

A NEW YEAR BRINGS NEW CHALLENGES

# WALWEE

MAGAZINE

WINTER 2014  
VOL. 26, NO. 1



## Keeping Watch Through Wireless Technology

COMPRESSION  
PACKING  
FRICTION

STANDARDS  
FOR  
PURCHASING

VETERANS  
SHARE THEIR  
SECRETS

NEW EPA  
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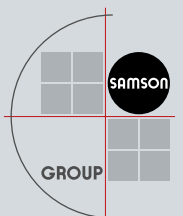
## **SAMSON CONTROLS INC.**

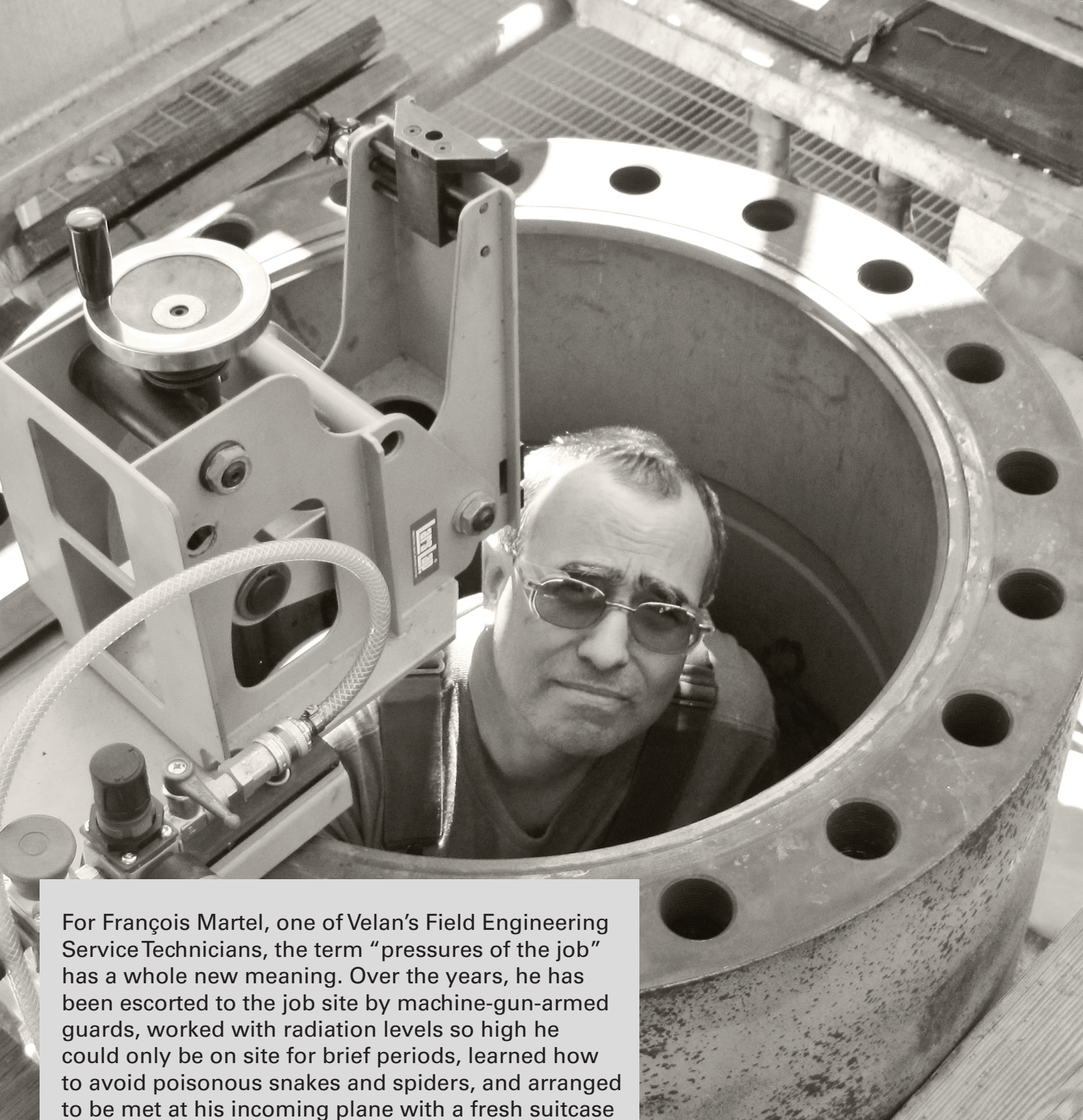
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For François Martel, one of Velan's Field Engineering Service Technicians, the term "pressures of the job" has a whole new meaning. Over the years, he has been escorted to the job site by machine-gun-armed guards, worked with radiation levels so high he could only be on site for brief periods, learned how to avoid poisonous snakes and spiders, and arranged to be met at his incoming plane with a fresh suitcase of clothes so he could travel to another project half way around the world.

What you might not know about François is that he likes challenges off the job too. That's why he's just signed up for scuba diving lessons so he can explore a whole new underwater world when he's not literally up in the air.

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Compression packing, while an effective way to seal valves, is constantly challenged by friction issues. There are several ways, however, to minimize the challenges.

BY WAYNE EVANS

## 22 NUGGETS OF KNOWLEDGE

VALVE Magazine talked to veterans of the valve and actuator industry to see what they've learned in their long careers and what advice they have for the newer generations.

BY KATE KUNKEL

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Technology has provided a host of new ways to monitor equipment in plants, safeguarding employees and plants, and making processes operate smoother. Wireless is a cost-effective way to track individual valves.

BY MIKE LUTOLF

## 30 CREATING A STANDARD TO COMPARE CONTROL VALVE PRODUCTS

A manager for a giant grain and oilseed supply chain shares how he created a standardized method to assist young engineers in buying the right control valves.

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PRODUCTS



- High-speed Actuator
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- Severe-service Knife Gate
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- Switch Package
- Magnetic Flow Meter
- Automation Monitoring
- New Website

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## THE CHALLENGES OF NEW TYPES OF FEEDSTOCK

Availability of non-traditional feedstocks from natural gas liquids has led to cost-advantaged olefins production, leading to unprecedented spending in existing plants and new facilities.

The first in a series of three articles discusses critical valve applications in the furnace. BY BLAKE COLEMAN

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- » Improved Electric Actuator Reliability in Severe Service
- » Interview: Richard Coffman
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- » Creating Electricity from Waste Energy in Water Plants
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# Trade Association Networking



**VMA is in the unique position** of providing a place where companies that compete on a daily basis come together to share ideas, voice concerns and socialize. That's the nature of an association, as I've learned in my 40-plus years in the trade association field (first with the Savings Banks Association of New York State, followed by the Rubber Manufacturers Association and now VMA). During my years, I've also come to realize the critical advantage of being able to network with my counterparts at other associations. With associations, we may not compete daily, but in many instances, we are courting the same companies. We have the same goals: growing our membership.

VMA has developed some very strong liaisons with related trade associations over the years, and I would like to share our favorable experiences with a few of them:

- **Hydraulic Institute (HI)**—For seven years we have shared our Market Outlook Workshop with members of HI, the association representing pump manufacturers. The workshop provides an economic forecast for the many end-user industries we have in common. The premise in deciding to do this together was that, since VMA had a program in place, there was no need to “reinvent the wheel.” The joint experience has turned out to be a great one for both groups, and we've shared much more than speakers. HI is also using ITR Economics, which we recommended after years of using the firm ourselves.
- **The European Committee for the Valve Industry (CEIR)**—For 23 years VMA has been attending and sharing ideas with our European brethren. We've traveled the Atlantic to attend each other's meetings, and our relationship has led to relationships with other nations such as Japan and India.
- **Plumbing Manufacturers International (PMI)**—When PMI moved from an association management firm to hire an in-house executive director many years ago, I visited with that new leader and told her about our relationship with our European counterparts. I explained how PMI would benefit from CEIR contact as well. Since 2000, PMI and VMA have jointly attended CEIR meetings.
- **Fluid Sealing Association (FSA)**—Because FSA members are suppliers to our industry, VMA recently started discussions with that organization regarding areas where the two groups could work together towards common goals. I hope to meet with FSA later this year to discuss the ideas in more detail.

In addition, although VMA does not develop standards, we have an ongoing dialogue with such groups as the American Petroleum Institute, Manufacturers Standardization Society of the Valve and Fittings Industry, American National Standards Institute, American Water Works Association and others.

With all of these groups, we both talk and present our views, and we learn by listening. Our goal is to provide our membership with information outside our four walls that might benefit their businesses.

