

Emerson Process Management: Celebrating innovation

"A few of the members of the Valve Automation technical leadership team gathered at one of the interactive stations of the new Collaboration and Solution Center" Pictured from left to right – Fayyad Sbaihat, Director, Global Marketing & Business Development; Scott Bauer, Vice President, Electric Actuation; Dave Plum, President; Sue Ooi, Vice President, Engineered Products; and Todd Craft, Vice President, Global Engineering.

By Christian Borrmann

Emerson Process Management, a business of Emerson, is a leader in helping businesses automate their production, processes and distribution capabilities to improve plant reliability, extend the life of costly assets, improve safety compliance, lower costs, and increase overall productivity. Emerson's innovation in key technologies is unmatched: the world's first fully digital plant architecture, the first fully digital safety system, the most robust wireless technology portfolio, remote / low-power field communications, the industry's broadest offering of diagnostics-based "Pervasive Sensing" instruments, and monitoring applications to convert this

data into actionable information. Automating business production and processing in the chemical, oil and gas, refining, pulp and paper, power, water and wastewater treatment, mining and metals, food and beverage, life sciences and other industries, Emerson Process Management combines products and technology with industry-specific engineering, consulting, project management and maintenance services. Its brands include Fisher®, Micro Motion®, Rosemount®, Bettis™, Daniel™, Roxar™, Delta V™ and Ovation. In the areas of valve automation and final control, Emerson has embraced the solutions-minded corporate attitude to solve even the toughest industry

applications with leading edge innovation. Emerson Process Management Valve Automation through its brands, continually strives to find ways to provide safer, more cost effective and extend asset reliability which has earned them their position as an industry leader. As demands on plant performance have increased and global industry regulations become more exacting, Emerson's valve automation products have risen to the challenges with improvements in materials, operational features and software technologies. As Valve Automation president Dave Plum states, "As a business unit in Emerson's Final Control & Regulate, we market to all of the major global valve makers. The

biggest change we have seen the past 10 years is this – our clients no longer inquire to us for actuators as a valve component, but rather seek complete valve operating solutions that help them improve their business results. This only happens because our customers know from experience that they can trust any product that carries the Emerson name."

A well testing game changer

Valve Automation products are designed to provide efficiency with minimal footprint and lighter weight, coupled with durability and innovative features that can provide enormous cost savings to its users. An example of this technology is the Multiport Flow Selector (MPFS). The unique device is used for the efficient testing of oil and gas well liquids production and management of the reservoir.

Prior to the MPFS, this requirement was traditionally accomplished by opening and closing a series of flow manifolds to individually test the constituents of a hydrocarbon flow from the wellhead. In offshore applications, this necessary function can entail a flow manifold for the producing wells and a separate test manifold for flow diversion and testing. The space requirements and skid weight are substantial, adding significant cost to the topsides facility CAPEX. For a seven

well production scheme, a total of 21 isolation and check valves are required (Figure 1). Traditionally, each valve has been manually operated, adding to the operating and maintenance costs. The same configuration is necessary for onshore wells which, while the space and weight constraints are not as critical, have longer and more complex piping runs from multiple wells that make skid mounted testing devices the largest physical part of the flow equipment system. The Emerson MPFS alternative provides numerous benefits not found in traditional methods. It is a single compact system with a rotating plug that allows the flow from a single well to be diverted from the production for testing, shrinking the number of valves by two-thirds. The MPFS is less costly and less complex, greatly reducing potential maintenance problems at leak points, using less power and simplifying piping requirements. When coupled with an Emerson Bettis™ electric valve actuator specifically designed for that purpose, the device can precisely control the flow and automatically switches the diverted well flow remotely from a control network. By reducing the number of isolation valves required and minimizing the need for manual intervention, the MPFS promotes safety and reduces the possibility of human error.

Advancing wireless technology

Emerson's 'smart' capabilities include wireless and it is transforming the industry by providing solutions to countless process applications. Within Emerson, wireless is viewed as an enabling technology that creates an opportunity for the customer to effectively implement a variety of solutions that were previously operationally or cost prohibitive. Furthermore, Emerson's use of the Wireless HART open architecture creates a flexible, secure and reliable network. Last, but certainly not least, safety is always a top priority for customers in all process industries. Wireless technology enables Emerson's customers to remove people from potentially hazardous environments and create real value for the customer by reducing the risk to human life. The benefits of wireless continue to be uncovered and the possibilities are tremendous. Wireless technology can accelerate development and implementation of other capabilities for the customer in a cost effective, flexible, and secure way. Emerson's quest to partner and solve customer problems using wireless Valve Operating Systems™ with either pneumatic or electric actuators leads a new trend in the industry.

