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Best of CONNECT 2016

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The editors of Control and Control Design are on site at the 2016 Schneider Electric CONNECT Automation Conference in New Orleans, La., to bring you breaking news, innovations and insights from the event.

A STRATEGY FOR SUCCESS INVOLVES INNOVATION AT EVERY LEVEL

Schneider Electric kicks off its CONNECT 2016 conference with its strategy for success through hard times.

By Paul Studebaker, editor in chief, *Control*

In 2015, process and power automation companies around the world saw glimmers of relief from the global recession rocked by free-falling oil and commodity prices, as well as fits and starts in economies from the Americas to Europe and China. “The past one-and-a-half years have been pretty challenging,” said Gary Freburger, president, process automation, Schneider Electric, to many of the more than 800 attendees from 40 countries at the company’s CONNECT 2016 customer conference this week in New Orleans.

“Oil prices have put pressure on industry as a whole to look at things differently,” Freburger said. But Schneider Electric is weathering the storm and is well positioned to take full advantage of today’s industry trends, with or without rising commodity prices.

“Five years ago, we began fixing our business, our products and the way we go to market. With Schneider’s support, we’ve spent a lot of money, and now we’re in a good place. We have the technology the market needs to reduce risk, speed time to first production and lower overall cost. With the recent fall in oil prices and slowdown in capital expenditures, we have been able to gain a lot of ground. But expectations are changing—things will look different—so we must continue to innovate at every level.”

Chris Lyden, senior vice president, Schneider Electric, said, “Life at \$40/bbl looks a lot different than at

\$115. We’ve needed to reduce project costs by 30-50%. You can’t just chase low-cost engineering around the world; you have to get the man-hours out. And when oil prices go up, we can’t raise our prices. So we have to stay good, to get projects justifiable at the new level.”

Schneider Electric kicks off its CONNECT 2016 conference with its strategy for success through hard times.

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To do that, Schneider Electric has increased flexibility to get automation off the critical path. "We've done a lot of work on tools, our process and technology," Lyden said. One example is the FLEX system for flexible execution, a mix of technologies to minimize risk in project time to first production and overall cost while optimizing project execution and quality.

Schneider Electric has customers at every level to support and drive innovation. For example, at the system level, ExxonMobil is driving an initiative to open, simplify and automate the engineering, configuration and commissioning of its systems. "We subscribe to that concept and support it," Freburger said. "It's a once-in-a-career opportunity, over the next three to five years, to participate in making multi-generational changes that we all will live with for a long time."

Other frontiers of innovation include connectivity and the Internet of Things (IoT); further integrating Modicon, energy businesses and services; and cybersecurity.

In connectivity, wireless is moving from secondary measurements to being secure, cost-effective and robust. "A real opportunity is coming, and it's an enabler of IoT and open systems, including networking of control components," said Lyden. "When it comes to IoT, everybody has something on the website, everybody has their own ideas. We have ours; it's just not ready for release yet."

IoT is offering the potential for a digitized services transformation, with connection, analytics and business models to reduce operations expenditures and improve efficiency, said Nathalie Marcotte, vice president, Industry Services, Schneider Electric. "But it's easy to get caught up in the technology and what it can do. We have to keep all the end users—operations, maintenance and the user—in mind and be sure the business case is there."

IoT and connectivity bring cybersecurity concerns, "but we can build it in and apply patches as a remote service," Marcotte added. "Users will learn that connectivity is a value, not a risk."

Connectivity brings great opportunities in analytics and predictive technologies, with ways to see where something is different and where it is going wrong, said Raja Macha, vice president, process automation, Schneider Electric. "It takes innovation at multiple levels to move 35-40% of the cost out of the system."

Innovation also is apparent in project delivery. "We mainly deliver in two ways: directly on large projects, with a full range of offerings from power through automation, where FLEX technology and universal I/O are great enablers. And through system integrator (SI) partnerships," said Chris Dartnell, vice president of global sales, Process Automation, Schneider Electric.

"It's a challenging mix of direct and indirect," added Freburger. The company spent the past year rebuilding its SI model "with a lot of good feedback from the SIs," he said. "There has to be a balance there, and we think we have a pretty good view of how that balance can work."

"It's really a services business, whether it's a greenfield installation or support services. Migration, integration of Schneider Electric products, connecting across the business and Modicon—services mean more than maintaining the installed base. We must stay close to the market and provide the right balance of building on success and being where the market will end up. If oil goes up to \$100/bbl, good, but it won't change the path we're on."

"We are so lucky to be part of this business at this time, to be able to change the way the next two generations of how this business works. Our part is innovation at every level—technology, product, services—to constantly ask and answer the question, 'How can we bring value?'"



Paul Studebaker is chief editor of [Control](#). He earned a master's degree in metallurgical engineering and gathered 12 years of experience in manufacturing before becoming an award-winning writer and editor for publications including [Control](#) and [Plant Services](#).

INNOVATIONS ABOUND IN CONNECT EXPO HALL

Schneider Electric and its partners show how coordinating process control technologies can optimize users' applications and ensure their success.

By Jim Montague, executive editor, *Control*

Like a really great gift basket with seemingly endless treats, the Expo Hall at this week's Schneider Electric CONNECT 2016 user group conference reveals one terrific surprise after another.

The Expo Hall is organized by industries, functional areas, Schneider Electric technologies, and its Collaborative Automation Partner Program (CAPP) members. In the Industries section, there are booths highlighting the company's capabilities in power, mining, water/wastewater, upstream and downstream oil and gas.

Close by, in the hall's Technologies sections there are kiosks featuring the company's remote SCADA solutions, field devices, Foxboro Evo and Modicon automation systems, FLEX project execution methodology, SimSci simulation and training software, RefineryWise software, and a host of other solutions to manage, maintain and protect users' applications, while keeping them safe and saving energy at the same time.

Martin Turk, director and global solutions architect at Schneider Electric, reported that, "My top five exhibits at CONNECT 2016 have to include PRiSM predictive analytics software that's now part of our Avantis platform; AIT advanced process analyzers; enhanced Tricon CX safety solutions; ongoing improvements to the Foxboro Evo process automation system; and the continuing evolution of the SimSci Spiral Suite software."

ONO for water/wastewater

Likewise, in the water/wastewater booth, Hermann Wartinger, vertical director for water/wastewater at Schneider Electric, is demonstrating how the company's Online Network Optimization (ONO) software tool can help users perform analysis, conduct leak

calculations, manage work orders, and maintain their applications day-to-day.

"ONO's operations SCADA screen can display a user's entire water/wastewater network, and run 20% of all their assets, even though 80% of these systems and equipment are typically underground," said Wartinger. "So, while simulation has usually been for designers and engineers, ONO's primary benefit is that it brings simulation to the operators, and they don't need lots of sophisticated knowledge and programming to do it."

Brazil mine relies on PES

The mining, metals and minerals (MMM) exhibit showcases how Schneider Electric's mine-to-port solutions balance utilization and availability for their users. "We still making big rocks into little ones, but our intelligent I/O and other new tools are enabling us to fully serve these supply chains much more easily," said Bob Cook, director of global industrial solutions for MMM at Schneider Electric.

For example, Cook and Rogerio Martins, MMM vertical director, demonstrated how Schneider Electric's electrical and power capabilities and its new PlantStruxure Process Expert System (PES) controls have aided Valé's €30-million, iron ore mining operation in Minas Gerais in Brazil. "We do onsite value-based consulting for our clients," says Cook. "We do gap assessments of projects, estimate different levels of value that can be achieved, and then customers pick the level that's right for them."

Intelligent I/O goes redundant

To chart Foxboro Evo's progress, Thad Frost, senior technology manager for Foxboro Evo I/O and enclo-

The Schneider Electric CONNECT 2016 Expo Hall floor is organized around various vertical industry solutions and technology families.

sures, stated that Schneider Electric introduced intelligent marshalling about five years ago, but clients still needed a smaller footprint, so it developed a half-size version that launched in 2014. These gave Schneider Electric its M200 standard universal I/O and M200 compact universal I/O, but they're being joined this week by FBM248 standard redundant I/O, as well as a universal I/O for safety built on the Triconex platform. They'll be joined later by a compact redundant I/O version.

"We see the market growing for universal I/O and redundant I/O to maximize uptime and reliability for users," explained Frost. "We're also working with Phoenix Contact on an interface for our universal I/O card called Viper, which is an I/O accessory that works with our IO card. This will allow builders to ship I/O cabinets without caring what signal they'll be handling because they can put in whichever accessory they need later. This gives us a hybrid solution that leverages the strengths of both hardware and software configurable systems."

All-Ethernet controller

At the Expo Hall's demo wall, Florent Lacharme, product offering manager for Schneider Electric's Modicon M580 controller, demonstrated a new ePAC device that seamlessly integrates in its local Ethernet network with help from added backplane connections for Modbus TCP/IP and EtherNet IP communications.

"This allows devices like rotors, switches and gateways to all be on the same DIN rail as the controller, where they're configured with our Unity Pro software, which makes the whole process much simpler and easier. This M580 platform is also very cyber-secure, and allows users to tune the level of security that's most appropriate for their application."

Stephen Golemme, technology manager for control room operations at Schneider Electric, added that, "Unity Pro's integration capability with Modicon and Foxboro Evo was released a couple of months



ago, and it allows users to take their PLC configuration file, and automatically build an interface with the database on their DCS. This lets them pick the tag names they want, use a naming wizard, and even do automatic renaming if their PLC's configuration changes later."

PES rules them all

To bring all these innovations together, Herve Vandem, PES offer manager at Schneider Electric, explained that its PlantStruxure PES has a single software environment, so users don't have to call up numerous tools. "PES is a perfect fit for smaller and medium applications with up to about 5,000 I/O, such as water/wastewater, mining, food and beverage, specialty chemical and others," said Vandem. "This system is distinct from and doesn't compete with Foxboro Evo, which handles large DCS-based applica-

tions with tens of thousands of I/O, such as in the chemical and oil and gas industry.”

“PES is using a pure, object-oriented approach to code in the controller and animation on the HMI. Traditional PLCs and SCADA requires users to add code, put in symbols, and establish links, which can result in simple mistakes. PES is simpler, brings the DCS model to PLC engineering, and integrates DCS functions with the flexibility and openness of a PLC. Also, PES does energy management, so users can gauge what’s consumed from anywhere in their plants, and compare it to levels of their product produced. Finally, PES is also integrated with M580, which makes it the most flexible process automation system on the market.”