As always, we are also open to any suggestions for other activities members feel are important. Please feel free to contact me directly at [wsandler@vma.org](mailto:wsandler@vma.org). VM

**Bill Sandler**  
President

*Valve Manufacturers Association of America*



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PHOTO COURTESY OF SBM OFFSHORE

□ SBM Offshore's largest completed FPSO to date is FPSOs Cadade De Paraty. The new FPSOs will be similar.

## NEW CONTRACTS

### SBM Offshore Awards FPSO Equipment to Cameron

Cameron announced the award of gas processing packages from SBM Offshore for floating production storage and offloading (FPSOs) destined for the Lula field pre-salt area of offshore Brazil.

SBM is building the FPSOs, which are the Cidade de Maricá and Cidade de Saquarema. They will be replicas of the Cidade de Ilhabela FPSO project currently underway in Brazil for which Cameron is providing gas dehydration and CO<sub>2</sub> removal packages.

The packages for the new contract will be primarily used for gas dehydration and acid gas removal before routing the gas to reinjection compressors.

### ValvTechnologies Selected for FLEX

ValvTechnologies is participating in implementing the Tennessee Valley Authority's Watts Bar 1&2 and Duke Energy's Catawba 1&2 diverse and flexible coping capabilities (FLEX) initiatives. ValvTechnologies is actively pursuing a fleet-wide compliance approach with owner/operators of

U.S. nuclear plants to address specific needs for addressing FLEX strategies.

The U.S. Nuclear Regulatory Commission developed FLEX strategy to address the loss of cooling capability and electrical power that would result from a severe natural event such as Fukushima. The resulting program will make U.S. nuclear facilities safer.

### Mueller Gets Two City Contracts

The city of Jackson, MS will upgrade its water system with Mueller Systems' advanced metering infrastructure (AMI) network through a contract from Siemens Industry, Inc.'s Building Technologies division.

Also, the city of Kannapolis, NC will upgrade its water system with the AMI network. Kannapolis will implement the Mi.Net Mueller Infrastructure Network for Utilities—Mueller Systems' advanced two-way AMI network. The system will automate the city's meter reading-to-billing process by linking its meters, distribution sites and control devices in a single data network.

Mueller Systems is a subsidiary of Mueller Water Products, Inc.

### Metso Automation to Run Asia's Largest-Capacity Biomass Plant

GS Engineering & Construction Co., Ltd., has chosen Metso to supply automation for the Dangjin 4 Biomass Power Plant, currently under construction in Dangjin City, South Korea. Once completed in 2015, the 105 MW plant will be the largest of its kind in Asia.

Metso's delivery scope includes a Metso DNA automation system (DCS) for the whole power plant, including the CFB boiler, balance of plant and electric network. It also includes a plant performance application and systems for thermal stress monitoring and vibration monitoring.

### Flowserve Receives Actuator Order for World's Largest Solar Power Plant

Flowserve Corporation announced the Kaxu project will use 307 Limatorque MX10 actuators. The project will result in the world's largest solar power plant in Pofadder, Northern Cape, South Africa. Earlier this year, Flowserve won the contract for all the project's critical pump services.

Kaxu also will deliver the first parabolic trough solar plant in South Africa. Once operational, the plant will use a heat transfer fluid and molten salt energy storage design that can produce power for up to three hours after sunset.

## MERGERS & ACQUISITIONS

### Rotork Acquires Renfro Associates, Inc.

Rotork recently acquired Renfro Associates Inc., a design and manufacturing firm based in Broken Arrow, OK. The company has provided valve-automation packages for a wide range of flow control applications since 1979.



□ Schematic of Dangjin-4 Power Plant.

According to Rotork CEO Peter France, "The acquisition provides Rotork with the opportunity to repeat the success of our UK-based Valvekits business by expanding the Renfro offering across the USA."

### Emerson Purchases Enardo

Emerson has acquired Enardo LLC, which specializes in safety and environmental control equipment for the oil and gas, petrochemical, wastewater, refining and other industries.

Enardo, with about \$65 million in sales last year, manufactures tank and terminal safety equipment, including hatches, vent,

pressure and vacuum relief valves and flame arrestors used in the oil and gas, petrochemical, chemical and other industries. Enardo was previously a division of HMT, a provider of above-ground storage tank products and services based in The Woodlands, TX.

### Curtiss-Wright Flow Control Acquires Software Company

Curtiss-Wright Flow Control (CWFC) has acquired the assets of Ovalpath, Inc. for about \$3 million in cash. Ovalpath, a start-up software company, developed a proprietary software platform used in mobile device-based applications serving

the commercial nuclear power market.

The acquisition will be integrated into Scientech, a business unit of the Nuclear Group of CWFC. With Ovalpath's software platform as the foundation, CWFC will develop multiple solutions for nuclear power plant mobile field workers.

## AWARDS & HONORS

### Victaulic Named 2013 Business of the Year

In November, Lehigh Valley Business named Victaulic 2013 Business of the Year. The award recognizes an organization headquartered

in Pennsylvania's Greater Lehigh Valley that has shown business excellence through company accomplishments, growth, leadership and community involvement. Victaulic received the honor at Arts-Quest, SteelStacks in the presence of more than 400 successful business leaders from around the region.

### Metso Voted Top Automation Supplier for Pulp and Paper

Metso's automation business has been recognized by the Brazilian Pulp and Paper Technical Association with the award of "Top supplier

CONTINUED ON PAGE 8

## MARKET FOCUS: Valve Manufacturers Begin 2014 with Cautious Optimism

In general, more valve and actuator manufacturers expect shipments going into 2014 will look better than what occurred going into 2013, according to respondents to VMA's State of the Economy Survey. About 88% said they expect greater shipments in the first quarter of 2014 over the first quarter of 2013. That compares to December figures of 84% and figures of about 85% for the first quarter in 2013.

Optimism among manufacturers has been steadily increasing over the last six months. In July, for example, less than 30% of manufacturers projected booking orders for that month would be greater than booking orders for July of 2013.

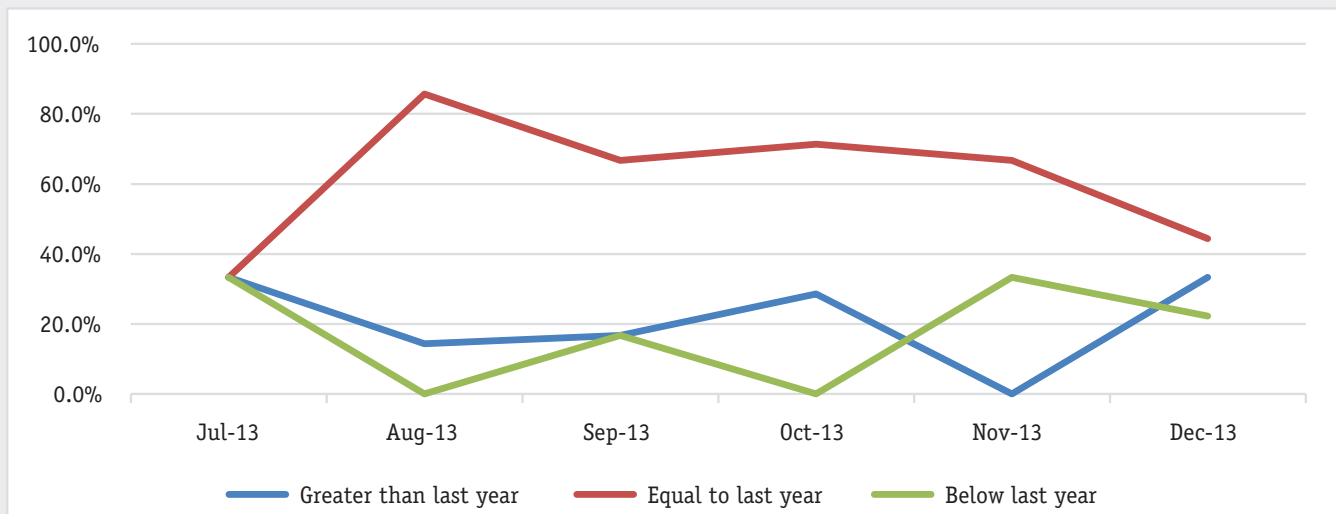
That had climbed to just under 50% by September, dipping slightly and ending at almost 65% by the end of the year.

Meanwhile, by December, those that said orders would fall below last year's numbers had fallen from just more than 10% in July down to a few percentage points at year's end.

Projections for next quarter shipments stayed more steady over the six month period, hovering at 30-40% every month except August, when 56% projected greater shipments over a year ago.

Overall, VMA's members currently are slightly optimistic about the economy.

### ORDERS BOOKED - Next Quarter Projections



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gparente@vma.org.

of automation for the pulp and paper industry." The winner was selected by professionals in the sector as well as a strict technical evaluation of the candidates. This is the eighth consecutive year Metso has won such an award.

