireless. "We're starting to see more and more of that," Karschnia adds. ■



"It's really about giving our customers the tools they need to solve problems." Emerson's Bob Karschnia updated a media briefing at Emerson Exchange on the growing application of wireless across industry.

HOW TO JUSTIFY PREDICTIVE MAINTENANCE INVESTMENTS

Some jobs are difficult, but others are close to impossible.

For instance, running any control and automation application reliably in the process industries can be a challenge. However, the insurmountable problem often is convincing managers to accept recommendations for needed reliability equipment, according to Doug White, director of refining industry solutions and senior principal consultant in Emerson Process Management's Process Systems and Solutions division.

To give control engineers the ammunition they need for justifying reliability improvements, White presented "Reliability Improvements Through Predictive Maintenance: An Economic Analysis" this week at the Emerson Global Users Exchange in Nashville.

White reported that maintenance costs are often low relative to others that make up the typical total cost of goods sold. "Reducing routine maintenance costs is often not enough to justify reliability investments," he said. "Reducing unscheduled maintenance, while maintaining reliability, is always a target."

As a result, White explained that efforts to justify reliability improvements must show how those improvements impact four operational goals, including:

- The safety goal of zero serious incidents by minimizing manpower in hazardous areas and fully automating remote start-up/shutdown switching;
- The sustainability goal of zero reportable emission events by minimizing energy use, emissions and waste;

- The reliability goal of zero unscheduled downtime by anticipating potential equipment failures; and

- The optimization goal of zero lost profit opportunities by using an integrated, real-time and repeatable decision loop to plan, schedule, execute and measure performance. This loop employs collaborative, data-driven analysis and decisions, as well as explicit evaluations of uncertainties and risk.

Next, reliability advocates need to estimate the percent of time that their plant is at maximum production. This is done by multiplying the maximum sustainable unit production rate at 100% by unit availability to get the actual maximum production rate (AMPR). "The most important question is, 'Is there a market for our increased production?' People often forget to consider this," explained White. "But if there isn't a market for it, then there's no benefit in increasing production."

In addition, White said that reliability efforts often call for implementing automation. This may include using predictive diagnostics tools, such as enhanced field instrument diagnostics, and increasing measurements of process equipment combined with performance analysis. Automation can also be used to improve operations and maintenance visibility into equipment status, performance and alerts. "However, instead of using automation to increase reliability and throughput, some managers decide to install spare or oversized equipment to make up for lost production," said White. "This is what's competing with automation for funding." ■



"Top performers have both higher availability and lower costs." Emerson's Doug White showed how investments in predictive maintenance can pay off on the bottom line.

ELECTRONIC MARSHALLING SLASHES COSTS FOR SULFURIC ACID MAKER

If you had to build a new process plant, you might dream about needing 50% less wiring and installation labor, but then you'd likely wake up. Well, some users are now living that dream, thanks to Emerson Process Management's electronic marshalling technology. Launched two years ago, this new approach to control system I/O, which features single-channel, highly flexible characterization modules (CHARMs), is now proving its potential in a growing number of real-world applications.

For instance, Southern States Chemical built and opened its new sulfuric acid plant in Wilmington, N.C., just one year ago, and CHARMs dramatically simplified and streamlined the entire project, according to Bryan Beyer, Southern's acid operations manager. He described Southern's efforts during a Tuesday press briefing at the Emerson Global Users Exchange this week in Nashville.

Though as the largest East Coast supplier of sulfuric acid, it runs other facilities, Southern needed the new plant to meet growing demand for its product. Beyer reports that sulfuric acid is the most widely traded chemical commodity in the world because practically every process application from pulp and paper to chemical production to brew-

ing beer uses large amounts of it. The compact 120-ft x 100-ft plant was also needed to supply reliable, high-pressure steam to Invista's specialty chemical plant next door.

Sulfuric acid is made from water, sulfur and air in a series of oxidation and absorption steps. Measured variables include a range of temperatures, pressures, flow rates and conductivities. "Temperature control of the SO₂ converters is especially critical because they use a catalyst and have to make several passes," explained Beyer. "So we decided to install 10 CHARMs cabinets in areas with the highest I/O concentration."

Engineering and integration firms, Control Southern and R.F. Mason, helped Southern States design and integrate the new plant.

In the end, Beyer says his company saved about 50% on wiring and instrumentation installation labor thanks to electronic marshalling. For example, instead of having to bring I/O signals 200 feet back to its control room, many could simply be tied into the existing Ethernet backbone in just a couple of hours. "We were even able to secure some digital inputs, install a horn in the control room and have a whole-plant evacuation system for just \$2,000," added Beyer.

To get CHARMS and the rest of its new



For Southern States' Bryan Beyer, improved I/O flexibility and "50% less wiring and installation labor" headlined the benefits of using Emerson's electronic marshalling technology in the construction of the company's newest sulfuric acid plant.

process control system up and running, Beyer adds that his team had to cope with Southern's long tradition of mostly manual control. "The company used very little automation before, so the operators really weren't used to performing control functions in a control room," he added. "However, after about two weeks of training, they found it was pretty easy to understand."

In addition, Emerson's chief strategic officer, Peter Zornio, announced that today, October 25, it's adding intrinsically safe (IS) CHARMs to the company's electronic marshalling offering. By eliminating the separate wiring and cabinet space needed for stand-alone IS barriers, IS CHARMs are expected to deliver even greater savings in system design, installation cost and ease of maintenance for hazardous environments.

"Electronic marshalling allows process manufacturers to shorten project schedules, accommodate late project changes, eliminate equipment and cabinets, and dramatically simplify the I/O and marshalling design process," explained Zornio. "With the addition of IS CHARMs, we're bringing this same flexibility and savings to some of the most challenging process environments, in which flexibility and reliability are needed most."

Finally, Zornio revealed that Emerson also is working on a safety instrumented system (SIS) version of CHARMs. He reported that a prototype is even being demonstrated on the event's exhibit floor this week, but so far no release schedule has been announced. ■

WIRELESS CONTROLLER AUTOMATES MANUAL VALVES, HELPS PREVENT ACCIDENTS

Each year, 90% of plants report problems with manual valves in the wrong position that result in environmental, safety or lost production incidents. The source of the problem is human error; for the typical plant, ensuring thousands of manual valves are always in the right position creates opportunities for mistakes. On average, only 1% to 2% of manual valves are automated each year due to costs of wiring and lack of spare project time.