Triconex unleashes Tricon CX; a new logic solver solution architecture

The latest addition to Schneider Electric’s distinguished resume of process safety, critical control, programmable controller solutions is its Tricon CX, which builds and adds to the outstanding history of the Tricon product originally released in 1985. Following a pre-launch introduction in 2015, meetings with customers and industry consultants led to minor refinements for Tricon CX and a new launch schedule, according to Mark Turner, manager of Triconex Safety Products. While the classic Tricon Safety Controller product can handle 400-460 I/O in one standard automation cabinet, he reported that Tricon CX will be capable of delivering double that amount, 800-920 I/O, and do it in the same space.

“And, as always, as part of the Triconex family, Tricon CX, provides our Customer base with a highly available, highly reliable, triple-modular-redundant, fault tolerant, control solution with no single point of failure,” added Turner.

FLEX unifies, executes projects

Finally, just as PES ties together software platforms, Schneider Electric’s Flexible Lean EXecution (FLEX) program gathers together formerly separate project elements to simplify tasks for its customers working on greenfield and brownfield projects in the oil and gas, power, mining, water/wastewater and other industries.

“Traditionally, projects and EPCs are governed by milestones, but configuring a process automation system makes up about 30% of the risk to startup dates,” said Stephen Gray, director of global engineering management at Schneider Electric.

“We want to take all that risk out, and FLEX helps users do that by bringing in and coordinating intelligent marshalling and standard cabinets, and by delivering data, auto-generated software and documentation to standard templates. This information can then be used by software like Intergraph’s Smart Plant Instrumentation (SPI) design tool, and as data matures, we do re-validations and change-management reports. FLEX takes those former milestones off the critical path, and can generate 20-33% savings in capital expenditures, while doing software and hardware builds simultaneously can save 30% on schedule time.”



[Jim Montague](#) is executive editor at [Control](#) and [Control Design](#) magazines. Jim has spent the last 13 years as an editor and brings a wealth of automation and controls knowledge to the position. For the past eight years, Jim worked at Reed Business Information as news editor for Control Engineering magazine. Jim has a BA in English from Carleton College in Northfield, Minn., and lives in Skokie, Ill.

EXXONMOBIL COMMITS TO THINKING DIFFERENTLY WITH ELECTRICAL INTEGRATION, CONFIGURABLE I/O

What prompted ExxonMobil to start thinking and doing things differently? Sandy Vasser, I&E manager at ExxonMobil, explains the transition.

By Mike Bacidore, editor in chief, *Control Design*

Think before you act. Several years ago, ExxonMobil began its journey to act differently, trying to find ways to improve success. However, acting differently first requires the ability to think differently, and that is a significant change.

“In the old days, we would improve processes incrementally and consistently. It’s a lot more complicated than that now,” explained Sandy Vasser, I&E manager at ExxonMobil. He spoke at Schneider Electric’s CONNECT 2016 user group event this week in New Orleans. Vasser has led a charge to change the way his organization acts by changing the way it thinks.

“We had to challenge our traditional automation practices and technologies,” he said. “We really had to think completely differently and put the old practices to the side.”

Vasser also stressed the importance of not waiting. “The oil and gas industry is currently at a low point in terms of number of projects, but this lull won’t last forever,” Vasser said. Further, all disciplines—not just automation—can make these changes. They translate well to other disciplines within the organization.

Because that’s how we’ve always done it

What prompted ExxonMobil to start thinking and doing things differently? Historical challenges were many.

“There were numerous dependencies on other disciplines, and this forces sequential execution,” said Vasser. “Design input was provided throughout the project life-cycle, and this forces numerous changes. The resulting designs are highly engineered, which makes them very customized and frequently changing.”



“We had to challenge our traditional automation practices and technologies.” ExxonMobil’s Sandy Vasser on the company’s move to re-examine decades-old project execution practices.

To reduce customization and rely more on standard solutions, ExxonMobil has pushed customization to the software, which allowed it to use standard hardware. This eliminated the need for custom project specifications and for the infrastructure to support customized solutions.

By reducing complexity and simplifying designs, it reduced the component count and the number of divergent systems, taking advantage of the capability of the installed systems. It simplified interfaces; it automated and sometimes eliminated processes; and it mitigated the effects of dependencies. “Intelligent I/O has allowed us to progress the hardware design without even knowing how the I/O will be used,” said Vasser.

ExxonMobil reduced the amount of documentation or often generated it automatically. It accepted managed risk and compromise, as it developed and enabled trust with suppliers and contractors.

“All of this has resulted in fewer components, reduced engineering, fewer drawings, reduced number of design reviews, elimination of FATs [factory acceptance tests], shortened schedules, smaller project teams, higher quality and lower costs,” explained Vasser.

Configure this

Smart, configurable I/O in standard field junction boxes is one of the key enablers that Vasser cited. Virtualization, not just of computers, but complete hardware virtualization has allowed the company to validate control system logic independent of system hardware.

“When we can test out all of our graphics and our alarms, that’s a significant improvement,” said Vasser. “Customization has been pushed from hardware to software. Cabinets, for example, were all different. But today all of our cabinets are a standard solution.”

ExxonMobil also is seamlessly integrating its automation and electrical systems. “We’ve combined

them, and it’s all included in the automation systems,” explained Vasser. Instruments are automatically detected, interrogated, configured, enabled and documented (DICED).

“We’ve used smart I/O to replace MCC [motor control center] wiring, simplified package PLC [programmable logic controller] interface solutions and increased use of dc power distribution. The smart I/O has allowed us to eliminate 60-70% of cabinet wiring; we’re getting rid of a lot of hard wiring between the packages and the MCCs. Electrical control interface improvements include monitoring of the electrical system. We’re always looking at ways to take advantage of smart I/O.”

Age in place

One of the important new opportunities, or challenges, depending on your perspective, that updated control systems bring is the concept of “aging in place,” where the infrastructure allows for upgrades as the system ages or technology changes.

ExxonMobil has embraced this by making system architectures simpler. “Systems consist of building blocks that can be easily upgraded to current technologies,” explained Vasser. “Upgrades or repairs will not be intrusive, disruptive or unnecessarily costly, and rip-and-replace will never be necessary. Control system selection for a facility is for life.”

As connectivity concerns become more prevalent, ExxonMobil has adopted cybersecurity by design. “Security can’t be solved only by rings of protection, such as firewalls, or by reactionary measures such as virus protections,” he said.

“We started with how to deal with change,” explained Vasser. “There are many opportunities to eliminate or streamline processes. Think about what you’re trying to achieve, and think differently about how you’re going to achieve those things.”



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SCADA SYSTEMS HARBOR UNTAPPED DATA

Water utilities look for ways to flow data in smart cities.

By Mike Bacidore, editor in chief, *Control Design*

The water/wastewater industry is feeling the stress of the growing world population, but smart-city technologies could have a profound impact on water supply, sanitation and the resulting energy consumption around the globe.

Black & Veatch is a global engineering, consulting and construction company, specializing in water, energy and telecommunications. The technology it integrates and deploys has changed considerably since the company was founded more than 100 years ago.

At Schneider Electric's CONNECT 2016 conference this week in New Orleans, Julie Inman, automation practice leader, water, and Steve Wortendyke, business development, smart integrated infrastructure—water, at Black & Veatch, shared their insights about water/wastewater trends, leveraging SCADA data and how the Industrial Internet of Things (IIoT) is changing the industry.

Emerging trends

"At the top level, we have our servers and applications," explained Inman. "The servers are collecting data and storing it. One trend we're seeing is the use of an Ethernet backbone for communications. Plants and their employees are also interested in using mobile devices. We haven't seen a lot in use yet, but they're asking about it. We're also starting to see remote access, especially for unmanned plants."

Below the servers and applications is the control level. "The trends we're seeing are smaller form factors and increasing options for communications," continued Inman. "Field devices are becoming a

lot smarter. There are 20-80 parameters you can get from these devices. And, instead of copper wires, this is being transmitted over fieldbus."

Now that all of this data is being collected, it needs to be connected and leveraged. "This has been a little slow to adopt in the water industry, mainly because of security," explained Inman. "In recent years, we've seen some directives from the government for increased security. Within a couple of years, there will be mandates. But manufacturers are already stepping up and implementing more security in the end devices."

These secure connections allow utilities to use a remote data hub to manage big data for optimization



"In recent years, we've seen some directives from the government for increased security. Within a couple of years, there will be mandates." Black & Veatch's Julie Inman discussed IIoT trends for the water/wastewater industry at Schneider Electric's Connect 2016 conference in New Orleans.

and adaptation of systems. “A smart city uses information and communications technology to manage its critical functions—infrastructure and social systems—in smarter and more integrated ways,” said Wortendyke. “On the water side of the business, utilities often view themselves as not being part of that smart city. However, they are integral to an overall smart city’s plan. To be greener, we must look at the biggest use of electricity happening in the plant—in the pumps and the distribution system.”

Efficiency driving smart-city initiatives

The rise of the smart city was spawned by wireless coverage, integrated infrastructure, data storage and process, cloud coverage and analytics, explained Wortendyke. Integrated infrastructure means identifying what sensors are needed to get the data and then deciding what to do with the data.

According to a recent Black & Veatch survey, the primary driver of a smart-city initiative is improving efficiency of operations, identified by 42.5% of the survey participants. And water utilities are increasing their use of cloud-based solutions, according to the survey. From an IT perspective, the business and operational driver for these types of initiatives is the single point of truth— where all of the data resides in one place.

“How can I use that data to better run that plant with visibility and performance optimization?” asked Wortendyke. “Within any community or utility, there are data silos. Cities benefit from synergies that cultivate system-wide intelligence driven by IoT.”

Wortendyke cited a recent project in which his company started with three silos of data, including the SCADA system. “We thought about using the historian as a data hub for a single point of truth, but we have analytic tools that we’re able to use, so we send it up to the cloud,” he said. “From the data hub, the analytics yield information through prescriptive calculations, predictive calculations and descriptive calculations, and they create key performance indicators (KPIs) based on items such as cost, chemicals and energy.”