**Emerson's Terry Buzbee Inducted into Iowa Business Hall of Fame**

The Greater Des Moines Committee recognized Terry Buzbee, president of Emerson Process Management's



Fisher business, as a 2013 inductee to the Iowa Business Hall of Fame.

The inductees were honored during the Greater Des Moines Committee's annual Black Tie Dinner held at The Meadows Events and Conference Center on Dec. 5.

The hall of fame honors the achievements of Iowans who have made outstanding contributions to the development and enhancement of Iowa's business climate.

**COMPANY CONNECTIONS**

**Farris Engineering Enters New Agreement for Naval, Marine Sales**

Farris Engineering, a business unit of Curtiss-Wright Flow Control, is teaming up with JA Moody, and designating them as the Farris Engineering sales representative to the U.S. Navy and commercial marine markets.

JA Moody will represent the full line of Farris pressure-relief products to the naval and commercial marine industries, with an



emphasis on selected valves in the product line that meet U.S. Coast Guard and military specifications. Farris expects to expand its specialized offerings in these markets over the next several years.

**ValvTechnologies Supporting Portersville Valve Growth Plans**

ValvTechnologies has signed a management agreement with Portersville Valve Company to support growth plans in Pennsylvania, West Virginia, New York, Ohio and Maryland.

Todd Pozzuto, general manager of Portersville Valve, said that plans include a new 60,000-square-foot facility to be constructed on a recently purchased 23-acre site.

**Cameron Teaming with Automated Valve & Control**

Automated Valve & Control (AVC) and Cameron are teaming up to bring Cameron's DYNATORQUE gears to the Gulf Coast and Western regions of the U.S.

AVC has over 40 years of experience in the valve & actuator industry. The company was among the first to produce automated valve packages.

**A.W. Chesterton Expands Distribution Territory**

Valve Automation & Controls (VAC) expanded its distribution territory with A.W. Chesterton Company to include Los Angeles and San Diego.

The relationship between W&O, VAC and Chesterton began in late 2012 when Chesterton was seeking to expand its influence in the marine industry, which led to a successful partnership with W&O in the Gulf of Mexico. The new partnership will allow VAC to broaden its customer base to include commercial and industrial markets.

**Spirax Sarco Signs Partnership with J.M. Electrical Company**

Spirax Sarco, Inc. has announced a partnership with J.M. Electrical Company Inc., now a factory-authorized service supplier of Spirax Sarco that will assist in servicing and commissioning commercial and industrial accounts throughout New England.

J.M. Electrical technicians will be responsible for commissioning and start-up of heat exchangers, metering, control valves and related instrumentation products.

**CERTIFICATIONS & STANDARDS**

**DeZURIK Receives Certification to Sell Valves to Russian Federation**

DeZURIK, Inc. has received GOST certification that allows sales of its complete product line into the Russian Federation. The certification was achieved in cooperation with DeZURIK's newly appointed sales repre-

CONTINUED ON PAGE 10

# SIEMENS



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## One that masters everything: SIPART PS2

Intelligent positioner for unlimited flexibility

It is not without reason that the SIPART PS2 from Siemens is the most widely used positioner for linear and part-turn actuators. For almost twenty years, this globally proven all-round design has ensured safe and precise sequences in the process industry. A wide variety of mounting options for countless valve applications make it an extremely flexible all-rounder that offers outstanding performance in almost every industry: from chemicals, oil and gas to pharmaceuticals, food and beverages, or marine engineering.

Whether it is a matter of extremely precise control of valves or the reliable regulation of actuators, SIPART PS2 can be relied on to have everything under control. Even in terms of simple installation and fast commissioning, it scores highly in at every stage. By providing reliable diagnostic data about the valve and actuator, the SIPART PS2 also reduces maintenance requirements in the plant and ensures maximum functional integrity in emergency situations.

**Answers for industry.**

sentative SVPRK, headquartered in Moscow.

It ensures a product's compliance with Russian safety regulations. The certification covers DeZURIK's plug valve, butterfly valves, knife gate valves, rotary control valves, air valves, check valves, ball valves and cone valves.

### Mueller Water Products Plant Earns OSHA Highest Safety Rating

Mueller Water Products, Inc. announced that its Mueller Co. Albertville, AL plant has earned the Star certification from the U.S. Occupational Safety and Health Administration (OSHA). Star is the highest level of recognition offered through OSHA's Voluntary Protection Program. The Albertville facility becomes only the sixth foundry in the United States—and the only one in the Southeast—to earn the Star designation.

## NEW FACILITIES

### Weir Group Announces \$113 Million Expansion in Malaysia

The Weir Group PLC recently disclosed a major expansion of its operations in Malaysia. The announcement was made following a meeting between the UK Prime Minister David Cameron, the Malaysian Prime Minister Datuk Seri Najib Tun Razak and Weir Group Chief Executive Keith Cochrane.

Weir will invest more than \$113 million over the next three years building an additional foundry, machine shop and a second Linatex continuous rubber processing plant on a campus southeast of Kuala Lumpur.

### Bradken Opens New Facility for Radiographic Inspection

To meet a rapidly rising demand for radiographic inspection of mission critical cast pumps and valves for nuclear power generation, offshore drilling and military applications, Bradken has added an additional concrete bunker.

The new bunker will have a new higher-powered 9 MeV linear accelerator to increase the company's capacity and capability. The building includes a vault with 8- by 40-foot-high walls with an 18-inch thick concrete roof.

### Emerson Opens New Global Headquarters for Regulator Technologies

Emerson Process Management has opened its new



□ The ribbon cutting ceremony for the new Watson Grinding facility

\$25 million global headquarters for the design, testing and manufacture of regulator technologies, including pressure regulator and relief valve solutions to help oil and gas, chemical, refining, power and other industries run their processes and operations in McKinney, TX.

The new global regulator technologies headquarters

is home to a research facility with a flow lab capable of testing regulator products in extreme conditions, as well as various materials and environmental laboratories.

### New Manufacture and Repair Facility for Watson Grinding & Manufacturing

Watson Grinding & Manufacturing, Watson Valve Services Inc. held a ribbon-cutting ceremony for its new 19,000-square-foot valve repair and manufacture facility. The Watson campus now spans several city blocks and encompasses more than five buildings with over 84,000 square feet total.

### Rotork Opens Valve Automation Center in Mexico

Rotork recently opened its new Valve Automation Center in Mexico. Strategically located in Mexico City, it is

□ Emerson's new global regulator technologies headquarters building



## PEOPLE IN THE NEWS

**POWELL VALVES...** announces that **Matt Reverman** has been promoted to chief engineer. Reverman has been with Powell for more than 12 years. He will be responsible for all engineering functions within Powell, including valve design, engineering services and support.

**QTRCO...** has promoted **Shawn Hughes** to chief executive officer. Meanwhile, **Steve Bur-smith** has been invited to serve on the company's board of directors. **Ed Holtgraver**, who now has the title of chairman & chief technical officer, said: "While I will continue to actively contribute, these changes will provide a strong leadership base upon which the future will be built."

**THE WEIR GROUP PLC** announced that **John Heasley**, formerly managing director, Valves, has been promoted to divisional managing director, Power and Industrial. He succeeds **Kevin Spencer**, who retired at the end of December 2013.

## NEW MEMBERS

**Classic Controls, Inc.** joins VMA as the first-ever associate distributor/channel partner member. Classic Controls was established in 1991 as a representative for instrumentation, control valves and systems for the state of Florida. Today it is a total solutions provider for industrial process businesses. Classic Controls serves as a distributor for VMA members GE Energy, AUMA Actuators and Pentair Valves & Controls.

**Sunbelt Supply Co.** became VMA's second associate distributor/channel partner. Founded in 1978, Sunbelt is based in Houston. The company maintains large inventories of valves, actuators and accessories in North America from more than 50 major manufacturers and is an authorized Automation Service Center for several VMA members.

The following companies have also joined the VMA family:

VMA's first full member of 2014 is

**Val-Matic Valve & Mfg. Corp.** is a designer, manufacturer and marketer of check valves, quarter turn shut-off valves, air valves and foot valves for water/wastewater, industrial and building markets. The company was founded in 1966; its corporate headquarters and manufacturing are based in Elmhurst, IL.

Located in Chardon, OH, new associate member **EGC Enterprises, Inc.** engineers and manufactures graphite composites for gaskets, seals, laminates and thin-film heaters used in fluid and thermal systems management.