The Fisher 4320 Wireless On/Off Controller uses innovation to remove these barriers to automating manual valves. Embedded WirelessHART technology allows control systems to send wireless setpoints and receive wireless feedback. Zero-bleed pneumatic controls are ideal for open/close and natural gas applications. Magnetic arrays constantly monitor valve position and actuation timing without mechanical linkages to provide position feedback, as well as to detect whether a valve is stuck, degrading or has a broken stem. ■

NEW USER INTERFACE APPROACH HELPS SIMPLIFY THE DIGITAL FIELD

Industrial plants are growing continually larger and more intertwined. Unfortunately, there are fewer technically qualified people to deal with that complexity. “As baby boomers retire, a lot of the knowledge and experience that exists in those plants is getting ready to go out the door,” says Peter Zornio, chief strategic officer for Emerson Process Management. “It’s going to be a big issue as we go forward.”

To combat the issue, Emerson began investing six years ago in what it calls Human Centered Design (HCD). Whereas past product qualification involved such factors as quality and performance targets and code reviews, today that includes usability reviews as well. “We’re not putting out technology that’s going to be too complex for the average, less skilled person that’s coming into the industry,” Zornio says.

When Emerson instituted its usability guidelines, its user interface was held to the same standards. “The deal was we had to tell you exactly what’s going on,” says Dale Perry, Emerson smart-field consultant, “and we had to give you recommendations about what to do about it.” Instead of red dots alerting operators to a problem that they have to decode, interpret and find, the HCD interface tells them what the problem is and how they might fix it.

The interface has taken the inherent complexity of a Foundation fieldbus network, for example,

and really simplified it, Perry says. The user interface focuses on the task at hand, independent of the protocol, measurement or delivery method. “It all starts with a measurement,” Perry says. “How am I going to get that measurement? What’s the protocol that I’m going to use to get it?”

The easy way to go is with the HART protocol, which requires no special tools or training, Perry says. But depending on the application, it can be slow, prone to on-scale failures and can leave data stranded. Further, power constraints can limit functionality, Perry points out.

Foundation fieldbus, on the other hand, is designed to be a process LAN. It’s designed to pass data back and forth; it provides an unlimited number of variables; and it is an active protocol. But it’s complicated. It requires special tools like bus analyzers and oscilloscopes; you have to know where devices are located; considerable training is required; and device descriptors have no backward- or forward-compatibility.

The HCD user interface brings fieldbus and HART together in a simple way for users, enabling both functionality and simplicity, Perry says. It focuses on the task that needs to be done, providing a consistent graphical look and feel that is technology-independent. Built-in wizards replace the need for operators to know what the relevant variables are. “It’s the Google of user interfaces,” Perry says. “It’s very clean, but very, very useful.” ■



“The deal was we had to tell you exactly what’s going on, and we had to give you recommendations about what to do about it.” Emerson’s Dale Perry explains how the company applied Human Centered Design to its user interface to simplify protocol complexity.

COMPANIES BATTLE RECESSION FATIGUE WITH AMS SUITE APM

As the recession demonstrated its staying power through 2010, most companies suspended capital investments, jettisoned experienced personnel and cut way back on maintaining their equipment. But while many of their customers laid off and cut back, Emerson Process Management and Meridium continued to work together to expand interfaces and improve integration of Emerson's device, machinery and performance health monitoring systems.

Introduced a year ago as a result of the partnership that Emerson formed with Meridium in 2009, the AMS Suite APM asset performance monitoring system adds a key component to the PlantWeb digital plant architecture, enabling plant managers to quickly access integrated information from multiple data sources, view real-time analyses and reports of asset health and availability, and devise management strategies for reaching new levels of performance. It works with competitive platforms and legacy systems, as well as Emerson's DeltaV and other Emerson systems.

With Emerson's extensive installations of DCS, smart instruments and predictive technologies, "The amount of available information is exploding," says Bonz Hart, president and CEO, Meridium, "and it's great information, brought directly

into the systems without human intervention, for monitoring the health of equipment."

In the past, the need for wiring could inhibit installations, but now low-cost wireless technologies are making it easy to add sensors, connect them to a centralized system and get equipment health information.

The resulting real-time information is also dynamic. Instead of static studies of equipment condition sitting in binders on a shelf, condition data is constantly updated and available to other systems. Hart says, "It's letting us use a living asset strategy we couldn't achieve in the past."

AMS Suite APM breaks users out of the predictive maintenance cycle trap of simply responding to upcoming problems. It allows them to get to the next level, where they can identify bad-acting equipment in their applications and revise maintenance procedures that cause and perpetuate ongoing problems.

Over the past year, while Emerson has been enhancing AMS Suite APM, plants have been starting to feel the effects of cutting back on maintenance and releasing experienced plant professionals. "Customers have been bringing us more opportunities to solve maintenance challenges, better manage asset bases and drive

equipment performance," says Ron Martin, vice president and general manager of Emerson's Asset Optimization businesses. AMS Suite APM is acquiring condition data from a wider array of process sensors and predictive technologies such as vibration and lubrication analysis. "We're covering mechanical and electrical equipment including heat exchangers, motors, pumps and compressors, as well as process control equipment."

Plant maintenance and reliability managers are receiving more integrated, real-time information to determine that maintenance dollars are being spent in the most critical areas for the greatest business return. This extension to AMS Suite easily accesses the predictive information customers are using and combines this with CMMS/ERP data to deliver an integrated view. The result is that the islands of asset information from across the plant or the enterprise are integrated in a proven solution that helps them make the best decisions for improved asset performance and plant reliability.

Better decisions pay off in higher productivity, overall equipment effectiveness (OEE), reliability, energy efficiency, and safety of plant personnel, the surrounding community and the environment. ■

NAIL A SPEECH, LAUNCH A CAREER

Like King George VI, “Engineers are terrible presenters,” asserted Dave Beckmann to a packed room in Tuesday afternoon’s workshop, “Nail a Speech, Launch a Career,” at this week’s Emerson Global Users Exchange in Nashville. If you want to convince your boss to fund your project, your peers to admire your work, or a customer to buy your product, Beckmann, an active preacher and retired Emerson marketing expert, offered do’s, don’ts, and a sure-fire formula for an effective presentation.

Every good speech has three aspects: its elements, its construction and its delivery. And there should be three elements. First, start with an illustration that everyone can relate to. “Make it something simple and memorable that captivates us,” Beckmann says.

Then make three points. “Always three,” he says. “People are wired to remember three things.” They should introduce an antagonist—the adversity to be overcome, the problem to be solved. “For Apple, it’s the PC Guy. For Emerson today, perhaps it’s ‘complexity.’” The points should provide an answer to the antagonist, problem or dilemma, and they should make a call to action.

Finally, bring the presentation to a conclusion, usually by coming back to the opening scenario. “It’s a classic, all-time, sure-thing approach,” Beckmann says.