Then visualization tools provide the ability to look at the information. “When you look at all of the data management systems, we want to inform you and help you to make a better call,” explained Wortendyke, who advised forming a data-management plan through the context of a SCADA master plan. “How does data management enhance this effort? Within the context of a separate data management master plan, look at all facets of data within a utility.”

The biggest trend is with organizations leveraging the data that’s trapped within the SCADA system, explained Inman, but to get from where they are to where they want to be, an automation plan needs to be developed.

“Assess where you are today,” she advised. “Where do you want to be? Where are the gaps? What do you need to fill those gaps? What brings the most value? Then, come back and revisit that plan because the technology does change. There are a lot of stakeholders who could have valuable input into the process. And, like it or not, there’s an IT component. We need to reach across that aisle to them.”



Mike Bacidore is the editor in chief for [Control Design](#) magazine. He is an award-winning columnist, earning a Gold Regional Award and a Silver National Award from the American Society of Business Publication Editors. Email him at mbacidore@putman.net.

FLEX INVESTMENTS TAKE AIM AT ENGINEERING COSTS

Automate configuration of control and safety systems as well as production of cabinet documentation and instrument loop diagrams.

By Keith Larson, group publisher, *Control*, *Control Design* and *Smart Industry*.

The low price of oil over the past two years has only reinforced the need for the process industries to execute projects differently, said Gary Freburger, president of Schneider Electric's Process Automation business, at a media briefing this week at the Schneider Electric CONNECT 2016 user group meeting in New Orleans.

"Industry is headed down a path, and that's not going to change even if oil prices rise," Freburger said.

Indeed, while automation typically represents only 2-5% of the total investment required in a given capital project, analysts estimate that automation has historically accounted for some 30% of project risk. Because automation system design is dictated by process design, automation work typically begins only after the process design work is substantially complete. Those inevitable late changes in process design cascade through a partially completed automation system design, necessitating costly and time-consuming rework, and confounding at-

tempts to get ahead. As a result, automation often remains stubbornly on the critical path to project completion.

Schneider Electric's FLEX methodology—which encompasses a range of tools, technologies and processes for project execution—is intended to reduce schedule risk as well as overall project costs.

"Customers have told us they need to take 30-50% of engineering costs out of their projects," added Chris Lyden, senior vice president of strategy and offer management, Schneider Electric. And while companies

Key technology elements of FLEX include Schneider Electric's Intelligent Marshalling configurable input/output (I/O) solution together with virtualization, reusable libraries of control system functionality, integration with SmartPlant Instrumentation design software, and a cloud-based engineering environment that allows personnel from around the world to collaborate on automation projects.



once might have relied on low-cost engineering centers around the globe to contain costs, rising wages have made that approach untenable. “We have to knock man-hours out,” Lyden said. And that has meant automating tasks such as configuration and commissioning wherever possible, reducing chances of error as well as overall effort and expense.

One labor-saving enhancement to the company’s FLEX methodology on display at this week’s CONNECT 2016 event is the integration of Intergraph’s SmartPlant Instrumentation (SPI) tool, commonly used by engineering firms during detailed design and engineering work, with Schneider Electric’s Engineering Workbench, used to configure the company’s process automation systems.

Design data is extracted from the SPI database and used to automatically generate control code on the fly, explained

Stephen Gray, director, global engineering management, Schneider Electric. “Our Engineering Workbench environment binds together pre-validated templates, rules and SPI data to automatically produce consistent control and safety configurations, cabinet documentation and instrument loop diagrams,” Gray said.

“Further, the integration goes both ways,” Gray said. “We bring validation and change management to client data.” Then, if additional changes are made to the process design, those changes are automatically propagated through the Engineering Workbench to the control system design. Control system code is always and automatically in synch with the designers’ latest thinking.

“Automating these processes allows engineers to focus on more complex tasks,” Gray said. “We want to take all that risk out of the equation.”



[Keith Larson](#) is group publisher responsible for Putman Media's manufacturing automation titles [Control](#), [Control Design](#) and [Smart Industry](#). Corporately, he also serves as vice president of content across Putman Media's other magazine titles.

HOW IIoT CAN AID ASSETS FOR CAPEX AND OPEX SAVINGS

Schneider Electric’s Industrial Internet of Things (IIoT) expertise shows users path to crucial efficiencies and savings.

By Paul Studebaker, editor in chief, *Control*

Coping with low and volatile oil and gas prices is a devilishly difficult problem, but efficient asset management assisted by new Internet of Things (IoT) tools can be a powerful ally in solving it. Luckily, Schneider Electric knows plenty about both.

“I come from Schneider Electric’s software business focusing on asset management, and while this isn’t process control, it does affect reliability,” said Justin Thomas, business development manager at Schneider Electric. “Sensors and their data in historians and other components

that can be enabled by IIoT are already out there, and all of this existing technology can be leveraged to increase reliability, reduce maintenance costs, and improve profits.”

Thomas presented “Enterprise Asset Performance Management: Harnessing the Power of IoT for OPEX and CAPEX Savings” as part of the Downstream Oil & Gas Track on the first day of Schneider Electric’s CONNECT 2016 Automation Conference this week in New Orleans.

“Traditionally, preventive maintenance has been done on time-based schedules, and though this has gotten

“There are big benefits to the predictive analytics, including overall savings of 1-2% in operations costs,” said Justin Thomas, business development manager, Schneider Electric spoke at Schneider Electric’s CONNECT 2016 Automation Conference this week in New Orleans.

better with more timely data and performance reports, truly predictive maintenance has remained limited,” said Thomas. “Though most users have some kind of asset management system, many aren’t doing this kind of technical analysis yet, even though they want better data for maintaining their assets. Studies by ARC Advisory Group find that only 18% of asset failures are age-related, while 82% are due to random failures. This means preventive maintenance provides a benefit for just 18% of assets, while monitoring for predictive maintenance is recommended for the rest.

“Schneider Electric is the only provider of a fully integrated, end-to-end, comprehensive Enterprise Asset Performance Management (APM) solution that goes from sensing to visualization to recording to tracking, and plugs in models based on what equipment users already have in place. This enables our customers to exceed safety, reliability and performance goals through data collection, storage and analysis, which is coupled with actions and optimization for proactive maintenance execution. The result is improved workforce efficiency and decision-making; increased asset reliability and availability; and maximized economic return on industrial assets.”

Thomas adds that users can also migrate to a more condition-based approach for maintenance by using Schneider Electric’s Avantis Condition Manager software and/or its Avantis PRiSM Predictive Asset Analytics software with machine learning functions.

“Avantis Condition Manager automates the maintenance process by monitoring user-defined rules that initiate necessary maintenance activities,” explained Thomas. “When conditions are known and definable, it uses rule-based logic. Maintenance rules are fixed and don’t significantly change based on equipment loading, ambient or operational conditions. Avantis Condition Monitor also intelligently integrates plant process data with EAM systems. Typical users are maintenance managers, who



needs a condition monitors (rules engine) to feed into their work-order management system.

“Meanwhile, Avantis PRiSM performs software-based modeling of equipment using advanced pattern recognition, and uses historical data to describe how a piece of equipment normally operates to build a model. Next, it continuously monitors behavior in real time, and provides alerts when the operation differs from the historical norm. It also delivers early-warning detection of equipment problems, as well as advanced analysis capabilities, including problem identification and root-cause analyses. Using current data, it also examines how all parameters of a system work together to affect asset performance, which allows users to analyze combinations of related events.”

Thomas added that Avantis PRiSM core tools include:

- Early-warning event detection and management (alarm manager), which detects any changes in existing assets, identifies anomalies, and delivers alerts about them.
- Trend analysis that indicates what causes are contributing to the anomaly.
- Diagnostics advisor (fault diagnostics) that identifies likely causes of anomalies, indicates how far they are from normal performance, and shows their likely sources, including a confidence percentage.

- Case management that documents and tracks anomalies, then stores them in a library. Tracking is also possible using financial metrics.
- Reporting to allow distribution of information about anomalies and other issues across all of a user's staff and components. This tool also has a dialog box that allows all team members to see what's happening, and discuss what to do about it.

"Most users only look at alarms, but they don't see these situations develop," added Thomas. "When users add predictive analytics, they can see the beginnings of deviations, and address formerly unplanned outages before they can occur."

For example, a company recently started one of its units after an outage; used Avantis PRiSM to find a vibration step-change on a LP turbine; notified its engineers and plant; collected vibration data and retired the unit for inspection; and discovered broken bolts on the lower half of the flow sleeve that were causing the sleeve to contact the L-O blades. "The upper half of the flow sleeve was no lon-

ger supported by lower half, and so finding this avoided damage to multiple stages of the blades, packing and diaphragms," added Thomas. "This avoided initial costs of \$4.1 million, and total avoided costs estimated at \$18 million during 2015."

Likewise, at Southern Co., PRiSM indicated an increase in vibration on multiple bearings. Its staff found a BFP coupling shim pack that was on the verge of failure, which saved about \$260,000 immediately, and resulted in an estimated \$4.5 million in avoided costs in 2015.

"PRiSM also reduces unexpected maintenance, maintains data quality reliability, and enables web alarm management," says Thomas. "There are big benefits to the predictive analytics, including overall savings of 1-2% in operations costs. If you have unplanned outages, there's a reason for them, but there's another way to reduce them by taking advantage of data you already have. These tools can achieve catches from \$10,000 to \$50 million, and just imagine if you were on the team that finds them."



[Paul Studebaker](#) is chief editor of [Control](#). He earned a master's degree in metallurgical engineering and gathered 12 years of experience in manufacturing before becoming an award-winning writer and editor for publications including [Control](#) and [Plant Services](#).

10 STRATEGIES FOR CYBERSECURITY SUCCESS

Secure operations require aggressiveness on par with the hackers trying to get in.

By Jim Montague, executive editor, *Control*

Effective cybersecurity protection is like many human endeavors that are more about journey than endpoint. It needs effort and persistence as well as a different attitude and mindset, mainly because the threat landscape is always shifting and changing.

"What do marriage, children, the taxman and cybersecurity all have in common?" asked Gary Williams, senior director of technology and cybersecurity at Schneider Electric in his keynote address to the CONNECT 2016 conference this week in New Orleans. "You'll never satisfy their demands, which evolve dynamically, and never end."