Founded in 1946, **Stainless Foundry & Engineering**, Milwaukee, WI, joins as an associate member. The company is a privately owned sand casting, investment casting and machining service provider. It produces 100% for-sale castings used in the valve, pump, chemical, petrochemical, nuclear, pulp & paper, pharmaceutical, food & dairy, metering, military and instrumentation industries.

the first full shop facility for Rotork in the country. The building houses the new headquarters for Rotork's Mexican subsidiary company, incorporating inside sales, contracts, after sales and service departments as well as a training center for customers and end users.

The factory will focus on actuated valve factory fit operations and carry actuators, gearboxes and key spare parts to provide swift deliveries to customers.

### Siemens Welcomes U.S. Valve Positioner Configuration Center

In October, Siemens Process Instrumentation cut the ribbon to inaugurate its new U.S. Valve Positioner Configuration Center in Spring House, PA. The center, part of a 40,000-square-foot facility, will support the requirements of the growing U.S. valve market for industries such as power generation, chemical, food and beverage, pharmaceutical and oil and gas.

The new facility is certi-

fied to three key management system standards that will better support domestic manufacturing and quality control, including ISO 9001:2008 for Quality Management Systems, ISO 14001:2004 for Environmental Management and OSHA S 18001:2008 for Occupational Health and Safety Management.

### Allagash International Opens New Office in Venezuela

South Portland, ME-based Allagash International has opened an office in Caracas, Venezuela. The office will complement its operation in Bogota, Colombia. The new office is part of an effort to expand its operations outside of the United States to support the export trade.

### Louisiana Plating & Coatings Expands by 80,000 Square Feet

Louisiana Plating & Coatings, a wholly owned division of Houston Plating & Coatings, recently began operations at its new 80,000-square-foot facility in Scott, LA. When fully

operational, the plant will employ 100 employees and provide area manufacturers a variety of corrosion and wear protection services, including electroless nickel plating, salt bath nitriding, phosphate and spray coatings.

### Flowserve Expands Quick Response Center

Flowserve announced the opening of its new and expanded Quick Response Center (QRC) in Aberdeen, United Kingdom. The Aberdeen QRC provides service for rotating equipment to pump and seal customers in the upstream oil and gas, general industrial, and power industries. The new facility offers more flexibility in the size and types of pumps that can be handled because it is equipped with an eight-ton lifting capacity. The facility is three times as large as the previous one.

At about 15,000 square feet (1,400 square meters), the Aberdeen QRC is also a "green" facility. VM

## CALENDAR 2014

### MARCH

5-7

#### VMA Technical Seminar & Exhibition: Fugitive Emissions

Las Vegas  
[www.vma.org](http://www.vma.org)

18-20

#### INTERPHEX 2014

New York, NY  
[www.interpex.com](http://www.interpex.com)

### APRIL

2-3

#### VMA Basics Seminar & Exhibits: Valves, Actuators & Controls 101

Kansas City  
[www.vma.org](http://www.vma.org)

10-11

#### Finance Leaders Seminar\*

Arlington, VA  
[www.vma.org](http://www.vma.org)

30-May 2

#### Manufacturers Workshop & Mazak Tour\*

Florence, KY  
[www.vma.org](http://www.vma.org)

### MAY

5-8

#### 2014 Offshore Technology Conference

Houston  
[www.ofnet.org](http://www.ofnet.org)

20-23

#### AFPM Reliability & Maintenance Conference and Exhibition

San Antonio  
[www.afpm.org](http://www.afpm.org)

### JUNE

5-6

#### Valve Repair Meeting & Exhibition

Houston  
[www.vma.org](http://www.vma.org)

8-12

#### ACE Conference & Exhibition

Boston  
[www.awwa.org](http://www.awwa.org)

\*Open only to VMA/VRC members



## VMA Technical Seminar & Exhibition: Valve Emissions for Compliance, Standards and Technology

Ken Garing, an engineer from the National Enforcement Investigations Center of the Environmental Protection Agency, will address what his agency and other regulators are doing to focus more intently on the source of this nation's fugitive emissions at VMA's Technical Seminar & Exhibition on March 5-7, 2014. Garing will talk about how regulation and enforcement have gotten tighter and explain what the center is doing to more actively monitor chemical and asphalt plants, refineries and other facilities where valves, flanges, connectors, compressors and pumps might be contributing to emissions.

Also featured on the technical program this year:

- Tim Bremner, vice president of Materials Technology, Hoerbiger Corporation of America, Inc., will discuss evolving needs in non-metallic seat and seals, and new materials for valves.
- Dan Devine, valve technology resource leader, Dow Chemical Company, will address consent decree requirements in the chemical industry.
- Carlos E. Davila, PE, product manager, Americas, for Crane ChemPharma/Energy Flow Solutions will address updates that have occurred on MSS SP 144, Pressure Seal Valves and ASME B16.35, the 2013 edition.
- Rick Faircloth, principal engineer, Cameron Valves and Measurement, will update attendees on API Upstream Standard Development.
- David W. Gandy, FASM, Technical Executive Nuclear Materials, Electric Power Research Institute, will talk about advances in power metallurgy and hot isostatic processing in pressure-retaining applications.
- Mike McQuade, senior product manager for Emerson Process Management Valve Automation, will speak on methods and advances in actuation of remote operated valves and automatic operated valves on natural gas pipelines.
- Chris O'Brien, partner with Exida Consulting, will discuss IEC Functional Safety Standards.
- Rich Sobilo, technical authority—Fixed Equipment, BP Whiting Refinery, and Stephen McJones, advisor—Vessels and Piping, BP Products, North America, will suggest how owners might improve fugitive emissions performance.

- Jose Veiga, technical director, Teadit Group, will speak on valve packing and gasket research and development devices.
- Matt Wasielewski, president of Yarmouth Research and Technology, LLC, will talk about current trends within third-party test laboratories.

A tabletop exhibit will feature vendors to the valve and actuator industries, who will show off their latest products and services.

The event will be held at Planet Hollywood in Las Vegas. For information or to register, please visit [www.vma.org](http://www.vma.org) > Meetings > Technical Seminar & Exhibition.

## Next VMA Basics Event is April 2-3, Kansas City

The next Valve Basics Seminar & Exhibits, which is April 2-3, will feature Valves, Actuators & Controls 101 at the Hilton Airport Hotel in Kansas City.

Those who attend will join almost a thousand other individuals who have participated in these valuable educational events. The

newest sessions include solenoids and limit switches, and positioners and accessories, in addition to the core courses on various valve and actuator types.

The basics seminars appeal to a variety of professionals from those who are new to the industry or who need to refresh their knowledge on valves, actuators and controls to experienced professionals looking to expand their knowledge base. They also appeal to many end-user personnel, distributors and suppliers who need to know about the industry.

For information, visit [VMA.org](http://VMA.org) > Meetings > Basics Seminar.



## Conference Addresses Improving Reliability in Refining and Petrochemical

People who care about finding ways to improve the refining industry will gather May 20-23 in San Antonio, TX at the American Fuel & Petrochemical Manufacturers' Reliability & Maintenance Conference and Exhibition.

The 3-day program includes general sessions, technical and management presentations, discussion groups, and structured question and answer sessions on best practices in the industry. This year's presentations cover topics such as effective maintenance organization, productivity, equipment reliability, health and safety, training, environmental control, predictive/preventive maintenance, maintenance and engineering standards, inspection, procurement and innovative reliability technology.

In addition an exhibition gives attendees the opportunity to meet and talk with representatives from companies offering a variety of goods and services to the refining and petrochemical industries.

For information, go to [www.afpm.org](http://www.afpm.org). VM

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# Special 75th Annual Meeting Debuts “Best in the World”

The 2013 annual meeting carried a particularly festive atmosphere as more than 200 people gathered in celebration of the special 75th anniversary of VMA's founding. The meeting was held at The Breakers in Palm Beach, FL, Oct. 3-5, 2013.

In addition to members and guests, numerous past chairs and top award winners attended the celebration and were recognized at the Chairman's Dinner & Awards Gala held on the last night of the three-day event.

At the meeting, outgoing chairman Mark Cordell, president, Distributed Valves, Cameron Valves & Measurement, passed the gavel to incoming 2013-14 chairman Ivan Velan, who is executive vice president of Velan. Other officers and board members for 2013-14 approved by vote at the association business meeting were:

- Vice Chairman: Greg Rogowski, Mueller Company
- Program Chairman: Bob Kemple, ASCO Valve – Emerson Industrial Automation
- Immediate Past Chairman: Mark Cordell, president, Distributed Valves, Cameron Valves & Measurement
- Newly elected to the board for three-year terms were:

Mark Nahorski, PBM; Bryan Burns, DeZURIK; Jeff Drees, Flowserve; and Patrick Dunn, Metso Automation USA.

Recognized for outstanding service on the VMA Board of Directors were outgoing directors: Sam Benardo, AUMA Actuators; Don Curtin, Conval; Doug Dunn, Metso Automation USA; and Bruce Broxterman, Richards Industries.