But a simple structure doesn’t mean preparing a presentation is quick and easy. “A speech is work,” Beckmann says. “Don’t think you can just gather some slides and throw it together.” He’s adamant that you write a script (15 hours), sketch the slides (five hours) and then build them (10 hours). “Every time you stand up and open your mouth, you’re being judged.” Don’t agree to make a speech if you don’t have time to do it right—a poor presentation will hurt your career more than a good one would help it. “Ask

yourself why you’re being asked to make the speech and write out that reason,” he says.

As you work on the presentation, consider seven elements:

1. Select a title that intrigues the audience and draws them in (like the title of this article).
2. Write a passion statement—one sentence that coalesces your presentation—to guide you, even though you might not say it.
3. Include the three key points.
4. Use illustrations: Tell a story for each point.
5. “Bring real stuff,” Beckmann says, “Something physical if you can. We are cursed by PowerPoints.”
6. Use testimonials to prove your points.
7. Make a call to action.

While you’re building your presentation, “Pay attention to attention span,” Beckmann says. “The average human being can’t concentrate for more than 10 minutes.” Use videos to re-engage them and illustrate your points. Keep slides simple and light on words.

When you’re delivering the presentation, be careful not to inject throwaways like “you know,” “uh” or “OK...” Listen to yourself or have others listen to you to be sure.

Can you read your speech? “Sure,” Beckmann says, “as long as you read it well.” Never one to leave things to chance, Steve Jobs read one of his most famous speeches, his address to Stanford University’s class of 2005.

Dress is not critical, said Beckmann in his khakis, striped shirt and argyle sweater-vest. But do consider the crowd, and if it’s conservative, “cover up your tattoos.” He ended, as you might expect, on his opening note: “If a speech could make a king and save a country, I guarantee it could launch your career.” ■



“Start with an illustration that is simple, memorable and captivates us.” Retired Emerson marketing honcho Dave Beckman offered his sure-fire approach to giving great presentations.

FIRESTONE PREDICTS FUTURE OF ENERGY SAVINGS

You know by now that steam conservation offers one of the most profitable opportunities to reduce plant energy consumption. But what if your process includes a set of fussy hexane purification columns? How are you going to get those distillation columns to use less steam without compromising quality or production rates?

At Firestone Polymers' Orange, Texas, facility, Production Superintendent Nikky Brown drew on the expertise of James Beall, Emerson principal process control expert, and the advanced process control intelligence embedded in DeltaV Predict model predictive control. In their crowded session at this week's Emerson Global Users Exchange, "APC Reduces Energy and Lowers Carbon Footprint in Firestone Polymers' Orange Facility," Brown and Beall described their journey.

The plant uses a mixture of butadiene and hexane as a reactor feed. Raw solvent and recovered solvent are purified in distillation columns, and a vent gas recovery system captures hydrocarbons from the vent gases returned from all areas of the plant.

A previous project in 2005 to convert the plant from pneumatic controls to DeltaV included upgrading the instrumentation and final control elements as needed. To reach the next level, Firestone installed advanced process control (APC) on the solvent recovery unit, drying column and vent recovery system controls.

The multivariable model-predictive advanced controls (MPC) use dynamic process models built on historical data to predict where the process is going and make appropriate corrections to optimize it, for, say, throughput, cost or quality parameters.

"It learns the past to predict the future," says Beall. The controller understands which parameters and variables are manipulated, controlled, disturbance and constraint variables. It calcu-

lates a set of output moves to bring all controlled variables to their targets".

As one might expect, the manipulated variables, such as steam or solvent flow, are used to achieve the controlled variables, but in APC, the other variables are allowed to float within constraints to achieve the higher goal of optimization. A well-tuned APC system also minimizes the effects of disturbances. Columns that are often upset by changes in feed qualities—lights and heavies—can be brought under optimum automatic control.

"It works like having your best operator right on that column all the time," Beall says. With conventional controls, "It's easier to run a column by overdriving it—more steam, more reflux. With MPC, it's common to get 5% to 25% steam savings right away."

The Firestone project began with a benefit analysis, analyzing historical data to find the best achievable steam-to-feed ratio. Then the engineers established a base case to represent current operations, measure the project's potential return on investment and, ultimately, baseline its real improvements.

Through multiple APC projects around the world, Emerson has developed an extensive library of advanced control applications that can be reused and configured for a specific project. This library drives down the cost of implementing advanced control functions by providing pre-engineered, tested, configurable control modules.

The DeltaV Predict system offered a six-month payback and was installed and commissioned in 16 weeks. "Steam savings on five columns and the vent recovery system add up to \$34,000 per month," says Brown. She and one other onsite engineer will support the system, with perhaps an occasional call to Beall.

And that's how you get distillation columns to use less steam. ■



"Steam savings add up to \$34,000 per month." Firestone Polymers' Nikky Brown told how the company is saving money and cutting its carbon footprint by using model predictive control on its distillation towers.

EMERSON, BEAMEX TEAM UP ON CALIBRATION AT GSK CORK

Calibrating one device isn't so hard. Doing a few hundred or a few thousand is tougher. But calibrating all of them in a large pharmaceutical plant governed by the U.S. Food and Drug Administration's CFR 21 Part 11 regulations is a whole different ballgame of required validations and certifications.

To give their pharmaceutical end users some much-needed assistance, Emerson Process Management and Beamex recently developed an innovative method for linking Emerson's Asset Management Suite (AMS) Device Manager (DM) software with Beamex's MC5 portable calibrators and CMX software. This technical partnership allows calibration data to be collected by AMS DM; transferred to MC5 and CMX for analysis, verification and sign off; and then sent back to AMS for documentation and certification. This streamlined process can save users hundreds of hours compared to traditional calibration and validation procedures. This data transfer also is aided by Beamex's CMX Connection software.

"Emerson recognized that our existing Device Manager tools and strategies might not be enough for users in the more regulated process industries," said Richard Barnes, Emerson's plant asset management and asset optimization consultant. "So we integrated AMS DM and CMX so they can exchange information with help from CMX Connection and greatly reduce calibration times."

GlaxoSmithKline's (GSK) plant in Cork, Ireland, has replaced its legacy, mostly manual calibration method with the combined AMS DM and CMX solution. The new system has been up and running at GSK Cork for about one year.

"We used to have a mostly paper-based calibration process. Forms were filled in by the technicians, and then data was entered manually by the administrators. It was very static system," said Don Brady, GSK Cork automation engineer. "So in the first quarter of 2009, we launched our Primary Supply Agile Engineering team, and they confirmed our calibration cost problem and assigned us to identify ways to reduce these expenses."

Brady and Barnes presented "Calibraton Excellence" and a separate live demonstration of the new AMS DM and CMX tool this week at the Emerson Global Users Exchange in Nashville.