“Cybersecurity is everyone’s responsibility, and so we all have to be as aggressive as the hackers, or we’ll lose productivity.” Gary Williams, senior director of technology and cybersecurity at Schneider Electric, on the ongoing vigilance required to secure operations from constantly evolving threats.

Because cybersecurity isn’t a project that can be completed, Williams has two primary strategies for handling it—his 10-step AGGRESSIVE cybersecurity methodology, supplemented by a zones and conduits program. “Cybersecurity is everyone’s responsibility, and so we all have to be as aggressive as the hackers, or we’ll lose productivity,” said Williams.

10 AGGRESSIVE protections

10 strategies for cybersecurity success

The 10 steps in Williams’ cybersecurity recommendations are:

Adopt a standard to give participants a common vocabulary about cybersecurity between departments, companies and even nations. Schneider Electric and others have adopted the IEC 62443 standard. “This overcomes the first cybersecurity hurdle because many players say parts of their organization’s cybersecurity efforts don’t apply to them, and so they stop, and their programs fail,” said Williams.

Gather controls means collecting and accounting for all the components of your controls and workload.

Gap analyses involve checking for vulnerabilities in existing equipment, systems and software, especially undocumented ports and network connections. “You have to find all the dirty laundry,” added Williams.

Risk and threat assessment—and prioritization—goes beyond mitigating critical threats, and includes reviewing the security status of all critical priorities every quarter. “There are now 700,000 new malwares out there everyday, and most are delivered in PDF documents,” stated Williams.

Execute mitigation begins with putting cybersecurity protections in place, but Williams adds that senior managers must be notified of how cybersecurity programs are progressing. “You have to record findings because at some point you’re going to have to go and ask for more funding,” explained Williams.

Survey the complete system involves collecting configuration files on firewalls and switches. This information

will be essential when a process control system or network goes down due to an intrusion or attack.

Store configuration files securely onsite and offsite, and then practice recovery as often as possible.

Inform all stakeholders, especially management. “Again, you have to tell them what you’ve learned about cybersecurity threats to your production processes and organization, so they will see the value in protection and mitigation,” said Williams. “You must also show how threats evolve, and more support will be granted.”

Verify on a regular basis because threats and their vectors change regularly. “Get regular ‘cold-eyes’ reviews of your cybersecurity efforts. Another party can see more and prove to be more aware of what needs to be done,” added Williams.

Educate everyone because people are the first line of defense in isolating process applications, controls and networks, and then identifying probes, intrusions and attacks. “After that, you call the experts to mitigate the security problem,” he added.

Zones and conduits

Beyond his 10 strategies for cybersecurity, Williams also advocates the well-known zones and conduits model for secure industrial operations and networking. This model has been part of the ISA99 standard, which was recently renamed to join with IEC 62443.



"The zones and conduits approach begins by segregating your controls and communications networks into functional zones, and creating demilitarized zones (DMZs) between them," explained Williams. "You pull like devices into common zones, and then you can concentrate on protecting the conduit between them."

Though there are often sub-zones within larger zones, the five main layers separated by managed Ethernet switches serving as firewalls include Layer 1 for field instrumentation; Layer 2 for basic process control; Layer 3 for site manufacturing operations; Layer 4 for site business planning; and Layer 5 for the enterprise. Safety-critical devices and systems are typically located in another separate zone.

"Breaking down networks and their traffic is difficult, but users that do it are grateful because they say they learned things about their applications and networks that they never knew before," added Williams. "For example, we had one user who couldn't find the source of 2.4-GB wireless activity in its offshore platforms, and finally found it was due to HP printers that came with Bluetooth switched on by default."

"You have to be aware of your components and their effects. It's a sleepless task, but it can also boost your career," Williams said. "So, identify all your network assets, protect your conduits, and mitigate threats with help from the experts because the standards can't keep up with all the changes."



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DESIGN ALARMS AND HMI FOR SMOOTH OPERATIONS

Standards are necessary, but not sufficient to achieve best practices and situational awareness.

By Paul Studebaker, editor in chief, *Control*

The control system human-machine interface (HMI) has come a long way, from the banks of dials and meters of the 1960s through the full-color, three-dimensional moving graphics of the 1990s to today's human factors engineering-based rules to support situational awareness. Those rules have been encoded in standards and embedded in software libraries and style guides so HMI developers no longer need to invent their own. But it's not always clear how to use them.

"Whether they're from the ISA, ISO or API, industrial standards are consensus minimums," said Bridget Fitzpatrick, management and human factors practice

lead, Wood Group Mustang, to attendees of her session, "HMI and Alarm Management" at the Schneider Electric CONNECT 2016 event this week in New Orleans. "The hardest thing for an engineer is writing about the bare minimum, beating the best practices out of the standards."

Fitzpatrick is active in ISA18 (alarm management) and ISA101 (HMI) standards and practices committees, and is managing director (ISA18 committee) on the ISA Standards and Practices Board. "A committee may have 200 people, and the result is standards that are not perfect, not best practices, but a good starting point," she said. "They let you set a framework for

“We need to design HMI to support operators through the whole range, from best operation through ‘The ESD failed and everything is on fire.’” Bridget Fitzpatrick, management and human factors practice lead, Wood Group Mustang, at the Schneider Electric CONNECT 2016 event this week in New Orleans.

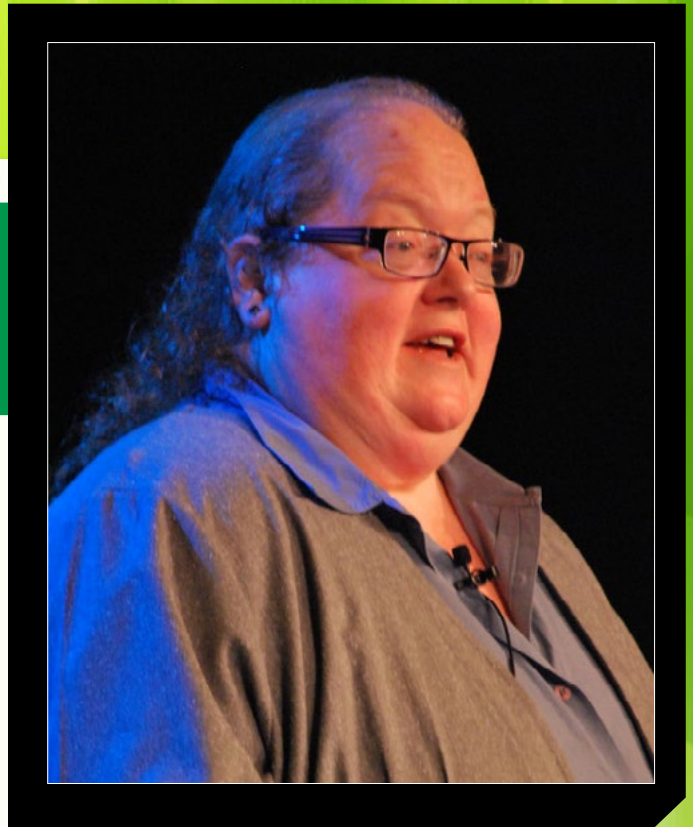
managing scope and keep you out of trouble. The standards committees also offer recommended practices and technical reports, and these can lead you to best practices.”

The alarm management standard ISA18.2 was published in 2009, and became the basis for the international standard IEC 62682 in 2015. “There is a new version of 18.2 in 2016 as a five-year revalidation, and we have a number of technical reports coming this year from the working groups,” Fitzpatrick said. Evolving requirements for control systems have resulted in new functionality, including shelving and designed suppression in many systems.

In 2017, IEC 62682 maintenance will begin. “All the differences between ANSI/ISA18.2-2016 and IEC 62682-2014 will be submitted as comments as we endeavor to keep the two standards, managed through two different organizations, closely aligned,” she said. Meanwhile, the ISA18.2 committee is working on a technical report on packaged systems alarms and evaluating a technical report on events and alerts, “conditions that do not make the cut as alarms,” she added. EEMUA’s third edition includes the alarm management lifecycle from ISA18-2, so there is global convergence on alarm management.

In the plant, alarm management should “start with a philosophy,” Fitzpatrick said. “Everybody has an opinion. Have the discussion, have the arguments and write that philosophy.” Set good guidelines to reduce the time required, and define work practices so things go smoothly. Run tests to find and remove nuisance alarms, and demo the alarms to show how they work. “Check that alarms get the response you want, that you have a system that’s used and alarms are not ignored,” she said. In the end, remember: “Operations owns alarm management—it’s an operations tool.”

To be sure the system is effective, “Have periodic ‘cold-eyes’ audits by someone who is not involved,”



Fitzpatrick added. “A good alarm system will give you better interaction with government inspectors and insurers, and may help reduce your rates. And a calm, well-ordered workplace will help you attract and keep skilled operators.”

HMI needs its own set of rules

“Having system standards for HMI is an important step that many people miss,” Fitzpatrick said. “Have a written philosophy, and a style guide.” ISA101 is the lifecycle standard, and the ISA101 committee currently has three working groups: WG1 is writing a technical report on philosophy and style guides; WG2 is writing on usability and performance, and WG3 is writing on mobile devices. “API 1165 has wonderful words, but really bad pictures. It’s being revised for 2017,” she said.

“It’s good to remember that field control has evolved to help us make things faster and better. We want stability and extended times between shutdowns,” Fitzpatrick said. “We need to design HMI to support operators through the whole range, from best operation through ‘The ESD failed and everything is on fire.’”

Consider what the operator needs, which is what is useful. “The ability to do stupid computer tricks is a lever, but it has to be used to help us be agile and com-

petitive, to help the operator be the manager of the process,” Fitzpatrick said.

“An HMI starts as a blank canvas—you can draw anything you like. And that’s not necessarily a good thing,” added Grant Le Sueur, senior director, offer management, Schneider Electric. The company partnered with Acuity and references ASM style guidelines to produce standard symbol libraries users can draw on to create consistent, compliant HMIs. Instead of hundreds of versions of a common element (such as a valve with different options in various positions), a single symbol can be configured and used in all HMIs across a facility or around the world. A change to a particular symbol can be propagated to all its instances.

Style guides that govern placement and colors also provide consistency, as well as programming support for situational awareness, where operators can see at a glance how the plant is behaving, and drill down into any abnormalities. (For more information, see the white paper, “Situational Awareness and Control HMI for Operators” here).