## ED HOLTGRAVER WINS TOP AWARD

Ed Holtgraver, founder and CEO of QTRCO, Inc., was named “Person of the Year”—VMA's highest honor—during the annual VMA meeting.

Holtgraver has been in the valve and actuator industry for many years, and has been an active member of VMA for more than 25 years. He has served on a number of industry councils and committees, including the VALVE Magazine editorial review board for a decade. Holtgraver has been a member of the VMA Board of Directors since 2008 and for the past four years he has been the actuator lead for VMA's successful education and training program.

In addition to that award, VMA Service Awards were presented to Kevin Kemerer,



Ed Holtgraver (left) receives his award from VMA President Bill Sandler (right). At Ed's side is his wife Gloria.

Precision Pump & Valve Service; Bill Metz, Richards Industries; and Mike Rooney, Emerson Process Management.

The Wm. Powell Company was recognized for being the only company that has been a continuous member since the organization formed in 1938. Randy Cowart, chairman/CEO, accepted on behalf of the company.

## BEST IN THE WORLD

As part of its 75th anniversary activities, VMA launched a public relations campaign including a video, “VMA Members: Best in the World,” which premiered at

the gala. The video, in which members discuss why they belong to VMA and why users would do well to work with VMA member companies, is one component of the many activities and projects instituted to recognize and honor the 75th anniversary. The video can be viewed on [www.vma.org](http://www.vma.org).

A special 75th Anniversary Commemorative Program was released during the annual meeting and is now available in The VMA Store. There also is a special section of the VMA.org website dedicated to information about VMA's 75 years that offers a series of articles about industry icons, the history of the organization, timelines, an historical photo archive and much more.

Next year's annual meeting, which is open only to members of VMA and VRC (Valve Repair Council), will take place at the Ritz-Carlton Dove Mountain in Arizona. VM

Mark Cordell (right) hands over the gavel to Ivan Velan (left).



## LEARN VALVE BASICS ONLINE



The highly anticipated release of VMA's Valve Basics Online Training occurred in early November, and one student has already graduated.

That person is David Shue, who completed the course just four days after it was launched. Shue, who is Valve Group Lead at The American Group of Constructors, received his first valve maintenance and repair card in 1998. For the online VMA course, he will receive a Certificate of Completion awarding him six continuing education credits.

Asked whether the program met his expectations, Shue replied: “Yes, and I would definitely take more courses if you offered them. I also teach a control valve course for pipefitters, and I learned new things that I can use there as well.”

For more information, visit [VMA.org](http://VMA.org).

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□ A worker installs compression packing in a plant.

### Executive Summary

**SUBJECT:** Compression packing is one of the most common types of sealing used by industry. But choosing the best solution requires knowing what factors go into reducing friction.

#### KEY CONCEPTS:

- Materials of construction
- Factors that affect different applications
- How to calculate friction factors

**TAKE-AWAY:** The best solutions for control valves involve choosing both the right product and the right packing.

# Reducing Compression Packing Friction in Valves

BY WAYNE EVANS

Compression packing is found in applications ranging from transmission of natural gas and water to caustics and high-temperature steam. When used properly, it is a cost-effective, high-performance means of sealing. Unfortunately, compression packing creates friction, which can cause major issues in certain applications. Knowing how to reduce that friction can be critical in minimizing those issues.

### WHAT'S USED AND WHY

Users of air- and motor-operated control valves (AOV and MOV) generally desire low-friction packing that allows accurate, efficient and consistent actuation while maintaining an effective seal on media. The frictional force packing exerts on a dynamic surface is mainly a function of the type of material, contact surface area and compressive load. Although other system variables and inputs also affect friction, they are more difficult to quantify or modify.

Friction reduction strategies involve modifying packing materials, configurations and installation procedures to attain target frictional loads. Different applications have different allowable leakage rates. Effectively sealing one application may call for graphite, while another may require a PTFE-based packing to reduce friction. Users also may have preferences based on cost, logistics or historical performance. There is no single solution to all sealing issues; the strategies discussed here conceptually apply to most applications, but they need to be validated before implementation. Each application will have an optimal solution that takes into account currently available sealing technologies and strategies.

Compression packing serves as a barrier to slow media migration from the higher-pressure system to the lower-pressure surrounding environment where the valve is operating. The sealing mechanism of compression packing is based on a tight fit between the packing and dynamic sealing surface. This fit is created by applying axial compression that causes radial movement of the packing against the sealing surface<sup>1</sup>. Figure 1 illustrates the dynamics of axial compression and radial expansion.

### HOW ESCAPES OCCUR

The magnitude of a leak is determined by system variables such as media, shaft finish, pressure, braid construction and installation, shaft run-out and temperature. An important point here is that friction and sealing are separate, but related issues with regard to compression packing. Typically, optimized solutions are a combination of both of these factors. Hypothetically, one could achieve low friction by not installing any sealing at all; but the result would be a leaking valve. Conversely, excellent sealing could be achieved by welding a stem to the valve bonnet; but the valve could not be actuated. Realistically, then, the factors within an operator's immediate control for emissions include the type and number of packing rings used, proper installation and axial loading.

Friction is not the major consideration in most sealing applications. Generally, fugitive emissions, chemical compatibility and continuous temperature capability are the main criteria for selecting one packing solution or installation strategy over another.

There are several reasons this is true. For example, in the petrochemical industry, fugitive emissions are of greater concern than friction in isolating valves. In the solar industry, solar companies are operating valves at 1,000°F (538°C) in molten salt, so they are more interested in temperature and chemical resistance.

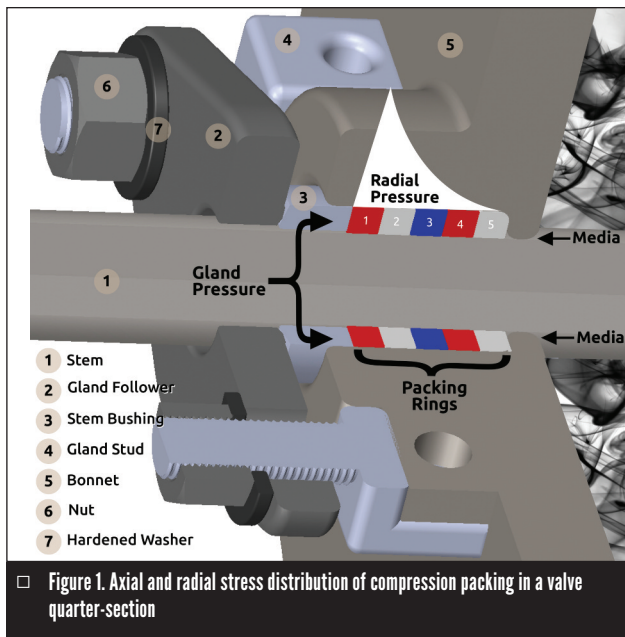


Figure 1. Axial and radial stress distribution of compression packing in a valve quarter-section

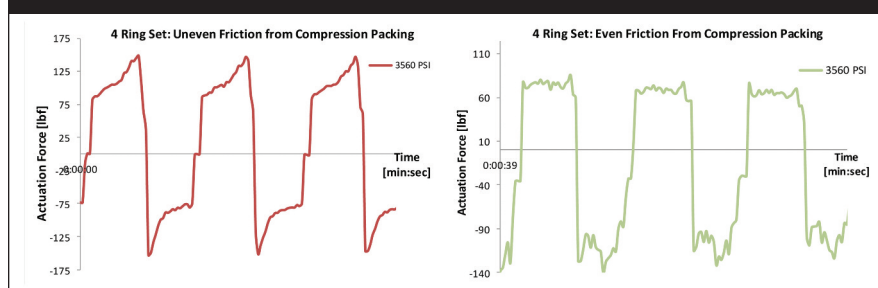
In applications involving AOV and MOV, the size of the actuator required to effectively move the stem needs to be determined. Correctly sizing the actuator requires knowing the frictional force exerted by the seal as well as the force needed to control the media stream. Control valves require consistent friction to accurately modulate process flows.

Another factor that must be considered is "stiction," a term used to describe an actuating stem catching periodically on the packing set and causing the stem to move erratically. This leads to issues in effectively modulating flow. Figure 2 depicts a sample packing set that does not exert consistent friction on a stem versus a set that achieves that consistency.