Subsequently, GSK's calibration improvement project focused on three areas:

- Instrument diagnostics—including shifting calibrations of non-critical instruments from "on schedule" to "on demand," and relying on smarter diagnostics from instruments;
- Paperless calibration—to help shorten calibration time and eliminate non-calibration support functions, such as document management, manual approvals and correction of transcription errors;



"We've eliminated 21,000 sheets of paper per year." GlaxoSmithKline's Don Brady discussed the many calibration efficiency and accuracy improvements achieved at the company's Cork, Ireland, facility.

- Calibration analysis—to examine historical data and help recommend interval extensions between calibrations, so long as existing data shows that previous calibrations met stringent corporate policy.

“We’re trying to achieve calibration efficiencies by using condition monitoring to reduce our total number of calibrations and then performing the remaining calibrations in a timely and efficient manner,” explained Brady. “This means synchronizing instrument data between the calibration management and the asset management systems; using documenting calibrators; optimizing scheduling of planned periodic calibrations; and removing paper from the calibration process.”

Brady added that GSK Cork is a highly automated manufacturing facility and serves as the primary production site for several of GSK’s best-selling products. The plant employs more than 300 people and contains about 4,000 instruments, including mostly HART and Foundation fieldbus devices, installed over the last 12 years. The vast majority of these instruments are connected to one of the plant’s six DeltaV systems, which employ a combination of rack I/O, remote I/O and Foundation fieldbus I/O systems.

“Besides being required to have CFR 21 Part 11-compliant signatures for data entry and approvals, we also had to monitor 1,100 smart-instrument diagnostics, develop an audit trail for 1,100 changes to that smart instrumentation and electronically document our smart-instrument configurations,” added Brady. “We also had to overcome some resistance from staff, but they came around and par-

ticipated fully once they did some training and realized how beneficial the new calibration system was going to be. Our craft supervisors and technicians were included in the project from day one, so there were no operational surprises by the time we reached the go-live date.”

Brady reported that GSK’s calibration improvement project, including using the combined AMS DM and CMX, helped the facility reduce the steps in its overall calibration process from 17 steps to 10 steps; remove two steps that each posed risks of human data-entry errors; conduct Emerson and Beamex consulting workshops to review existing processes and optimize and refine the new processes to use improved technologies; and use the new system’s flexibility to manage workflow processes.

“We’ve also eliminated 21,000 sheets of paper per year,” added Brady. “And we streamlined our end-to-end workflow, which reduced our calibration time by about 15 minutes per calibration. We’ve also eliminated calculation errors and rework because pass/fail calculations are performed in real time out in the plant. In addition, we reduced scheduled calibrations by 8%, which was part of the data migration from a legacy system. We’re also generating email alerts when a calibration failure happens, but now only calibration failures need to be reviewed and approved. Finally, we’ve been able to extend some intervals between calibrations, which are recommended by the devices and system in the form of email alerts. So far, we removed 234 calibrations from our schedule during first 12 months of analysis, and this should peak during the third year of operation.” ■

ENERGY MANAGEMENT BEGINS WITH MEASUREMENT

Oil's likely to stay around \$100 a barrel; natural gas is not as cheap as it used to be; and energy prices are volatile, making it expensive to hedge by buying long-term contracts. Your energy security depends on getting a grip on where your gas, compressed air and steam are going, and what you can do about it.

In their Emerson Exchange Wednesday morning session, "You Can't Manage What You Don't Measure: Getting a Handle on Plant Energy Usage," Emerson Process Management pressure measurement expert Brian Fretschel and flowmeter guru Joel Lembke talked about opportunities they've seen for reducing energy consumption, starting in the utility plant.

At 75% of operating costs, energy is an impressive line item at most facilities. "A typical process plant can save from \$200,000 to more than \$10 million a year by reducing energy consumption 10%," Lembke said. At the high end, in terms of reducing carbon emissions, "That's like taking 23,000 cars off the road."

Monitoring energy is a precursor for finding opportunities to reduce it. Lembke said. "It's 'Step 0'—putting the right monitoring in place so you know where the energy is going." Monitoring lets you:

- Allocate usage by operating unit;
- Correctly calculate cost and efficiency of operation;

- Identify opportunities for improvements;
- Balance mass and energy;
- Identify problems, detect leaks;
- Resolve billing conflicts;
- Comply with environmental regulations.

Being able to measure energy and steam flows and do energy and mass balances for different boilers can allow you to run the most efficient boilers more of the time, a low-capital way to reduce energy consumption. But measurements themselves must be made thoughtfully. For example, a nozzle steam flowmeter on a main line in a Colorado power plant caused a 7.5-psi pressure drop, which translated to a 0.5% loss in power plant efficiency worth \$149,000 per year. (A low-pressure-drop Annubar flowmeter fixed it.)

Compressor and blower systems call for attention to pressure drops. "Instead of an orifice plate, consider an averaging Pitot tube," says Fretschel. That's how a large smelter reduced blower pressure requirements from 21.5 psig to 16 psig, saving \$500,000 per year.

From wireless to flow conditioning to steam moisture and trap monitors, Lembke and Fretschel described many other examples of solving application issues and saving energy with pressure and flow instrumentation. With Emerson technology, there's no excuse to stay ignorant about your energy consumption. ■



"That's like taking 23,000 cars off the road." Emerson's Joel Lembke, together with colleague Brian Fretschel explored the potential for process plants to reduce their carbon footprints significantly.

JUST DRIVE: LET EMERSON WORRY ABOUT THE DCS

Imagine if you could build the perfect car. Engineers at Bayer MaterialScience (BMS) in Germany did just that, choosing wheels from a Porsche, the grill from a BMW, the rear end of a Volkswagen Beetle and the rest of the body from an Audi.

“It’s the perfect car, but can we afford to build it?” asks Ward Beullens, an automation engineer with BMS, responsible for process automation systems worldwide. “And if you have such a car, where do you go for maintenance?” Instead, maybe it makes sense to just drive the car—and leave the design and maintenance to somebody else.

That’s what the BMS engineering team decided to do with its distributed control system (DCS), outsourcing non-core activities and letting Emerson take over full responsibility for designing and maintaining the system. That leaves BMS’s controls, informatics, process and reliability engineers (no DCS engineers here, Beullens points out) free to focus on delivering value specific to Bayer’s production operations.

The team’s engineers have become overloaded with strategically important initiatives, Beullens says. These include control performance monitoring and improvement, asset management, alarm management, process information and manufacturing execution systems, and operating training systems, in which BMS is investing heavily. “We introduced all this stuff, and we are

expecting the engineers to use them,” Beullens says. “We added a lot of expectations. We gave them a lot of tools. But we didn’t free up their time to use them.”