Individual companies such as Shell or ExxonMobil can customize their libraries and create their own styles, use them across all their sites and share them so EPCs and SIs can supply compliant projects, making engineers more efficient and saving the cost of creating separate specifications and documentation.

Operators can move from unit to unit or relocate to another plant without retraining, and maintain the response speed, safety and efficiency that comes with reflexive understanding of what the HMI is telling them, and how to react.

Make your style guide into a living document. “Don’t use it once for the initial design and then ignore it through the lifecycle,” said Fitzpatrick. “If you make an exception, go back and write it into the rules.”

The proof is in the plant

It’s valuable to be on good terms with your operators. “Have a relationship where they’ll tell you if something doesn’t work,” Fitzpatrick said. “It’s painful to throw away something you created, that you put a lot of work into, but, if it’s wrong, it has to go.”

Give them what they need. “If they have a variance in how you do something that matters, put it in the HMI,” she said. “Give them real-time support.” During an emergency, this is not, “Read the procedures.” If recovering from a utility loss means running around figuring out lineups, get them into the system. If you have expert systems, integrate them so operations can learn in real time.

A well-designed HMI can work wonders. “For a while, my responsibilities included energy optimization of a steam system, and my salary depended on the energy savings,” Fitzpatrick said. “I put consumption in the corner of the screen in real-time dollars to highlight wasteful practices, and the shifts started to compete to see who could use the least energy. I made money, but the operators took over and my position was eliminated.”

In another case, the procedure for trip check on a boiler was not being followed. “It needed to be done perfectly, so I automated it,” she said.

In the extreme case, for upset operations, “it’s important for operators to know the normal operating envelope and be able to immediately understand the cause and effect of a failure so they can address it,” Fitzpatrick said. “Visually highlight what didn’t work, and why. Think about catastrophic loss—an ESD failure—and what the operators need to know to minimize consequences or even to save their lives. Tell them when to leave, and which way to run.”



Paul Studebaker is chief editor of *Control*. He earned a master’s degree in metallurgical engineering and gathered 12 years of experience in manufacturing before becoming an award-winning writer and editor for publications including *Control* and *Plant Services*.

LIFECYCLE THE FOCUS OF FOXBORO ROADMAP

The Schneider Electric brand's roadmap promises prioritized strengths and a new level of lifecycle certainty.

By Paul Studebaker, editor in chief, *Control*

Schneider Electric offer managers faced an eager crowd of customers at their session describing the Foxboro brand's roadmap for the next few years at the company's CONNECT 2016 conference this week in New Orleans. Product line developments in I/O, integration, controllers, networks and applications are designed to support today's plant priorities: connectivity, reliability, efficiency, sustainability and services.

"The roadmap is designed to help plants achieve future-proof operations and lower total cost of ownership over 20 years or more," said Alain Ginguene, director, offer management, Foxboro, Schneider Electric. "We want it to be easy to integrate products; get your networks implemented and above all, secure; reduce engineering complexity and simplify maintenance over the product lifecycle."

I/O developments include adding redundancy to Intelligent Marshalling. The new FBM248 offering now includes redundancy capabilities and is 100% software configurable to support the company's FLEX project execution methodology, which minimizes risk on delivery and reduces spare-parts requirements. Release continues on Compact 200 Series modules, which offer the same reliability and 50% smaller footprint than the regular 200 Series. "All 200 Series now receive conformal coating," said Ginguene, making them more suitable in harsh environments such as offshore platforms.

Advances in integration include the company's Unified Control and Safety offering. The hardware fits on a Tricon chassis, and the software allows users to configure safety PLC blocks that are generated automatically by the sys-

tem, with the option to display some or all tags, and built-in change management. "It can be used with Tricon, Trident, and TriGP," Ginguene said. "The software is independent of the hardware." Also, a new Unified Modicon Configuration/Unity Pro experience allows "enter only once" for configuration and system management.

Intelligent Power and Motor Control Center (iPMCC) integration allows motor drives, starters, protection and power management to be integrated within the Foxboro Evo DCS. Easy integration drives energy management with control and HMI templates, now implementing complex functionality and industry-specific applications.

Field Device Controller FDC280 allows a large amount of integrated data and multiple communication protocols in a compact format. Available in two to three



"The roadmap is designed to help plants achieve future-proof operations and lower total cost of ownership." Alain Ginguene, director, offer management, Foxboro, Schneider Electric presented the Foxboro roadmap at CONNECT 2016 this week in New Orleans.

months for Modbus TCP, more protocols will continue to be added over time so one box can handle five or 10 versions of protocols. Putting control and communication in one box to serve data to the central processor (CP) simplifies connection to protocols such as RS-485, and minimizes footprints in the field.

In the controller category, the next generation will be an embedded multivariable controller, the MVC 280 due in 2017. This will be followed by a number of software additions and updates to the FCP280 in mid 2018.

Networks and security

In mid-2016, Magelis industrial workstations and servers will be qualified for use with Foxboro Evo in harsh environments, 24/7 operation, reduced space requirements and increased physical security applications, with extended lifecycles for both hardware and software. Ginguene said, "Where a PC might last two to five years, with these machines, life is doubled." Also, new Ethernet switches are being qualified for use with Foxboro Evo.

Last year, the FCP280 Field Control Processor received ISA Secure EDSA certification, and development centers in Foxboro, Mass.; Worthing, UK; and Hyderabad, India received ISASecure Security Development Lifecycle Assurance (SDLA) certification. "Now we're working on ISASecure System Security Assurance (SSA) certification," Ginguene said. "A supplier may apply for SSA and SDLA in parallel, and we did SDLA first."

A new Control Network Interface serves as a bridge to connect systems or segments into independent, but linked, systems with security. This allows maintenance flexibility and transparency across units while keeping them independent for robustness.

Applications and software

Situational awareness graphics and libraries support pattern recognition, reserve specific colors for abnormal situations, and provide minimal visual distraction with low-contrast graphics. "When you do an upgrade,

where's the value?" asked Ginguene. "This new type of HMI makes operators more efficient, and improves plant performance and uptime."

System Auditor (formerly Foxray) centrally documents Foxboro systems of all ages and styles, and supports alarm management and shelving. The ability to detect, interrogate, configure, enable and document (DICED) smart field devices automatically takes care of "a lot of work you don't have to do manually," Ginguene added.

Maintenance Response Center is a decision-support application—a dashboard to gather field device alerts and alarms, and to help maintenance people do their daily job. Laptop, tablet and smartphone support give them "all the information they need to identify the type of problem and whether it's critical or not," Ginguene said.

Windows 10/Server 2016 is the next OS platform from Microsoft. Ginguene said, "Its adoption, coming in mid-2017, will extend lifetimes, allow Windows 7 and 10 in the same system, and provide security for the mobile workforce."

Defining product status and lifetime

Mike Chmielewski, vice president, offer management, said Schneider Electric will be quantifying each product's status and lifetime. Products currently move from "preferred" phase when new through "available," "mature," "lifetime" and ultimately "obsolete" phases on an undefined timeline. "Not forecasting future stages has caused a lot of angst, so now we will be specific and publish guidelines for hardware and software lifecycles." Chmielewski showed anticipated product life guidelines ranging from 30 years for I/O and 15 years for controllers to 10 years for networking equipment, eight for servers and five for a version of software.

"These are only guidelines," Chmielewski added, but now, instead of leaving both customers and Schneider Electric representatives uneasy about the anticipated life of a product they're specifying for a project or update, "We can automatically generate installed base reports for a facility, sit down and talk, and make a plan, not a panic. We can be proactive, predictive and collaborative."



[Paul Studebaker](#) is chief editor of [Control](#). He earned a master's degree in metallurgical engineering and gathered 12 years of experience in manufacturing before becoming an award-winning writer and editor for publications including [Control](#) and [Plant Services](#).

OUT-OF-BOX SOLUTIONS FOR REMOTE SCADA USERS

Schneider Electric takes the high road to security and solution-based offerings.

By Mike Bacidore, editor in chief, *Control Design*

Remote SCADA enables monitoring and control of processes over a wide-area infrastructure. From measurement sensing to equipment optimization and reporting, these systems often require application-specific features. The only thing changing as fast as the technology and end-user industry conditions is the array of standards and user requirements that ensure optimal performance and reduce risk.

“One of the big initiatives for the portfolio is to provide a timely and assured approach to Cybersecurity. This is particularly relevant to SCADA but something that can be well handled by the incorporation of the new Embedded Device Security Assessment (EDSA) which requires that Secure Practices, Processes and Proof are built into our RTUs from the ground up,” explained Chris Smith, brand director, Foxboro SCADA, industry business, at Schneider Electric, who spoke at CONNECT 2016 this week in New Orleans.”

“One of the most important developments is for the Foxboro SCD6000 product,” said Smith. “We built in DNP3 Secure Authentication v5. It’s an interesting protocol because end users can evolve whole SCADA systems to a more secure arrangement progressively as overall security is assessed. It enables customers control systems to authorize all remote controls handled by the secure SCD6000 You check to make sure the controller you’re sending to is the right one by way of key exchange. You’re verifying it’s the right secured device and it’s authorized before you send the control. We’re leading the way with that. Some of the

other RTU products in our portfolio will start to benefit from this in coming years.”

Most of Schneider Electric’s SCADA solutions have been in the market for decades, explained Helenio Gilabert, director, Telemetry & SCADA Solutions, process automation, industry business. “The portfolio has had a very long history through different countries, from Australia to Italy and Canada.”

The portfolio includes SCADAPack remote terminal units (RTUs) used mostly in water/wastewater and oil & gas applications in the United States, Canada and Australia; Trio radios, specifically designed for long-range and low-bandwidth telemetry, but respectful of data integrity; the SCD line of RTUs from the legacy Invensys portfolio, including SCD2200 modular RTU for oil & gas pipelines and SCD5200 and SCD6000 for the industrial power space; and the Accutech wireless sensor network.

“We have Foxboro Evo SCADA as our platform of choice when deployed with DCS,” explained Gila-

“One of the big initiatives for the oil & gas industry is to get a more standards-based cybersecurity position.” Schneider Electric’s Chris Smith explains where remote SCADA is headed at CONNECT 2016.



bert. “It’s the same architecture, so it integrates very well. When we’re talking about field applications our platform is ClearSCADA.”