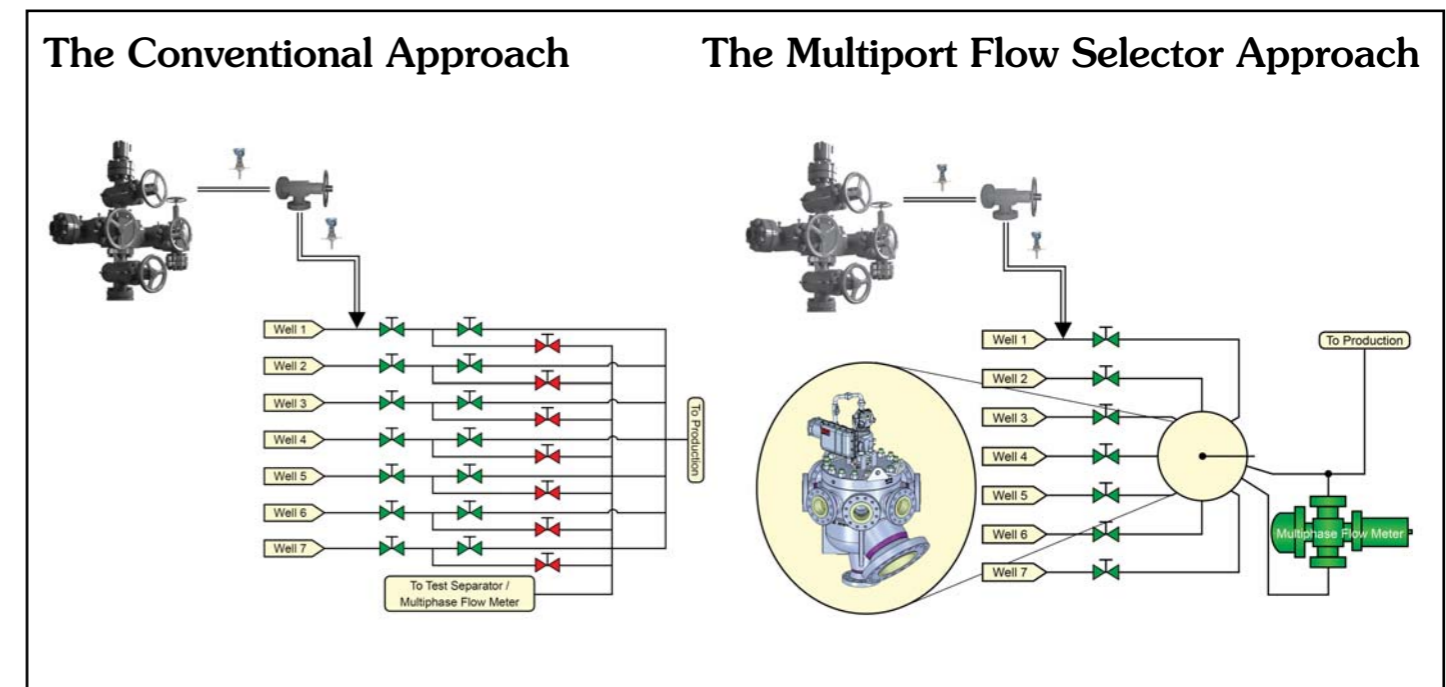


Figure 1: Conventional vs Multiport Flow Selector Approach.

Product advances continue in 2014

For over two centuries, Emerson brands collectively have served the process industry. In 2014, the company will announce a roster of new and enhanced products designed to meet current industry needs. Among them include:

Valve Protection

High pressure, fail-close applications can subject valves and actuators to abrupt flow surges that can over time cause failure to seals and internal parts. The resulting vibration of pressure surges can cause further damage to adjoining pipe joints and flanges. As a result, fugitive emissions are possible from leaking devices and are of great concern to operators. Valve Automation rack and pinion design enhancements will help diminish the effects of quick closing cycles on critical valve components. As a result of these improved actuator features, valve life will be extended, maintenance reduced and process gas emissions minimized.