But now Emerson has taken on system support responsibilities and guarantees greater than 99% availability—leaving the customer to drive the car. BMS has been running a pilot project in Leverkusen, Germany, with Emerson for about 18 months, Beullens says. The plan is to continue with it and transfer it into a more permanent collaboration. The company is doing the localization prep work for its site in Caojing, China, and will begin a pilot program with two systems there in 2012, bringing additional systems on after successful completion of the pilot program. From there, it’s on to the site in Baytown, Texas. “I would like to have all the world on this approach, but we will learn a lot [in Caojing and Baytown],” Beullens says. “Then we will think about moving this to other regions.”

In the meantime, challenges remain for both companies. Emerson must roll out and support all tools globally. This is not necessarily easy, because the equipment must match the needs and capabilities of the local labor force. At BMS, Beullens wants to have a governance structure that is cohesive, but the challenge is to make it lean, he says. There is still some convincing that has to be done, both of management and employees, and cultural barriers must be crossed. ■



“We added a lot of expectations. We gave the engineers a lot of tools. But we didn’t free up their time to use them.” Bayer Material Science’s Ward Beullens explained that when BMS engineers were asked to take on more important core activities, it made sense to outsource the design and maintenance of their DCSs.

BEST-IN-CLASS ORGANIZATIONS INTEGRATE SAFETY AND CONTROL

When Mike Boudreaux flew from Austin, Texas, to Roanoke, Va., via Washington, he didn't imagine that the second leg of his flight would be cancelled. He didn't imagine that it would be the last flight out of Dulles International Airport that night, and the next morning's alternative wouldn't get him to his presentation on time. He didn't imagine that he'd have to rent a car and drive four hours instead, arriving at 2 a.m. But he should have.

If he'd talked to others familiar with the route before booking his trip, he would've known that that particular flight often gets cancelled because it doesn't have enough passengers. If he'd planned ahead, he might have booked an earlier flight instead. There was plenty of data readily available showing the flight's high cancellation rate, but he didn't look at it because it wasn't at the point of purchase. "I didn't have a plan B," Boudreaux admits. "I didn't have a contingency plan."

You've heard it plenty of times before: You need a contingency plan. That's particularly true when it comes to safety. As director of Emerson Process Management's platform business development, Boudreaux understands well the importance of a contingency plan. But what might not be as well understood is just how closely best practices in safety management lifecycle correlate with best-in-class business performance.

At the Emerson Global Users Exchange in Nashville on Wednesday, Boudreaux detailed results of an independent study done last year by Aberdeen

Group. The study relates overall equipment effectiveness (OEE) and how best-in-class organizations handle their safety plans. The study helped to verify what Emerson had been telling its customers already: Best-in-class results have a strong correlation to the use of integrated control and safety systems.

"Best-in-class organizations in overall equipment effectiveness had established a formalized risk management strategy, which makes sense, and had also ingrained safety into their cultures," Boudreaux said. The study also showed the success of implementing a single platform to perform safety functions and plant operations, he added.

"The integral is greater than the sum of its parts," Boudreaux said, explaining the dangers of manually passing data between separate systems. "You end up with limited visibility. You end up having human error along the way. Any time hands are involved in taking data from here to there, human error is involved." Integrated systems, conversely, benefit from reduced complexity, reduced implementation costs, increased visibility and reduced human errors along the way.

Boudreaux walked workshop attendees through analysis, implementation and operation phases, detailing the importance of safety lifecycle planning throughout. Though the details of the system should not be overlooked, the key message was that integrating those phases and systems greatly reduces the chance of being surprised by safety issues within the process. ■



"The integral is greater than the sum of its parts." Mike Boudreaux, Emerson's director of platform business development, detailed the benefits of a lifecycle approach to safety management, as well as integrating safety with controls.

BRING THAT USER GROUP SPIRIT HOME WITH YOU

There are countless chances to talk, trade ideas and learn from colleagues during Emerson Global Users Exchange, but it only happens for one week each year. And even if you're lucky enough to go and pack in a full schedule, you can still only attend a tiny fraction of all the cool and useful workshops, courses and exhibits.

Wouldn't it be nice if you could visit Emerson Exchange and confer with your fellow attendees whenever you wanted? Well, now you can by joining the physical event's new online community, Emerson Exchange 365, located at <http://community.emersonexchange.org>.

Emerson Exchange 365 was unveiled on the first day of this year's event by Social Media Director, Jim Cahill, and Online Marketing Manager, Mike Tongwarin, who presented added background on the new effort.

"Our vision is to cultivate and grow an online community that will be closely connected," says Cahill. "We want all members to have the same peer-to-peer status, so anyone will feel like they can connect with anyone and ask, 'Hey, what about this?' or

suggest, 'Have you tried this?' and then contribute whatever they can."

The template for Emerson Exchange 365 was developed by Tongwarin and the company's Micro Motion division, which launched its community in 2009. The site now has 1,700 members. He reports that the online community's primary benefits for its users include:

- Delivering an everlasting communications channel for its members;
- Providing a global reach to members, especially to those in developing countries;
- Giving members access to instructional and educational videos;
- Conveying advice and thoughts from industry leaders;
- Trading tips, tricks, strategies and advice with other Emerson Exchange 365 members—just like at the physical show.

"Of course, face-to-face meetings at Emerson Exchange are still the best, but Emerson Exchange 365 will bring a taste of the event to the rest of the year and keep those bonds established until next year," added Cahill. ■



"Our vision is to cultivate and grow an online community that will be closely connected." Micro Motion social media pioneer Mike Tongwarin, together with colleague Jim Cahill, urged Emerson Exchange attendees to engage with their industry peers online at Emerson Exchange 365.

SOUTHERN STATES AWARDED FOR PLANTWEB EXCELLENCE

Lunch is good. Lunch with a little professional recognition from your peers is even better.

In another highlight of the 2011 Emerson Global Users Exchange this week in Nashville, 11 customers and their local business partners were selected as winners of Best in Conference Awards for workshop presentations, and another innovator was honored with the annual PlantWeb Excellence Award.

The prestigious PlantWeb Excellence Award went to Bryan Beyer, acid operations manager at Southern States Chemical, for his presentation “DeltaV Electronic Marshalling Delivers Engineering Cost and Scheduling Savings for Greenfield Chemical Plant.” The company used Emerson’s CHARacterization Modules (CHARMs) to simplify and save wiring and labor at its new sulfuric acid and high-pressure steam plant in Wilmington, N.C.

“The criteria for the PlantWeb Excellence Award are exceptional application of PlantWeb technologies; broad use of PlantWeb components and interconnections; digital-capable, intelligent devices; open communication standards, linking field intelligence, systems and applications in a plant-wide network; DeltaV or Ovation automation systems that make the most of PlantWeb’s predictive intelligence; and consolidated, valuable asset

information collected using AMS Suite technologies,” said Steve Sonnenberg, president of Emerson Process Management, who presented the award to Beyer.