Industry-specific solutions

Schneider Electric has combined core products from its portfolio and written software to create solutions for specific industry problems. “We develop the solutions with customers,” explained Gilabert. “When the customer comes to us and says it has a need, we work with them to develop it.”

Two solutions for the oil & gas industry, RealFlo and RealLift, already are available; a new water/wastewater solution, RealStream, will be available in 2017.

“RealFlo calculates volume, gas, water and emulsion,” explained Gilabert. “RealLift manages and optimizes hydraulic pumps and progressive cavity pumps in the field for oil & gas. This brings many existing products together, including Magelis HMI, Altivar drives and SCADAPack, which is where the logic runs.”

RealStream is a lift-station automation solution for wastewater. “You need to pump the water from tank to tank to get to the pumping station,” said Gilabert. “We’re bringing in the newest technology from our HMI group. We’re integrating the Altivar drive HMI technology.”

Who’s driving this road?

The primary driver of remote SCADA solutions is the need to optimize operations and reduce costs. “If you

look at oil & gas, it has become extremely efficient at drilling,” explained Gilabert. “It’s reduced the cost and the time to drill by half. Now they’re under extreme pressure to become efficient in the operation of the well. It’s put a focus on the impact technology can have to optimize operations. That’s why we’re building intelligent controllers and out-of-the-box solutions. They just want to buy it, install it and have it work.”

The other driver is the expanding lack of skilled workers from the oil & gas industry. “Everyone is focusing on survival now, but oil & gas will bounce back. They’re concentrating on capturing the process knowledge and automating it in the field,” said Gilabert.

“We’re moving to solutions-based offerings because there are fewer engineering hours required,” explained Gilabert. “We’re removing that integrate-and-develop time and going directly to install. Engineering time goes down, but operations time also goes down.”

Operating by exception, which is unmanned operation, unless an issue develops, is enabled by technology. “It also influences safety because, the less you’re in the field, the fewer chances for accidents there are,” said Gilabert.

In 2017, Schneider Electric also plans to release SCADAPack 1070, combining the capabilities of modular and redundant RTUs with the form factor of a programmable logic controller (PLC).



Mike Bacidore is the editor in chief for [Control Design](#) magazine. He is an award-winning columnist, earning a Gold Regional Award and a Silver National Award from the American Society of Business Publication Editors. Email him at mbacidore@putman.net.

TRICONEX FORGES PROCESS SAFETY'S FUTURE

New hardware, software and platform enhancements improve safety performance while boosting engineering productivity.

By Jim Montague, executive editor, *Control*

One of the best ways to build a useful, successful future is on the foundation of a useful, successful past. And Schneider Electric's Triconex safety business, together with its legendary Tricon products, is one of industry's best examples of this phenomenon at work. All this comes as no surprise to Triconex's users, integrators and developers who convened their 26th annual Triconex Users Group (TUG) meeting at this week's Schneider Electric CONNECT 2016 conference in New Orleans.

Chris Stogner, brand director of Triconex Safety, began the session by reiterating the organization's commitment to extending the safety instrumented system (SIS) lifecycle and to continuing to enhance the Tricon platform. More recently, Stogner said, Schneider Electric has made this mission part of the company's Safety for Life program, which combines its safety products and services with a rededication to trust, value and commitment.

"Safety for Life is a program to bring process automation safety offerings together to maximize safety and minimize security risks," said Stogner.

Tricon Version 11

Chief among Triconex's recent advances are the release of Tricon Version 11, which consists of enhancements to its platform, hardware and software. These include the new Tricon MP3009 main processor, 8210E high-speed chassis and unified communications module. The company also has increased peer-to-peer networking capabilities to 254 nodes; reduced

"download-all" requirements; achieved ISASecure compliance; enabled project file download and upload from controllers; as well as enabled the online upgrade of main processors.

"When using the MP3009 together with the 8210E enables 2.5 times faster cycle times, while TÜV has issued the world's first combined Safety and Security certificate," reported Stogner. "This means we have IEC 62443-compliant security embedded in our products, and this security has been proven resilient against tested attacks. These and our other enhancements such as online upgrades help expand SIS in



"Our customers' values drive the Triconex roadmap." Schneider Electric's Chris Stogner reviewed the latest enhancements and future plans for the company's Triconex safety platform.

place without plant interruption, and future-proof Triconex investments for users.”

TriStation, Diagnostic Monitor, Report Generator

The next set of advances discussed by Stogner are to the company’s TriStation and Enhanced Diagnostic Monitor, which are intended to fuel engineering and maintenance productivity. New features include support for the new Tricon CX platform; support for new I/O modules; automatic monitoring of loop performance and characteristics; new tabular layouts that simplify configuration and data management; and new search and filter capabilities.

“The latest version of TriStation has Excel-like functions that enhance ease of use and productivity,” said Stogner. “Overall, these improvements maximize engineering and maintenance efficiency, and further future-proof Tricon.”

To simplify peer-to-peer tag management, Triconex Report Generator delivers function block usage, configuration reports and tag name cross-reference reports, and is supported by TS1131 V4.13 onward. Its benefits include more efficient management of peer-to-peer safety networks as well as simplified documentation, reporting and analysis of SIS logic and configurations for management of change (MOC).

Safety View 1.1

Because it’s a TÜV-certified alarm and bypass human machine interface (HMI), Safety View 1.1 software allows users to manage priority alarms with confidence, Stogner continued. Its capabilities include a new, flexible HMI designer for constructing safety-related HMI elements; new HMI functions for alarm process values, bypass area, multi-view faceplates; global acknowledge and emergency shutdown functions; status for health and alarm block for link health; and TSAA protocol configuration.

“Safety View 1.1 is more reliable, more space efficient than annunciator panels, and provides increased situational awareness to prevent alarms from going unnoticed or left in bypass inadvertently,” explained Stogner. “All of this maximizes operators’ awareness, and enables effective and efficient bypass management.”

SIF Manager

To ensure that the safety instrumented functions (SIF) that users rely on will operate when needed, SIF Manager software validates SIF performance in real time. Besides SIF performance validation, its features include detailed trip reports, sequence-of-event and email alerts; proof-test tracking and history; bypass tracking and email alerts; and management of proof-test credits. These functions reduce manual activities and data handling, as well as human errors.

Safety Validator

To make logic testing easier, more efficient and effective, Safety Validator software can perform logic testing as the press of a button. It can create tests in a structured environment; can execute tests against a Tricon controller or TriStation emulator; includes auto-run, single-step and select test cases; displays automated test results; has an option for entering manual tests and showing pass/fail results; and can repeat and rerun tests.

“Safety Validator is a world’s first solution because, instead of providing results in a Word document that must be re-entered, users can just hit ‘play’ and have it done for them,” said Stogner. “This minimizes the time, cost and effort of testing safety application logic, and increases test quality, while reducing human errors.”

Stogner added that Triconex is also working with partner ae Solutions to integrate functions from its ae Shield software. This effort will allow the software to pull in more data automatically, auto-generate SIS content, perform function tests, and auto-update documents.

On the roadmap

“Our customers’ values drive the Triconex roadmap,” Stogner added, before providing a glimpse further into the future of the Triconex technology roadmap. “Some feedback is consistent, such as the need for greater safety from random threats, increased availability, and security from non-random threats. Most users are also facing fewer resources and staff for engineering and maintaining SIS operations, while they must also reduce total cost of ownership, and handle faster SIS start-up schedules.”

Some of Triconex’s other ongoing and planned launches in 2016 and early 2017 include:

Tricon CX main chassis 8120X, which is designed for panel mounting or 19-in mounting, so no special racks, swing frames or rear access are required. It includes three main processor slots, four communication slots, copper and SFP (small form pluggable) connections with no remote I/O chassis required.

Tricon CX I/O chassis 8131X, is also designed for panel mounting or 19-in mounting and includes supervised digital input with 1-ms sequence of events resolution; supervised digital output; analog input with 5-ms update; and analog input with HART. Six configurable I/O slots, as well as various field-wiring options provide for maximum flexibility.

Fault-Tolerant I/O Bus will support both Tricon and Tricon CX systems, allowing up to 15 I/O chassis on an RS-485 bus, and will be completely interoperable with existing Tricon systems.

Fault-Tolerant Ethernet I/O Bus also will connect to both Tricon and Tricon CX systems and support up to 31 I/O chassis on Ethernet I/O bus as well as simultaneous support of serial I/O bus.

Tricon Version 11.4, the second release of Tricon CX, will support Ethernet I/O Bus with 1-GB communication speed; analog output with embedded HART; up to 31 I/O expansion chassis and 186 I/O modules; 5,920 I/O per controller set; and Universal Safety I/O.



Jim Montague is executive editor at *Control* and *Control Design* magazines. Jim has spent the last 13 years as an editor and brings a wealth of automation and controls knowledge to the position. For the past eight years, Jim worked at Reed Business Information as news editor for *Control Engineering* magazine. Jim has a BA in English from Carleton College in Northfield, Minn., and lives in Skokie, Ill.

REDUNDANT PACS BOLSTER PLANTSTRUXURE PES

PlantStruxure PES provides programming and control of smart, connected devices.

By Mike Bacidore, editor in chief, *Control Design*

The Internet of Things is not new. “We’ve been talking about IIoT for the past 10 years,” said José Bonomo, vice president, offer management—hybrid systems, Schneider Electric. “There’s a growing demand for smart, connected products and an opportunity to drive operational efficiency with industrial software.”

Bonomo and Erhard Bartl, PlantStruxure roadmap director, delivered an update on the integration of the Modicon PAC series controllers into its PlantStruxure PES architecture, and how it impacts the ability of integrators and users to program, control and enable secure IIoT initiatives at Schneider Electric’s CONNECT 2016 conference this week in New Orleans.

“We see IIoT as an evolution, not a revolution,” explained Bonomo. “We started this journey a long time ago with intelligent architecture. We have the opportunity to mix power and process in the same architecture. System integrators and process OEMs want to adopt standards to reduce risks. End users want to increase efficiency, operations and profit.” The new PlantStruxure PES version is designed to meet all of these needs.