### REDUCING FRICTION

There are three basic strategies for reducing friction while maintaining an effectively sealed system. These include reducing the load on the pack-

Figure 2. Examples of even and uneven friction exerted on a reciprocating stem



ing set, reducing the number of rings and changing the packing material. A simplified formula developed by Electric Power Research Institute (EPRI)<sup>2</sup> for calculating friction on a reciprocating shaft is:

**Equation 1**

$$F = \pi * D * H * \sigma * \mu * Y$$

Where F is friction force (pound-foot or lbf); D is stem diameter (inch or in.); H is uncompressed packing height (in.);  $\sigma$  is compressive stress (psi);  $\mu$  is friction factor; and Y is axial/radial stress factor (commonly 0.5).

Reducing the axial compressive stress ( $\sigma$ ) reduces the radial stress exerted by the packing set on the stem. Figure 3 depicts the same packing set tested at four different loads. The relationship between compressive stress and friction is shown to be about linear in Figure 2. An increase in gland stress is about proportional to an increase in friction as the shaft reciprocates.

For a variety of reasons, the systems for a wide range of applications are over-tightened during installation. Most packing sets have a target stress range for effective performance. Beyond that range, extrusion may occur. If compression packing is effectively sealing the application, applying additional stress serves no purpose and can adversely affect performance. The manufacturer or consulting with the maintenance team can provide the target stress for effective performance. Assuming well lubricated alloy steel bolts are used, Equations 2 and 3 are commonly used to determine loading conditions.

**Equation 2**

$$F = \text{Area} * \text{Target Compressive Stress}$$

Where F is bolt force (lbf); A is gland sealing area (square-in. or sq. in.); and  $\sigma$  is target stress on compression packing (lbf/sq.-in.).

**Equation 3**

$$T = \frac{.2 * F * \varphi}{B}$$

Where T is required bolt torque (in.-lbf); F is bolt force (lbf);  $\varphi$  is nom-

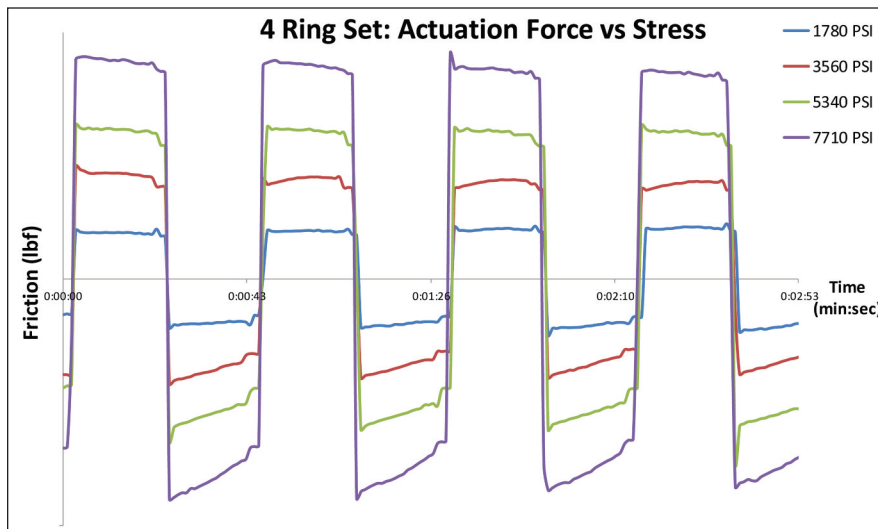


Figure 3. Actuation force vs. compressive stress

inal bolt diameter (in.); and B is number of gland bolts.

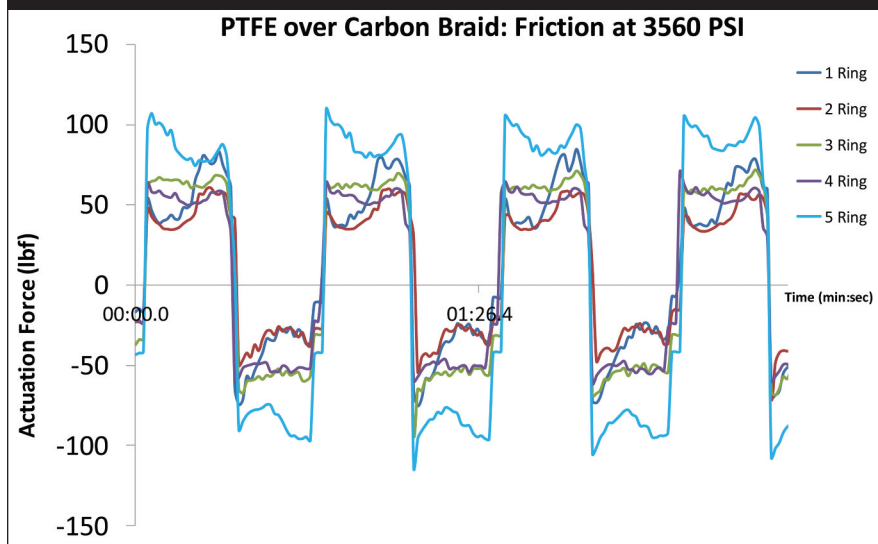
Reducing the number of rings in a packing set limits the contact area with the shaft. In Equation 1, this lowers the uncompressed packing height (H), which is proportional to a lower frictional force. In theory, most of the applied stress impacts only the two rings closest to the gland follower. These rings provide most of the sealing effectiveness; the remaining rings provide little sealing, but add to the overall frictional force exerted on the moving shaft.

Figure 4 charts actual test data correlating the number of packing rings with required actuation force. Adding rings increases friction, but this is not a linear relationship, and it varies significantly

from braid to braid depending on the material and construction. Removing rings can pose potential issues with spacing and sealing effectiveness. Spacing can be maintained by installing carbon or steel bushings that maintain the height of the packing set without contacting the shaft. The number of rings required for a seal depends on the application and should be determined by those familiar with the system.

Changing the packing material to one with a lower coefficient of friction (COF) reduces friction. In Equation 1, the friction factor ( $\mu$ ) quantifies how the packing material resists movement on the dynamic sealing surface. A friction factor is not the same as a COF, however. Friction factors are lumped variables describing friction for a spe-

Figure 4. Actuation force vs. number of packing rings



ific configuration or braid. This is different than the COF, which describes an inherent material property. Friction factors vary for different types of compression packing.

For example, a PTFE-based braid may have a published value of 0.08; a graphite braid with lubrication might be about 0.09; and a die-formed graphite set may be near 0.1. These friction factors vary from actual values because of manufacturers' safety factors, consideration of worst-case scenarios, and averages over different sizes and styles of braids. Figure 5 shows the actuation force required for a four-ring set of 3/8-in. PTFE-coated carbon fibers, a die-formed pure graphite set, pure PTFE fiber with a lubricant dip and PTFE fiber braid with lattice construction.

### MATERIALS OF CONSTRUCTION

Graphite and PTFE are the predominant low-friction materials for compression packing. PTFE is a highly lubricious material, but is limited by its 500°F (260°C) temperature rating, as well as by high creep and flow characteristics. Graphite can withstand temperatures of up to 850°F (454°C) in oxidizing atmospheres and 1,200°F (649°C) in steam atmospheres. Both these materials can be used as the dominant material of construction or can be added to reduce friction. Graphite, PTFE and other polymers and lubricants are commonly added through a dip or dispersion to reduce friction during operation. They

also can be manufactured into pure PTFE or graphite sealing products.

Typically, graphite is formed into a sealing product by die-forming flexible graphite foils into solid rings. PTFE can be formed into fibers and braided, similar to other fiber braids. PTFE and graphite materials also can be processed with other fibers and fillers to optimize desired characteristics such as lower friction and resistance to extrusion. For example, a thin coating of PTFE on carbon or graphite braid can significantly reduce friction, while the carbon core maintains the structural integrity and creep resistance of the braid.