“Some of the business results Southern States achieved at its new plant included reducing wiring costs by 50% and reducing cable runs to the control room by 90%,” Sonnenberg said. “I/O on Demand made it easy to make late project changes and still meet the start-up schedule, and they also installed a plant evacuation system with an 80% savings over conventional approaches.”

The two other PlantWeb Excellence award finalists were EDF Energy, which presented “A Demonstration of the Principles Deployed for the EDF Energy West Burton Asset Management Solution,” and Potash Corp., which presented “PotashCorp New Brunswick Division Relies on PlantWeb to Save Money and Deliver Faster Start-Ups.”

Meanwhile, the Best in Conference Awards went to winners in each of the conferences 10 technical tracks. These included:

Asset Optimization

“Transition to Online AMS Reduces Maintenance Costs and Improves Operations” by David Rabon of Pfizer Inc. and Mike Ruhle of New England Controls.



Bryan Beyer (center) of Southern States Chemical receives the 2011 PlantWeb Excellence Award from Emerson’s Steve Sonnenberg (right) and Dave Imming (left).

Business Intelligence and Management

“Calibration Excellence: Intelligent Application of Smart Technology is Just the Medicine for Improving Business Results at GSK” by Don Brady of GlaxoSmithKline and Richard Barnes of Emerson Process Management.

Control System Modernization

“One-Day Version 10.3 Upgrade—How a Large Biotech Plant’s DeltaV Systems Were Successfully Upgraded in One Day” by Auguste Dionne and Dan DiMatteo, both of Amgen, and David Maglaya of New England Controls.

DeltaV and Ovation System Applications

“State of the Art Automation at Asphalt Loading/Blending Terminal” by Joe Shotwell of Asphalt Operating Services and M.C. Chow, Greg Juchniewicz and Hasit Patel, all of Novaspect

Instrumentation Applications (tie)

“Optimizing and Standardizing Your Plant Floor Machines with Flow Measurement of Your Inputs” by Scott Daniel of Pregis and Todd Fortman of Emerson Flow.

“LNG Dispensing Made Simple Using Micro Motion” by Kegan Kavander of Cryogenic

Vessel Alternatives and Nicole Rundlett of Micro Motion.

Process Optimization

“APC Reduces Energy and Lowers Carbon Footprint at Firestone Polymers’ Beaumont Facility” by Nikky Brown of Firestone Polymers LLC and James Beall of Emerson Process Management.

Project Management and Engineering Tools

“Project Management Successes with Global Teams Workshop” by Glenn Gregg of Emerson Process Management.

Safety Instrumented Systems

“Elements of a Successful Burner Management Project” by Kirk Adams of BP and David Shepard of Emerson Process Management

Valve Applications

“Union Gas Utilizes Fisher ODV Package for Anti-Surge” by Tom Grochmal of Union Gas (Spectra Energy) and Tom Brandau of Emerson Process Management.

Wireless Applications

“When the Heat is On: Control with Wireless” by Roy Gueldenzoph of Rosemount Measurement and Mike Pearson of Rosemount. ■



EXCHANGE HEADS WEST— AND EAST—IN 2012

As the curtain comes down on yet another fabulous week of “Exchanging Ideas and Creating Solutions” at the 2011 Emerson Global Users Exchange, it’s time to mark your calendars for the 2012 main event, which will take place at the Hilton Anaheim hotel in Anaheim, California, October 8-12, 2012. Next year also marks the first Emerson Exchange event to be held in Europe. It will be May 29-31 at the Maritim Hotel, Düsseldorf, Germany. In the meantime, don’t forget to check in with all your new friends online at Emerson Exchange 365—visit <http://community.emersonexchange.org> and continue the Exchange. ■

GENERAL MILLS QUILTS THROWING ENERGY DOWN THE DRAIN

By industry standards, the maintenance team at General Mills' refrigerated and frozen dough facility in Murfreesboro, Tenn., was doing pretty well at keeping up with monitoring steam traps. They didn't always get to their preventive maintenance rounds in a timely fashion, but they'd still eventually identify failures and were replacing about 20% of their traps every year.

They were also throwing \$44,000 worth of energy literally down the condensate drain. That turns out to be more than enough to justify a project to install Emerson 708 wireless acoustic monitors on the facility's 93 steam traps.

"In a healthy plant, 20% of the steam traps are probably failed or not working properly," said Richard Luneack, project coordinator for the Fluor team embedded at the plant, during his Thursday morning presentation, "Steam Trap Monitoring." When traps leak or fail open, raw steam floods into the condensate return lines, wasting energy and raising back pressure on other traps. On an open condensate system, you may see steam pouring out of the roof vent.

When a trap fails closed, the system it controls can flood, compromising the efficiency of heat exchangers that drive production, inducing water hammer and even leading to mechanical failure. Luneack said, "If you're standing around there when that happens, you can get burned."

Steam traps are conventionally monitored by inspection using a combination of instrumentation,

such as thermal imaging, temperature probes and ultrasound detection. "It takes about two hours per trap to do it properly," said Luneack's co-presenter, John Hillencamp, senior sales engineer, Emerson Process Management.

Luneack made a simple cost analysis based only on energy savings and easily justified the steam trap monitoring system. The team started with a pilot of nine sensors, which are simply band-clamped to the steam pipes, preferably about six inches upstream of the trap. The initial system transmits over distances of up to about 400 feet and penetrates concrete block and tip-up walls, pre-stressed concrete floors and even the insulated steel walls around some of the hot equipment.

The transmitters measure sound intensity to detect leaking traps and temperature to detect traps that have failed closed. Trap status is displayed on a preconfigured dashboard as OK (green), leaking (red) or failed closed (blue). "With the software, you have to do a little set-up," Luneack said. "For the first nine traps, it took about five minutes."

On start-up, the system won approval from the maintenance technicians when a bucket trap they'd suspected of leaking was immediately flagged red. Based on the pilot's success, Luneack put 84 more Model 708s on order. After that, Luneack plans to analyze the steam traps in the adjacent Yoplait plant and to look at monitoring relief valves. "We also have a large ammonia refrigeration system," he says. "We want to know right away if that relief valve opens." ■



"In a healthy plant, 20% of the steam traps are probably failed or not working properly." Fluor's Richard Luneack described the significant incentives for continuous monitoring of steam trap health.

UNIQUE HMI IMPLEMENTATION ENSURES THAT OPERATORS THINK TWICE

When folks debate about how to set up an operator interface, the conversation usually heads toward making things as easy and as intuitive as possible. But what if your goal in life is to make things harder for the operator?