“We are always looking to satisfy our customers—the end users who run the plants, but also those who put these processes in place, meaning the system integrators and the process OEMs,” explained Bartl. “PlantStruxure PES provides users with greater information transparency, ef-

“The architecture needs to transform to something flatter, where each device has the ability to make decisions and make changes in real time.” Schneider Electric’s José Bonomo explained how PlantStruxure PES is ready for the road ahead at CONNECT 2016.

iciency, redundancy and flexibility to make operations more efficient,” said Bartl. “It’s tested, validated and documented architecture to reduce risk.”

PlantStruxure PES V4.2 now integrates the company’s Modicon M580 ePAC family. Built for IIoT applications, the addition of Modicon M580 redundant controllers help to increase plant and asset availability. Today, 50% of PlantStruxure PES projects require at least one pair of redundant controllers within the configuration, said Bonomo. “PES V4.2 is designed to meet the next generation of requirements with the M580 ePAC.”

PlantStruxure PES V4.2 now includes the full range of Modicon M340 and M580 PACs, Modicon Premium and Quantum PLCs, X80 I/O and STB distributed I/O, as well as available tools and libraries. Further, it is equipped with ready-to-use application and industry libraries, allowing systems to be built more quickly and with lower engineering costs. And by integrating energy-management features from other Schneider Electric automation and power devices, such as Altivar drives, the system will help users realize higher energy cost savings.

“PlantStruxure PES is built utilizing Modicon controllers,” explained Bartl. “It has libraries, object models, navigation services for maintenance and energy-consumption measurement and management.”

To simplify, protect and optimize

“We’ve seen the trends, and our strategy is to demonstrate the value of automation under three domains—simplify, protect and optimize,” said Bonomo. “We are putting a lot of effort into simplifying our offers. We have launched a builder across the entire lifecycle. We want to bring simplification to you as an end user, process OEM or system integrator. Then we want to protect our customers’ investments,



and we want to help customers to make the most effective use of their investments, to optimize.”

One of the major drivers in designing the PlantStruxure roadmap was simplification of architecture management, added Bartl. “You design, configure, program and deploy, and then it can monitor to enable diagnosing and repair. This is lifecycle-oriented architecture management.”

The road ahead

“In 1990, automation architecture was very vertical,” said Bonomo. “Profit reporting was based on historical data. By 2020, the world will have changed. You will need to make changes and make business decisions faster. The architecture needs to transform to something flatter, where each device has the ability to make the decision and make changes in real time and not rely on an additional layer. This means improved real-time safety and security and control. We are merging the information and operational technology worlds, and we are making the architectures autonomous.”

“We are adding features to the Modicon M580 ePAC, moving toward a scalable, cybersecure platform,” explained Bartl. “We want to be able to connect to what the customer has already invested in. The range is from stand-alone to redundant. We can connect to the S908 remote I/O installed base.”



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PLANTSTRUXURE PES SECURELY ENABLED FOR THE IIoT

Integrated programming and PLC flexibility join forces in hybrid control platform.

By Mike Bacidore, editor in chief, *Control Design*

The convergence of IT and OT is real. Even at the programming-and-control level, Schneider Electric has taken the next step in combining the integrated programming environment of a DCS with the flexibility and scalability of a programmable-controller-based system, including an Ethernet-enabled controller that features cybersecure IIoT connectivity.

Schneider Electric's PlantStruxure PES V4.2 includes cybersecurity features to ensure system uptime. "As IT and OT converge, we need solutions that boost plant connectivity and security," said Chris Lyden, senior vice president of strategy, Schneider Electric's Process Automation business, who spoke at CONNECT 2016 this week in New Orleans.

"PlantStruxure PES enhances the ability of plant operators, engineers and managers to take better advantage of process and energy management data, which better enables them to improve maintenance, increase asset reliability and uncover additional operational efficiencies, all in a more secure environment. By making our PlantStruxure PES automation system secure and future-proof by design, we are meeting the needs of tomorrow's production facilities today."

PlantStruxure PES V4.2 integrates hardware with capabilities from the new Modicon M580 redundant ePAC's Ethernet-based architecture. Designed for IIoT applications, the Modicon M580 redundant controller makes plant and asset data available and transparent. Today, 50% of PlantStruxure PES projects require at least one pair of redundant controllers within the configuration, said José Bonomo, vice president, offer management-hybrid systems, Schneider Electric. PES V4.2 combines next-generation connectivity

requirements with the ability to lock down ports within a single configuration environment, Bonomo said.

New services will be available in PlantStruxure PES for engineering and commissioning, designed to make navigating a control program easier, as well as improve performance when making project changes.

Safe waters

"We were thinking of cybersecurity from the start," said Bonomo. "The M580 was first launched with cybersecurity designed inside. And M580 safety, available next year, will combine control and safety."



"As IT and OT converge, we need solutions that boost plant connectivity and security." Schneider Electric's Chris Lyden explains where hybrid control and the IIoT meet at CONNECT 2016.

PlantStruxure PES V4.2 is a modular offer. “You can choose what you need based on what you have installed,” explained Erhard Bartl, PlantStruxure roadmap director, Schneider Electric. “If you want to add something, it’s easier with this modular architecture. We are supporting all of the assets and bringing the information up from the sensor to the business level.”

Because so many Schneider Electric customers also are using the company’s Wonderware human-machine interface (HMI) software in their plants, PlantStruxure PES provides an opportunity to readily combine Wonderware and Modicon PACs, explained Bartl. “We have libraries that are ready to use based on Modicon controllers and Wonderware software,” he said. “It brings design speed. We are also integrating Wonderware technology as part of PES, so the customer can use the same technology.”

Legacy on the vine

“We see a huge amount of automation applications that are aging and will be migrating,” explained Bonomo.

“This is driving our roadmap on a day-to-day basis. The speed of business is increasing.” Energy costs in the United States can change every 15 minutes, he said. “In Spain, it’s every 5 minutes. We need an architecture that’s flexible enough to react to this.”

The IIoT goes a long way to address this. “There’s a need for intelligent assets,” proclaimed Bonomo. “When we meet with our customers, we talk about safety and security to make sure we are providing safety for life and providing cybersecurity. Everything we do fits with this.”

Hybrid control is a strategy to serve customer challenges. “Much of the success of the PlantStruxure PES process automation system is based on the value we provide for system integrators,” explained Bonomo. “Efficiency and innovation are available through Modicon controllers, libraries, navigation services and energy management. Business decisions are made at the control level because the architecture is flatter, merging IT and OT and allowing the management of risk, safety and profitability in real time.”



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REDUNDANCY, VERSATILITY ADDED TO UNIVERSAL I/O

New Intelligent Marshalling offerings improve flexibility, reliability and efficiency of control and safety system design and operations.

By Paul Studebaker, editor in chief, *Control*

For the past five years, users have enjoyed the capabilities of Intelligent Marshalling using programmable Foxboro Evo FBM247 Universal I/O for the full range of analog, discrete and digital signal applications: eliminating the costly and

labor-intensive marshalling process traditionally required for control systems and yielding faster implementation and startups, reduced engineering and spare parts inventory costs, and no trips to the field for configuration.

Introduced this week at Schneider Electric CONNECT 2016 in New Orleans, the Foxboro Evo FBM248 Universal I/O module brings the reliability of redundancy to Intelligent Marshalling. The standard 200 form factor is available now, with the Compact FBM248 coming at the end of the year.

Last August, the Compact FBM247 Intelligent Marshalling module was introduced, with the same benefits in half the cabinet space.

“Now, we are introducing redundancy with the FBM248, in addition to all the features of the FBM247,” said Thad Frost, technology manager, Control & I/O, Schneider Electric, at the company’s CONNECT 2016 event this week in New Orleans. The standard 200 form factor is available now, with the Compact FBM248 coming at the end of the year.

Safety systems also now get the benefits of Intelligent Marshalling with the introduction of the Tricon CX 3902X TMR universal I/O module. “It’s triple-modular-redundant, SIL-3 rated and available for the compact Tricon CX system,” Frost said.

Intelligent Marshalling removes the dependency between control and safety system design and the installation of I/O systems. The new Universal I/O offerings for Foxboro Evo and Triconex enable process automation professionals to seamlessly adapt to last-minute I/O design changes, and provide backup to eliminate the impact of any process downtime.

Being universal, Universal I/O modules are designed for limited current capacities, and do not have features required for some applications, such as fuses, power relays, knife disconnects, safety relays, intrinsic safety barriers, etc. To provide this flexibility, the Universal I/O modules work with a range of third-party interfaces that easily and flexibly add any of these capabilities to an I/O point via modules on a compact terminal assembly. Schneider Electric is working with MTL, Phoenix Contact and Pepperl+Fuchs to offer a wide variety of functionalities.



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Soon, Universal I/O will be available fully configured, installed and factory tested in a ready-to-go Intelligent Enclosure. “You’ll be able to order by quantity of Universal I/O, redundancy, intrinsic safety, safety and size, and end up with a standard part number,” Frost said. “This further decouples system design from I/O installation. You can ship and install now, and configure later.”

“Upgrading our award-winning Intelligent Marshalling solution to include redundancy and safety capabilities demonstrates our commitment to providing the connected solutions our customers need to improve the safety, reliability and efficiency of their plants and business operations,” said Chris Lyden, senior vice president of strategy, Process Automation, Schneider Electric.

“Configuring control and safety systems I/O can be costly, labor-intensive and subject to change,” Lyden said. “With their additional flexibility, the Foxboro FBM248 and Tricon CX 3902X I/O offerings allow our customers to adjust to unforeseen module changes and errors with little impact to installation time. That can drive huge savings when it comes to project execution and operations.”

APC CONQUERS LONG FLASH FURNACE LAG

Advanced process control (APC) pays off in higher yields, increases safety and uptime at Vale INCO smelter.

By Paul Studebaker, editor in chief, *Control*

The Vale INCO Copper Cliff Smelter in Sudbury, Ontario, Canada, sports the western hemisphere's tallest chimney (380 meters) as well as one of advanced process control's more interesting challenges, control of slag silica by flash furnace input, with a four to 10 hour lag time. In the flash furnace, a dry solid charge (DSC) of concentrate, sand and revert slag is flashed with oxygen to form a layer of matte, a slag of iron and silica, and sulfur dioxide gas.