Integrated, Explosion-Proof Actuators

Simplicity, reliability and compactness all help define FieldQ™ rack and pinion actuators. Because of its modular design, FieldQ reduces the complexity of service, maintenance and spare component inventory. The newest FieldQ innovation is an ATEX Ex-d rated module. This solution houses electrical connections, switches and pilot valves in a single housing, with field-replaceable cartridges that allows flexible and modular service options. In addition it includes a non-intrusive end stop adjustment that allows for service without intrusion into the hot electrical compartment. Its side mounted controls and compact physical profile allows FieldQ to be direct-mounted to the valve for use in applications where tight piping runs and



FieldQ Exd eliminates complexity and offers compact solution.

In 2013, Emerson opened its new \$34 million Industry Center for Hydrocarbon and Energy, which has more than 360 employees, and is home to Valve Automation's global headquarters. The center located in one of the world's largest Energy Corridors in Houston, Texas, provides leading-edge training with visual technology connecting global experts for presentations and seminars. A demonstration area provides hands-on experiences with Emerson's range of valve automation products. Further, in-depth answers to their problems can be then provided by Emerson technical experts worldwide. This collaboration with customers and synergy with all available Emerson technologies provide readily available solutions with enormous benefits.

As Valve Automation president, Dave Plum notes, "While it's true much of our innovation has been focused on product technology these past few years and we have and will continue to deliver much in this area (Bettis plans four exciting new products in the next 12 months), it's not enough. Here's the thing, as we go forward innovation is becoming a core value that must work across our enterprise – we are identifying and adapting to new business models, business system implementations, and operational execution from quote-cash, digital interaction with our customers, and collaboration across global locations and matrix organizations. It's critical to meet the expanding demands which for whatever reason is increasing in complexity as our customers push the envelope with their project investments. Innovation in technology, commercial engagement, and execution are absolutely critical; Emerson is the leader in bringing innovative solutions to customers and creates a vehicle for collaboration through its innovation centers."

The Emerson Innovation Center in Austin, Texas provides global leadership for control systems development, integrated operations consulting, project execution and human centered design.



The Emerson Innovation Center in Austin, Texas provides global leadership for control systems development, integrated operations consulting, project execution and human centered design.



The Collaboration and Solution Center in Houston, Texas parallels other similar centers in Emerson Process Management that deliver answers so users can greatly improve their operations.

Emerson's third Innovation Center was announced last month. The new facility in Austin, Texas serves as Emerson's automation systems and project services business which helps customers safely, reliably and profitably operate facilities in numerous process industries. It complements the Innovation Center in Marshalltown, Iowa, which develops and tests final control applications and technologies, replicating real-world conditions and the one in Pune, India which focuses on world-class software application development. Mr. Plum continues "These centers serve to help our teams and customers recognize challenges and identify alternate approaches to improve operational effectiveness. There is real value in creating an atmosphere for cross-functional teams to meet in their locales, collaborate via video conferencing or other applications and access process or asset data in real-time which can lead to streamlined decision making workflows."

Emerson's third Innovation Center was announced last month. The new facility in Austin, Texas serves as Emerson's automation systems and project services business which helps customers safely, reliably and profitably operate facilities in numerous process industries. It complements the Innovation Center in Marshalltown, Iowa, which develops and tests final control applications and technologies, replicating real-world conditions and the one in Pune, India which focuses on world-class software application development. Mr. Plum continues "These centers serve to help our teams and customers recognize challenges and identify alternate approaches to improve operational effectiveness. There is real value in creating an atmosphere for cross-functional teams to meet in their locales, collaborate via video conferencing or other applications and access process or asset data in real-time which can lead to streamlined decision making workflows."