System designers at Savannah River Remediation (SRR) decided that things were too easy for their operators. It was too easy to set operations in motion with single clicks of a mouse. “I want to slow the operators down; I want to force the operator to think twice,” said Jim Coleman, principal engineer at the Savannah River site in Aiken, S.C. Coleman described SRR’s unique challenge and solution this week at the Emerson Global Users Exchange in Nashville. “In our industry, errors are absolutely unacceptable.”

The industry is remediation of radioactive waste. The U.S. Department of Energy facility doesn’t make bombs, but it makes the juice that goes into the bombs, Coleman explains. The waste from those nuclear weapons has been put on-site in 51 holding tanks carrying some 37 million gallons of “highly radioactive nasties,” he said. “Our goal is to clean the ‘ooky’ out of these tanks and put it in storage for the next million years.”

That “ooky” removal process is a highly automated one in which buckets of radioactive soup are scooped from tanks, mixed with a special sand and then cooked in a melter at 1,200 °C and turned into glass. “It’s the Cadillac of disposition meth-

ods for our nation as far as dealing with radioactive waste.”

However, Coleman tells a story of one operator walking into the control room talking to another and sitting down on the desk. “He put his hiney on the keyboard,” Coleman says, and hit a combination of keys that turned off the ventilation fans controlling radiation in the facility. “That was a big problem. We want this guy to slow down, think twice.”

So what the engineers did was to incorporate extra steps into the interface, forcing operators to perform at least two clicks with a mouse move in between to take an action. The designers used an out-of-the-box Emerson faceplate and added Accept and Cancel buttons. They had to be sure to avoid pop-up messages so that the operational graphic would never be covered, therefore, they added a separate faceplate at the bottom of the screen instead.

They made some other changes while they were at it, including using messaging to give operators more visibility into activities outside their primary view, getting supervisor approval for critical actions and prodding operators with reminders. All of the modifications, Coleman points out, can be done with out-of-the-box Emerson tools. “We don’t want to write special code,” he explained. “Also, this way all this stuff will upgrade, and we don’t have to do anything special for that to happen.” ■



“I want to slow the operators down; I want to force them to think twice.” Jim Coleman, principal engineer at Savannah River Remediation, explained how he modified a standard operator interface to greatly reduce the chance of operator errors in a critical industry.

COLLABORATION PORTAL HELPS SPEED SIS VALVE TURNAROUND FOR BP

One missing valve certification document or buried e-mail with a repair specification is not a big problem. The problem is that there's never just one.

To combat these organizational goblins, maintenance engineers at BP's Texas City refinery and their local business partner, Puffer-Sweiven, recently completed a huge valve turnaround project in just under nine weeks. Stacy Baltzegar, BP's instrument and control reliability engineer, Tate Cunningham of Puffer-Sweiven and Ryan Baker of Emerson Process Management presented "Texas City Turnaround: BP's Story of Supersized Scope and Real Results" this week at the 2011 Emerson Global Users Exchange in Nashville.

BP Texas City is the third-largest refinery in the U.S., and processes 3% of the nation's gasoline. The 1,200-acre facility has more than 2,000 employees, who run more than 20 process units producing gasoline, ultra-low-sulfur diesel, jet fuel, feed stocks and heavy fuels.

The valve turnaround project came to encompass "every valve associated with our safety instrumented system (SIS). They all had to be pulled and shopped to establish the health baseline for starting a new program with known conditions," he ex-

plained. "This boosted our scope from 212 to 457 valves—all scheduled for Class A repairs. Without enough manpower to oversee timely decision-making, our turnaround schedule was threatened. But the repair window was extended to just over eight weeks, which put the plant at risk for lost production."

To address safety and quality assurance/control issues, meet agreed-on lead time and deadlines, and support SIS lifecycle expectations, BP and its partners decided to use two primary tools to organize the valve turnaround project: a custom collaboration portal based on Microsoft SharePoint software, and the Emerson Process Management Six-Step Turnaround program.

The customized SharePoint application gave BP's team a common, online location to communicate 24/7 with each other. This allowed easy project assignments and updates; prevented the loss of useful inventory items and requirements; helped maintain efficient workflow by widely disseminating revised tasks; and enabled thorough documentation.

"Everyone had immediate access to review the conversations about specific issues as they arose," said Baker. "By the end of the turnaround, all team members were using



"Without enough manpower to oversee timely decision-making, our turnaround schedule was threatened." BP's Stacy Baltzegar, together with Tate Cunningham of Puffer-Sweiven and Ryan Baker of Emerson, explained how they were able to effectively manage the turnaround of 457 SIS valves in only eight weeks.

SharePoint on a daily basis as the primary source of contact.”

Meanwhile, BP’s use of SharePoint dovetailed with its deployment of Emerson’s Six-Step Turnaround Management Process. The six steps include:

- Outage development—early engagement and advance preparation to reduce costs;
- Project kick-off—clarify broad definition of scope, timing, duration and budget;
- Refining details—review technical options and maintenance practices to confirm requirements and prioritize work plan;
- Internal planning—define roles, plan required resources, provide training and create communication plan;
- Outage execution—perform work to specification, communicate status reports and document change-orders;
- Outage review—conduct post-turnaround meeting, present final documentation package.

“The Six-Step process advises doing pre-planning where possible to minimize discovery, keeps meticulous records to

establish baseline data and seeks lessons learned in its documentation for future reference,” reported Cunningham. “The SharePoint discussion area supported changes and discrepancies without a lag in communication, and we also used its alert structure to notify critical personnel of updates in the units. As a result, we saw deviations in the inbox immediately, so we know there was a valve to address, and it took our responses down from hours or days to minutes.”

Baker added that, “Integrating SharePoint with Six-Steps created a more fluid process. The key tools that helped us were data tracking, daily status report, return dates, discrepancy and deviation issues, and documentation management.”

Balzegar concluded, “SharePoint and Six-Steps means that scope changes on a ‘moving target’ were communicated effectively, avoiding lost revenue and unexpected downtime. Consequently, we completed our turnaround on schedule and even reduced our repair window for control valves by three days. Finally, we gained a lot of efficiency in documentation management.” ■

BLEVINS AND NIXON TOP ISA BESTSELLER LIST

Last week at the ISA Automation Week event in Mobile, Ala., Emerson Process Management’s very own Terry Blevins (left) and Mark Nixon were honored with the “Raymond D. Molloy Award” for penning ISA’s bestselling book of 2010: *Control Loop Foundation - Batch and Continuous Processes*. Blevins and Nixon developed this important reference—which is complemented by a series of 19 online tutorials—to help process manufacturers quickly train new engineers in commonly used instrumentation and control strategies, technologies and methodologies. The website at controlloopfoundation.com also includes YouTube videos that walk readers through the solutions to the exercises presented in each workshop. The book is available as an eBook for iPad and Kindle, and the dynamic duo have even taken Foundation on the road, first piloting an in-person course in Manila, with upcoming sessions scheduled for Austin, Costa Rica and Australia. ■



QUALITY BEING REDEFINED IN BIFURCATED CHEMICAL INDUSTRY

If there were an award for most compelling session title at this week's Emerson Exchange, it would probably go to Jos Berkien and Chris Hamlin, who put forth, "The Death of Quality and the Manufacturing Abyss." The reality of the presentation was a little less stark, but nonetheless compelling.