Another sealing solution is to use die-formed graphite sets with angular planes that promote radial movement, which minimizes the compressive load required to seal effectively. This reduction in compressive load coupled with graphite's soft material properties creates an effective seal and a reduced frictional load on the traveling stem. Rather than applying a high frictional force, soft graphite rings will deform to a balance point between the shearing frictional force and the material strength. In addition, the reduced compressive load required for sealing means the end rings, typically a more robust braided material, see less compressive load and subsequently apply a lower frictional force on the traveling stem. Referring to Equation 1, this generally means less frictional force is generated using a die-formed set in comparison to an equivalent braided material. PTFE over carbon

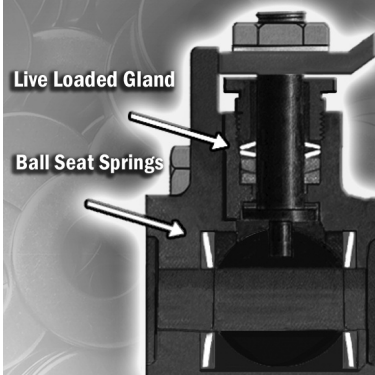
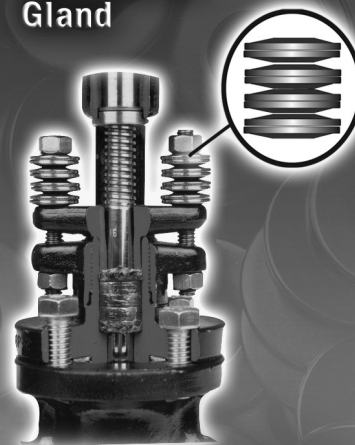
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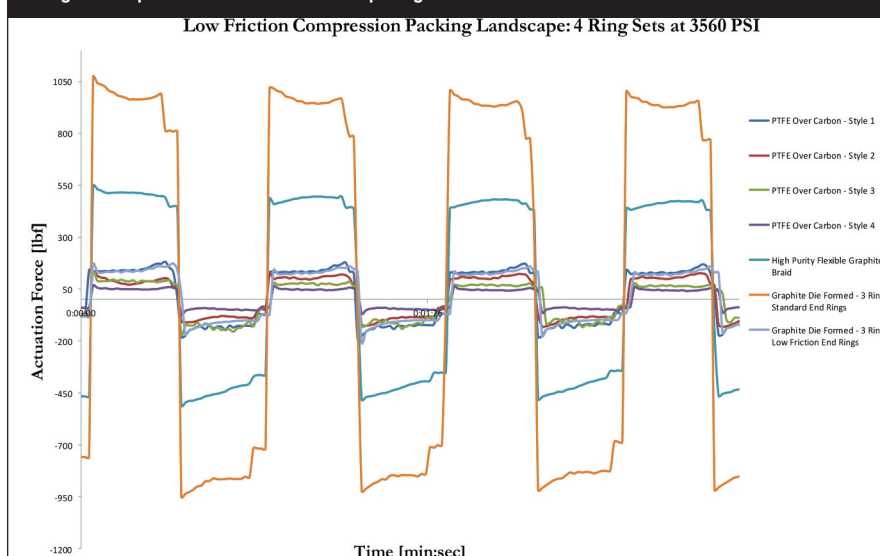
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□ Figure 5. Required actuation force for various packing materials



## TESTING PROTOCOL

### Functional Frictional Test for Compression Packing

Shaft Finish	Stem Reciprocating Speed	Stroke Length	Load Cell Calibration
Plunge Ground 32 RMS	0.75 inches/second	12 inches	+/- 2 lbf at +/-1000 lbf

#### Notes:

- Typically 3/8-in. or 1/4-in. braid is tested
- Calibrated torque wrench
- For die-formed sets, perform three loading phases: the bottom end ring, the die formed set, then the top end ring
- For sets over 4 rings, seat sets every 2 installed rings

#### Method for 4-Ring Set:

- Use appropriate solvent and/or abrasive pad to remove all residue from previous test
- Install 2 rings
  - Compress to 1,800 psi gland stress
  - Remove gland follower
- Install next 2 rings
  - Compress to 1,800 psi gland stress
  - Measure gap on left stud and right stud
- Actuate 25 times while acquiring data from load cell
  - Measure gap on left stud and right stud
- Compress to 3,560 psi gland stress
  - Measure gap on left stud and right stud
  - Actuate 25 times while acquiring data from load cell
- Compress to 5,340 psi gland stress
  - Measure gap on left stud and right stud
  - Actuate 25 times while acquiring data from load cell
- Compress to 7,710 psi gland stress
  - Measure gap on left stud and right stud
  - Actuate 25 times while acquiring data from load cell
- Continue actuating for 300 cycles while acquiring data from load cell
  - Measure torque on left stud and right stud
  - Measure gap on left stud and right stud
- Remove gland follower and document condition of each ring
  - Inspect for extrusion, braid wearing, chemical attack, etc.
  - Note condition of each ring and location within set

exhibited the lowest friction of the braids tested in Figure 5.

#### TESTING

There are no standard test methods for friction induced by compression packing, so manufacturers develop their own standardized tests for comparing the frictional properties of different products. Standard tests typically measure COF. ASTM G1115-10<sup>3</sup> provides a guide for measuring and reporting COF under specific, controlled settings. However, the results of analyzing a specific portion of braid for friction are not particularly useful since stem friction

in a valve results from the dynamic interaction of constantly changing variables such as lubrication, finish, temperature and cycle number. (See "Testing Protocol" to read the test protocol Garlock developed using friction factors and simulating actual applications to compare the field of products.)

There are other factors that directly impact the friction generated by a compression packing set, but they are more difficult to measure and control in the field than a simple change of packing material. Among them is shaft finish, which is recommended at 32 micro inches (AARH) or better on a

reciprocating valve stem. Run-out of a stem or traveling shaft unevenly loads and unloads the packing, potentially exceeding the limits of the material's compressibility and recovery properties, which detrimentally affect sealing. In addition, the gland follower may interfere with the traveling stem.

Improper installation is the most common cause of sealing failure, so proper installation is of critical importance for compression packing. Installation issues can adversely affect applications such as AOV and MOV control valves, which require low, consistent frictional force for efficient performance and lower long-term operating costs. Typically, there is no torque issue with MOV units, but friction impacts accuracy and power usage. The distributor or manufacturer of a particular sealing product should be consulted for best practices in installation.

The required actuation force on a valve's actuating mechanism depends on several factors. Selection of the best sealing solution for a particular application must take into account the key parameters that affect that force, most notably size, temperature, application, media, pressure and speed (STAMPS).

- **Size.** There are standard sizes for many components: for example, API valve stems. Non-standard sizes should be conveyed to sealing manufacturers in the form of dimensional drawings. Some applications may require field measurements.
- **Temperature.** A major consideration is the continuous temperature to which the packing will be exposed, including high/low excursions as well as any regular thermal cycling inherent in the process. Note that the frictional heat generated by rotating equipment will increase the temperature of the fluid contacting the seal. Typically, movement does not generate excessive heat in valves. Temperature data will immediately limit the number of viable seals for an application.
- **Application.** Defining the parameters of a particular application requires information about where the seal will be installed.
  - Selection of valve compression packing will depend upon the condition of the stem, temperature and

chemical requirements, whether its motion is reciprocating, helical or continuous, and whether a specific level of leakage must be attained to meet regulatory requirements.

- **Media.** Common chemical nomenclature or trade names are used to identify the media that will come into contact with the seal. Some processes employ secondary media as well. For example, a food-processing line that is flushed once a day with a sodium hydroxide solution calls for a seal that is compatible with both this corrosive medium and the food being processed.
- **Pressure.** This refers to the internal pressure a seal must contain. Most systems operate at fairly consistent pressures, but as with temperature, it is important to know if the seal will be subject to pulses and other variations as a normal part of operation.
- **Speed.** The speed of a rotating shaft or reciprocating rod must be taken into account when selecting compression packing for dynamic applications. High speeds call for sealing materials that can withstand and effectively dissipate frictional heat. Speed is typically not a factor for valve applications.

Armed with this data, the best combination of product and sealing strategy can be determined for minimizing friction and more effectively operating control valves.\* VM

WAYNE EVANS is product development engineer for Garlock Sealing Technologies ([www.garlock.com](http://www.garlock.com)). Reach him at [Wayne.Evans@Garlock.com](mailto:Wayne.Evans@Garlock.com) and the rest of the Garlock Engineering Team at 800.448.6688.

\*AUTHOR NOTE: A good paper that summarizes some of the points made here is "How stem finish affects friction and fugitive emissions with graphite-based control valve packing," by James Walker, presented at Valve World 2010. <http://www.jameswalker.biz/en/pages/100-technical-papers>

## END NOTES

<sup>1</sup>Fluid Sealing Association. "What is the Impact of Packing Friction on Equipment Performance?" February 2009. Web. [www.fluidsealing.com/sealingsense/Feb09.pdf](http://www.fluidsealing.com/sealingsense/Feb09.pdf).

<sup>2</sup>EPRI: Electric Power Research Institute. "6.4.2 Initial Friction Results." EPRI - NP 5697. 1988. Print.

<sup>3</sup>ASTM International. "Standard Guide for Measuring and Reporting Friction Coefficients1." G115-10. 2010. Print.

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# Nuggets of Knowledge

## Industry Veterans Share What They've Learned

BY KATE KUNKEL

No matter what industry or line of business people are in, or how long they have been on the job, they never stop learning. Those lessons come both from new education and the school of hard knocks. In the valve industry, young professionals have the benefit of being able to learn from many veterans. The industry has a long history and is well-established. At the same time, its veterans are looking down the road and realizing young blood is needed to continue to make the valve and actuator industry a strong one.