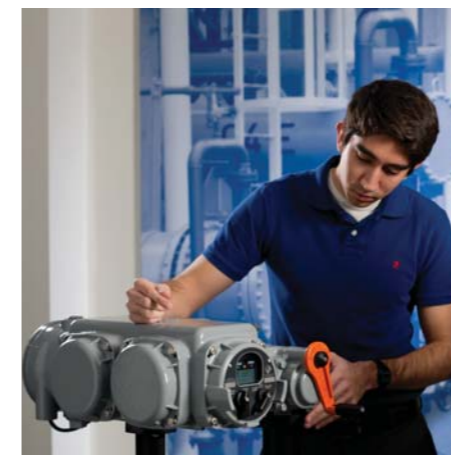
Emerson's third Innovation Center was announced last month. The new facility in Austin, Texas serves as Emerson's automation systems and project services business which helps customers safely, reliably and profitably operate facilities in numerous process industries. It complements the Innovation Center in Marshalltown, Iowa, which develops and tests final control applications and technologies, replicating real-world conditions and the one in Pune, India which focuses on world-class software application development. Mr. Plum continues "These centers serve to help our teams and customers recognize challenges and identify alternate approaches to improve operational effectiveness. There is real value in creating an atmosphere for cross-functional teams to meet in their locales, collaborate via video conferencing or other applications and access process or asset data in real-time which can lead to streamlined decision making workflows."

Emerson's third Innovation Center was announced last month. The new facility in Austin, Texas serves as Emerson's automation systems and project services business which helps customers safely, reliably and profitably operate facilities in numerous process industries. It complements the Innovation Center in Marshalltown, Iowa, which develops and tests final control applications and technologies, replicating real-world conditions and the one in Pune, India which focuses on world-class software application development. Mr. Plum continues "These centers serve to help our teams and customers recognize challenges and identify alternate approaches to improve operational effectiveness. There is real value in creating an atmosphere for cross-functional teams to meet in their locales, collaborate via video conferencing or other applications and access process or asset data in real-time which can lead to streamlined decision making workflows."

other hard-to-access places make valve automation installation and maintenance difficult. The unique product lends itself for use in an integrated Valve Operating System™, another Emerson solution for single-source responsibility that combines actuation, controls, mounting, application engineering and documentation into a ready-to-install package.

Common Software for Electric Actuators

Real-time knowledge of a valve's performance is imperative for averting costly unplanned shutdowns and unneeded valve maintenance or replacement. The ability to configure, diagnose and monitor valve operation uniformly across its electric actuator offering is a plus for using Emerson products and suite of technologies. Valve Automation's advanced soon-to-be released software package provides predictive intelligence and is compatible with Emerson's PlantWeb™ digital plant architecture. With open architecture communication, it can interface with any of the leading industry protocols and its capability will support offline or online diagnostics to identify benchmark and valve torque profiles and conduct partial stroke tests.



DCMLink intuitive program screen alerts if the TEC2000 or other electric actuators has an imminent problem.

Expect more of the same

The success of its brands has been molded by innovation and reinforced by company leadership to continually provide the most advanced solutions. In 2014, several Emerson brands will have milestone anniversaries that celebrate the brands' longevity and track record that the industry has come to rely upon.

The Bettis™ brand has carved a global reputation for continual innovation and performance. In 2014, it celebrates its 85th anniversary of operation. The brand has been a pneumatic and hydraulic valve actuator pioneer for both onshore and offshore applications. Its design innovations have been among the first to be used in unique industry applications, including rigorous nuclear service and subsea emergency shutdown (ESD) valve control. Its revolutionary designs have provided considerable CAPEX savings with smaller envelope dimensions and lighter weight but without any sacrifice in torque output. EIM™, the most recent Emerson acquisition to Valve Automation, started operations in 1949 and is turning 65 years old this year. The EIM brand is recognized as a premier electric actuator provider, building its reputation on technological advances. EIM is a distinguishable automation leader with numerous patented innovations that have become standard actuator features. Among their advances were the first network digital control system and the automatic declutching handwheel. Their electronic operation and control systems enhance the almost indestructible mechanical components that have helped the actuators provide years of reliable service. El-O-Matic™, founded 40 years ago in Hengelo, The Netherlands, produces durable rack and pinion actuators that are known for service longevity with virtually no maintenance required. Its slogan of *Fit and Forget* speaks to the ability of El-O-Matic to be used reliably with minimal maintenance in myriad process and industrial quarter-turn or multi-turn applications. Emerson's Dantorque™ brand of helical spline subsea and marine actuators and controls has provided 25 years of reliable operation in near record ultra-deep waters approaching 10,000 feet. Rounding the portfolio of automation products is Shafer™. With an operating history of almost 70 years and an installed base of more than 100,000 gas/hydraulic-operated units, Shafer's dependability has repeatedly been proven in critical gas transmission and compressor station applications. In addition, its emergency control packages remotely and reliably detect and shut down pipeline line breaks.



Images of Emerson Valve Automation products.