Hamlin, marketing director for global chemical industries at Emerson Process Management," and Berkien, expertise leader of the instrumentation and automation department for AkzoNobel Engineering & Operational Solutions in Arnhem, The Netherlands, presented the "thought experiment. "We believe some of it; we don't believe other bits," Hamlin said. "We're not going to tell you which is which."

The point about quality, however, has to do with the bifurcation of the chemicals industry and the death of quality "as we know it." There was previously a continuum within the industry that ranged from large manufacturers producing high volumes of chemicals with cost as the only differentiating factor, on through to specialty manufacturers with differentiated products made in low volumes at a high price. Today, the two extremes still exist, but there is a chasm in between where there once was a range of intermediate chemical suppliers, Hamlin said.

Quality, he contends, is no longer a relevant factor. On one end, the supplier is trying to be as big as it can be to dilute fixed costs. It needs to make products "just good enough" to meet spec, because too much quality is not cost-effective. What's happening on the other end of the spectrum has more to do with delivering agile capabilities, integrating specialty products into the supply chain to provide solutions at the point of use. There's no longer a premium offered for "quality" products because it's services that are being offered these days. Instead, quality is simply a means for the supplier to drive consistency or lower its service costs.

AkzoNobel is the largest paint and coating company in the world and is major producer of specialty chemicals. By way of example, it now offers remote-controlled chlorine production (RCCP) facilities placed at customer sites. Rather than ship chlorine as a product to its customers, AkzoNobel provides chlorine services, making sure chlorine is readily available at the customer's site.

"It's a complete factory, but it's on the customer's site," Berkien said. "Traditionally, we would transport the chlorine wherever we needed to." Now, however, the customer wants the chlorine as a service, available as needed. "We are linked with them, with

their control system. When their production goes up, we can put our output up as well."

There's a similar situation in the adhesives end of AkzoNobel's business. Rather than selling furniture adhesive to Ikea as a product, for example, AkzoNobel now provides a complete gluing service to the furniture retailer. "We have the machines to glue all their wood together," Berkien said. "We're responsible for making sure the system is running. And we have to take care of the waste also."

"What I've talked about conceptually is actually happening in reality for them," Hamlin said. "They thought they were a chemical company." Instead, the model has changed, and they've begun selling capability rather than products.

Hamlin and Berkien contend that the automation industry could go the same direction as chemicals. To serve low-cost, high-volume chemicals manufacturers, automation suppliers could just be tasked with keeping a plant running. Automation is not a core competency for these manufacturers. On the other end of the spectrum, "Flexibility and agility is a competitive advantage," Hamlin said. So those manufacturers are likely to keep their automation competency in house. ■



"They thought they were a chemical company." AkzoNobel's Jos Berkien, together with Emerson's Chris Hamlin, discussed the split of the chemicals industry into low-cost commodity providers on one side and providers of "capability," not chemicals, on the other.

WIRELESS PROVIDES STEELMAKER NEW VIEW OF ENERGY USAGE

When folks talk about energy monitoring, they're usually referring to utility bills, watt-hour meters and monitoring flows of fuels and gases. The same holds true at the average steel mill. "Steelmakers usually only measure the energy that ends up in the product," said Dave Smith, business unit manager at Wunderlich-Malec.

But Smith's Thursday morning session at this week's Emerson Global Users Exchange, "CMC Steel Wireless Energy Monitoring System, Cayce, S.C." with Greg Huey, Emerson wireless area sales manager, was about something completely different—a project with UT-Battelle, managing contractor for Oak Ridge National Laboratory (ORNL), to monitor how energy distributes through the steel-making process and discover where it is used, wasted and lost.

On top of that, they wanted to do it with wireless technology. "The overall objective for UT-Battelle ORNL is to facilitate the deployment and installation of wireless sensor networks in the steel industry and to aggregate the produced data to realize and document the resultant energy savings," Smith said.

To do it, Wunderlich-Malec designed and installed a system and network of HART wireless devices to collect process values such as stack gas and cooling water temperatures and

flows. The information will be archived and remotely monitored by UT-Battelle ORNL and used in energy-related performance calculations. The plant studied its priorities and selected the melt shops and their electric arc furnaces for the initial implementation.

Due in part to the arcs themselves, "Steel mills are noisy environments," Smith said. A full wireless site survey looked for potential sources of interference and found significant amounts of amplitude-modulated (AM) noise. "That shouldn't be a problem," Smith said, but with a plan to install as many as 1,000 I/O and distances ranging up to 850 feet, "We thought it was very important to find out if the technologies we thought would work actually would work."

A proof-of-concept test was performed by hanging a few transmitters and a gateway. "We took a small bite of the apple," Smith said, "and it was good." They proceeded to train the installers and perform the implementation, which was completed in August. Smith's only disappointment came on the day of the acceptance test: Testing began at 8 a.m. and by the time he showed up at 10 a.m., it was already done. He missed it.

Now CMC Steel has a reliable HART wireless infrastructure and access to pro-

cess instrument signal values that will help the company review operation and energy performance efficiency. SCADA software collects and stores data from the plant site and provides remote access to both UT-Battelle ORNL and CMC. They have the ability to view the operation status on-line, see health and history of instrumentation signals and to retrieve stored data for downloading and calculations at ORNL.

Using wireless minimized the field installation time and reduced the quantity of wiring/conduit to connect to the SCADA system. Process data can be transferred to higher-level UT-Battelle ORNL systems in standard SQL database files via a VPN behind a firewall.

The steel industry is very globally competitive, and the project's objective is to lower the cost of production by a significant amount: \$1 per ton. When CNC saw the information coming from the wireless monitors, "We realized that this system would provide a new way of seeing into the plant," Smith says, "a way for U.S. industry to have what it needs to know to be competitive in the global marketplace."

Next on the list for this tracking and analysis—the rolling mill. ■



"We took a small bite of the apple and it was good." Wunderlich-Malec's Dave Smith discussed how, after a successful proof-of-concept trial, wireless instrumentation was rolled out in an electrically noisy environment at CMC Steel.