"Slag is the biggest smelter product—approximately 70% of the DSC becomes slag," said Gerry Seguin, senior automation specialist, Vale INCO, to attendees of his session, "Application of Advanced Process Control (APC) to Flash Furnaces," at the Schneider Electric CONNECT 2016 user conference this week in New Orleans.

Slag silica is controlled by the amount of sand in the charge, and controlling the slag silica content is important because it affects the amount of metal lost to the slag, the furnace integrity, the potential for slag leaks and the potential for injuries while cleaning the slag chute. "At 36% SiO₂, the slag runs well and we can clean the skimming chute with one person. At 47%, it takes three strong people, picks and a sledge hammer, which is hard on the operators and can damage the chute. It also takes time, so we may have to slow or stop the furnace," Seguin said.

The flash furnaces have three main control variables—slag temperature, slag silica and matte grade—and they are interrelated. Slag temperature is controlled by modifying the oxygen-to-DSC ratio, which

also impacts the matte grade. Swings in matte grade have an impact on slag silica, and slag temperature is critical to furnace operation.

"Slag silica is critical for slag quality and for slag metal losses, and it is the most complex control loop," Seguin said. One controller is used for two furnaces, and each furnace has independent and significant disturbances (i.e. slag returns). Slag temperature and slag silica are both measured while skimming, so the dead time is very long—four to 10 hours depending on bin levels and feed rate.

APC offers the opportunity for better control, allowing the plant to operate closer to specification with fewer and smaller excursions for improved safety and equipment life. On the flash furnaces, model predictive control was applied to the slag silica composition



"Flash Furnace 2 average slag silica increased by 1.5%, equivalent to metal value of \$12,000 per day," Gerry Seguin, senior automation specialist, Vale INCO, to attendees of his session, "Application of Advanced Process Control (APC) to Flash Furnaces," at Schneider Electric's CONNECT 2016 event this week in New Orleans.

to set the DSC. “The risks were that we would have larger swings in slag silica and furnace temperature, so we added limits,” Seguin said, “But it didn’t happen, there were no swings.”

Slag temperature, slag silica and matte grade are now all meeting setpoints, without significant increase in variability. “For slag silica, this is especially significant,” Seguin said. “Maintaining the setpoint of 37% minimizes slag viscosity and metal losses.”

As a result of running on setpoint, “Flash Furnace 1 average slag silica increased by 1%, equivalent to metal value of \$8,000 per day. Flash Furnace 2 average slag silica in-

creased by 1.5%, equivalent to metal value of \$12,000 per day,” Seguin said. That’s at January 2016 metal prices. “We implemented them in January, which is the best time of the year for furnace operation because of the weather and cooling water temperature. Now we’re coming into a more challenging time of year,” he added.

The APC application continues to evolve. “We’re adding logic for additional situations as they’re encountered,” Seguin said. “Going forward, we’re improving the feed belt scale accuracy, working on the analysis lab service level, and adding a second temperature reading during each skimming.”



[Paul Studebaker](#) is chief editor of [Control](#). He earned a master’s degree in metallurgical engineering and gathered 12 years of experience in manufacturing before becoming an award-winning writer and editor for publications including [Control](#) and [Plant Services](#).

SCHNEIDER ELECTRIC RECOGNIZES INTEGRATOR EXCELLENCE

System integrator participants in the company’s Alliance Partner Program awarded during celebration at CONNECT 2016.

By Keith Larson, group publisher, *Control*, *Control Design* and *Smart Industry*.

The culmination of a day-long program for Schneider Electric’s system integrator Alliance partners from around the world was a gala celebration dinner recognizing excellence among the program’s participants. The awards recognize system integrators who have driven revenue growth, implemented innovative technical solutions and advanced their certifications in Schneider Electric offerings, helping its industrial and infrastructure customers meet critical technical and business challenges.

“The global System Integrator Alliance Partner Excellence Awards celebrate our partners’ loyalty

and commitment to Schneider Electric and our customers,” says Herve Lemaire, vice president, Global Sales, Partners, Schneider Electric.

“The Alliance partners we have honored and recognized for fiscal year 2015 have set the standard of excellence across our system integrator community. As we evolve our business to help our customers take advantage of the latest technology opportunities, we thank the nominees, winners and all of our registered and strategic SI Alliance partners for everything we have achieved together.”

Erhan Denizeri, general manager, Geotek Automation (right) receives Global PES Partner of the Year honors from Herve Lemaire, vice president, Global Sales, Partners, Schneider Electric (center) and Esin Gul, System Integrator Channel Manager for Middle East.



The winners of the 2015 global System Integrator Alliance Partner Excellence Awards are:

Business Development Award: Sintek (Russia)

For the second year in a row, Sintek receives this award recognizing its expertise, business growth and loyalty to Schneider Electric. A Certified Alliance partner, Sintek has repeatedly demonstrated its expertise in delivering solutions for large projects that encompass Schneider Electric's full PlantStruxure offer.

Certified Expert of the Year: Marco Aurelio dos Santos Coghi (Brazil)

Marco Aurelio dos Santos Coghi, a PlantStruxure Certified Expert from Infoeng Automacao in Brazil, has been named Certified Expert of the Year as the engineer who scored the highest results on the PlantStruxure exams during 2015. His outstanding achievement demonstrates his engineering expertise across the PlantStruxure offer.

Technical Expertise Award: ASEFO Co. Ltd. (Thailand)

ASEFO excelled in 2015 thanks to its highly skilled team of engineers, which includes several PlantStruxure Certified experts. They delivered an innovative Food and Beverage solution in 2015, meeting the customer's requirements of excellent technical and project delivery.

Global PlantStruxure Partner of the Year: Nefteavtomatika (Russia)

Nefteavtomatika is a dedicated and long-standing SI Alliance partner. In 2015, its PlantStruxure Certified experts delivered more than 20 projects with Schneider

Electric, providing innovative technical and business solutions that improved the business and energy efficiency for customers.

Global Telemetry Partner of the Year: Servicios de Automatización (Costa Rica) & Giza Arabia (Saudi Arabia)
The 2015 award for telemetry goes to both Servicios de Automatización and Giza Arabia. These two SI Alliance partners have demonstrated their extensive professional experience and expertise in delivering telemetry solutions.

Global PES Partner of the Year: Geotek (Turkey)

Geotek completed the first brownfield PES project in Turkey, meeting the challenge of commissioning the system in just one week.

About Schneider Electric's SI Alliance Partner Program

Schneider Electric's Industry System Integrator Alliance Partner Program is a global program for system integrators wanting to enhance their business opportunities by leveraging Schneider Electric's best-in-class products and solutions. The program offers system integrators a variety of benefits to build their businesses and ensure our mutual customers reach their full potential.

For more information about the global Industry System Integrator Alliance Excellence Awards, contact your local Schneider Electric representative. For more information online, [click here](#).



Keith Larson is group publisher responsible for Putman Media's manufacturing automation titles *Control*, *Control Design* and *Smart Industry*. Corporately, he also serves as vice president of content across Putman Media's other magazine titles.

DRIVE TURNS PUMP INTO SMART, CONNECTED ASSET

Process optimization, energy management and asset management benefit from services-based Altivar Process drive.

By Mike Bacidore, editor in chief, *Control Design*

The new Altivar Process variable speed drive from Schneider Electric offers a platform of standard, engineered and special features to meet the needs of industrial and municipal process applications where high functionality of features is required. Its related energy-management capabilities provides opportunities for industrial process owners, utility site operators and machine builders to measure power consumption, improve performance, control equipment and implement real-time asset management and predictive maintenance.

“We can bring up to 35% savings in energy consumption and increase productivity by up to 20%,” said Alexandre Perrat, drives marketing director for Schneider Electric, speaking at CONNECT 2016 this week in New Orleans.

“We have one of the largest drives portfolios in the market,” added Jean-Pascal Riss, Schneider Electric’s marketing director for Altivar Process. “In 2014, we shipped 1.7 million drives.” More than half of those drives were for use in process-industry applications.

Industry’s first services-oriented drive

“Altivar Process is the first services-oriented drive,” said Riss. “It is a smart connected product providing business optimization.” Processes can be optimized using decentralized application expertise, enabled by dedicated control in real time, he explained.

Altivar Process drives provide flexibility for water/wastewater, oil & gas, mining and food & beverage

applications, and they’re available in wall-mounted and floor-standing designs. Available from 1 hp to 1,100 hp, these low-voltage drives are ready to use or fully customizable. They’re tested and validated before shipment, and are modular and compact for smaller footprints.

“The Altivar Process drive is also cybersecurity certified at Achilles Level 2,” explained Perrat. “It’s a complete application asset, not just a VFD. We can record and log the energy and visibly display the energy consumption on an hourly, daily, weekly or



“The Altivar Process drive is cybersecurity certified at Achilles Level 2. It’s a complete application asset, not just a VFD.” Schneider Electric’s Alexandre Perrat explains the benefits of the company’s new services-based drive at CONNECT 2016.

monthly basis, so they know if the energy consumption is increasing or decreasing based on the working conditions. It can diagnose when a gearbox is exceeding a preset torque level or when a pump is operating outside of parameters.”

Optimize process performance and energy consumption

The drives can provide instant reaction if pump efficiency drops, thanks to embedded pump monitoring. Notification of critical operating points can be executed without additional sensors, and the drives can be integrated with pressure, flow and level control including compensation of flow losses. For example, a pump curve embedded in the drive, combined with flow-measurement and energy-measurement sensors, lets the drive understand how the motor will respond best and then optimize performance.

The data allows users to monitor key performance indicators (KPIs) related to energy and process performance. Local and remote access to energy use and customized dashboards means energy use is visible anywhere, any time, on PC, tablet or smartphone. The drive contains a web server, giving access to the information through the IIoT, the Internet or mobile asset management applications. “We can readily integrate the drive’s intelligence into Modicon M580, PlantStruxure PES or Foxboro Evo,” said Perrat. “We’re able to make sure this data is available to every level of the automation infrastructure. The idea is to have this tested architecture enable transparency across the infrastructure.”

Thanks to standardized FDT/DTM and ODVA technology, the drives also can be integrated into PLC environments, and they’re supported by predefined Unity Pro libraries.



Mike Bacidore is the editor in chief for [Control Design](#) magazine. He is an award-winning columnist, earning a Gold Regional Award and a Silver National Award from the American Society of Business Publication Editors. Email him at mbacidore@putman.net.