We spoke with several veterans of the valve industry and the end users with whom they work to collect some golden nuggets of advice and information. What they had to say will help both those just starting a career and those who have been in the field for many years.

### SEEK ANSWERS

Kevin Kemerer, an attorney with Precision Pump & Valve Service, is a veteran of many years. His top advice is: be constantly on the lookout for answers.

"Being a lawyer, I ask a lot of questions, and I tell people, never be afraid to look a little stupid or silly. It's important to realize what you don't know as well as what you know," he says.



**"It's important to realize what you don't know as well as what you know."**

— Kevin Kemerer

Jeremy Berg, the automation, electrical and instrumentation manager at Cargill Grain and Oilseed Supply Chain, North America, has similar advice.

"You can learn more from a mistake than from doing something correctly the first time. I had a few cases where I sized the wrong flowmeter or valve and ended up with a system that wouldn't work." However, what he learned was not how wrong he was, but how to do it right.

He points out that, while it's better not to make mistakes in the first place, paying attention to what happened teaches people more about the process.

Berg also points out to young people that they are never expected to know all the answers right from the beginning.

"There's always somebody out there who can help, and not enough people will use the resources that are available," he says. "It's much easier to prove yourself by asking questions and



**"Customers don't care about you or your product; they care about how you can help them."**

— Alan Veteto

### Executive Summary

**SUBJECT:** Veterans of the valve and actuator industry have the best advice for the many new professionals coming onto the scene.

#### KEY CONCEPTS:

- Getting into the field
- Being successful
- What veterans have learned
- Advice to others

**TAKE AWAY:** The industry offers myriad opportunities for those who know how to bring their own personal value to the picture.

doing a project correctly than by trying to re-invent the wheel," he adds.

Alan Veteto, national sales manager at Bettis, Emerson Process Management, who has nearly 30 years in the business, adds, "It's not just in the field where it's important to ask questions."

He points to the example of a sales call where mistakes could have been avoided had he asked a few questions before he went into the meeting.

"I had worked a long time to get an appointment with a couple of VPs at this end-user company, and I went into the long-anticipated meeting with a salesperson for our company-owned distributor. I had a plan for what to cover, but when the salesperson got in there, he just launched right into a product presentation," he says.

Veteto realized he should have asked the salesperson before the meeting what was going to be covered.

"These were senior guys in the organization we were meeting with and their time was very constrained. After three to five minutes, their eyes glazed over. They were mentally onto the next thing in their day, and I couldn't find a way to interrupt this guy and get him to stop talking. It was a total waste of their time and mine," he said. The lesson learned was to remember that: "Customers don't care about you or your product; they care about how you can help them with whatever problem or situation they have."

#### LEARN TO COMMUNICATE

Several of the veterans interviewed for this article point out the importance of clear communication, and Kemerer says the problem is particularly troublesome with the latest generation of professionals.



**“Good communication will benefit customers, vendors, peers and managers and in the long run, help individuals advance in their careers.”**  
— Heidi Eland

“You have to be able to converse, to talk to people. That is becoming lost in an age of computers, e-mails and texting,” Kemerer observes.

Heidi Eland, marketing manager for Solon Manufacturing Company, seconds that thought. Heidi has been in the industry for almost 19 years and started her career in customer service. “With our growing, fast-paced technologies, effective communication is suffering,” she says. A clear understanding of what’s being said is vital to all facets of business and industry, she emphasizes.

“Good communication will benefit customers, vendors, peers and managers and in the long run, help individuals advance in their careers,” she says.

While communication is important to every facet, Veteto also pointed out that each aspect of business has its own unique set of qualifying communication skills.

For example, “When you’re in sales, people often think, ‘Oh, he’s got the gift of gab, he’ll be great in sales.’ But that’s not the best thing for a salesperson,” he said.

Instead, “A salesperson needs to be a better listener than a talker. He or she must dig out the real points the customers have, and apply the products and services they’re responsible for selling in a way that shows value to that customer. Truly successful salespeople identify the customer’s point of pain and offer a solution,” he says.

#### FIND MENTORS

Another golden nugget from veterans to newcomers is to have a trusted mentor that knows how to avoid serious gaffes and smooth out the road to success.

Ed Holtgraver, founder and chairman of QTRCO, reached back into his own experience to recall advice he received from one of his mentors. Holtgraver had asked the person how a go-getter could ever hope to compete against everybody else in the quest to move ahead.

“He told me, remember, you’re not competing against everybody. Not everyone wants to get the corner office or succeed by your definition.”

Veteto also recalls benefitting from powerful mentorships. “I’m very grateful for their advice over the years,” he says. “I remember Tom Comstock, who was president of Keystone Valve USA at the time, saying to me, ‘let people know you care about them and they’ll take the hill for you.’ And, I can’t remember who actually told me this, but when I was fairly new in sales in the valve industry, somebody told me: whenever you go see a



**“As a design engineer, everything I did, I did enthusiastically.”**

— Ed Holtgraver

customer, always have something to offer. Always bring value—never be just a commercial visitor. That’s something I’ve taken with me throughout all these years.”

Mark Cordell, president of Distributed Valves for Cameron Valves and Measurement and immediate past chairman of VMA, says he was in the middle of his career when he found someone who helped him learn an important lesson for moving forward.



**“Don’t lock yourself into a piece of the business and not be open to everything else.”**

— Mark Cordell

“I had a mentor who taught me that you have to have a good grasp on all pieces of the business—operations, sales, production and finances,” he says. “I would tell somebody coming into the business today, if you entered a company in a certain area, such as sales, don’t be afraid to move into other areas. Try to get an overall balance of experiences. Don’t lock yourself into a piece of the business and not be open to everything else.”

#### EMBRACE CHANGE

Like Cordell, M. Macit Cobanoglu, vice president of Aecon Nuclear, believes that it’s important to have experience in many areas. Cobanoglu, who has been in the nuclear industry since 1978, made a major lateral move in mid-career to get that exposure.



**“I think too often technical people are afraid to take chances.”**

— M. Macit Cobanoglu

“I entered nuclear as an engineer, and worked my way up. It wasn’t until the midpoint of my career that I decided to move into the commercial side. I think too often technical people are afraid to take chances. Technical is their field, and that’s where they feel comfortable. But I would say, don’t feel that you have to stay there just because that is where you started.”

Professionals warn, too, that young people need to learn to embrace change, even when it’s caused by political or corporate pressures, and to look for the opportunities that result.

“You have to enjoy what you’re doing, and feel like you’re accomplishing something,” says Holtgraver. That may mean considering changing jobs, but he cautions not to change too frequently, and to do so for reasons of gaining experience, not better pay.

Cordell agrees and says that too many young people are in such a hurry to succeed, they think if they’re not constantly being promoted, they’re failures. “You can’t learn everything in eight months,” he cautions. “Give it some time!”

#### KNOW YOUR WORTH

Veterans also say that professionals need to learn what they’re really worth to their employers.



**“Being willing to develop good working relationships with people that have different backgrounds prepares a person for management.”**  
— Albert Cooke

“Too many people want immediate compensation for anything they see as outside their job function, yet it is doing these extra things that convinces those above you that you are worthy of advancement,” Holtgraver says.

“As a manager, it always turned me off when somebody would say, ‘How much am I going to get paid for this?’” he adds.

Holtgraver says young professionals need to learn from veterans how to perform above their pay scale and focus upon doing a good job instead of money.

“As a design engineer, everything I did, I did enthusiastically,” Holtgraver recalls. “There was another engineer in the department who was obviously a much better technical engineer than me. But when our boss got fired, I was the guy who got promoted, not because of engineering skills but because I was enthusiastic and willing to do it all.”

Veteto adds that the same is true in sales, “You always want your interactions to be about the customer and what you bring in terms of value. Whether that’s a product or a service, you want to be perceived as a go-to person when someone needs help.”

## BUILD RELATIONSHIPS

One of the most-often given pieces of advice to up-and-coming professionals is to make use of the contacts this industry offers.

David Hughes, director of global key accounts for Pentair Valves and Controls, says, “The level of professionalism in this business is incredible. When I first came into it, I didn’t realize just how many smart, talented people there are. They’re part of the reason I’ve stayed so long. But you have to make the effort to know them.”

Holtgraver adds that, “The relationships you make, the people you know, they’re everything. Always keep a database of persons you meet for future networking, hiring and job seeking as well as knowing where to go to get things done.”

Kemerer emphasizes the importance of involvement in associations for creating those relationships.

“Early in my career, I began attending meetings at VMA. That helped me get to know people, and it forced me to interact,” he said. Belonging got rid of early fears of standing out from the crowd and taught him to embrace his passion for the job and industry.

“There are such great people in VMA, and the young people coming in can be intimidated by that,” he says. But VMA is where many people first develop their networks and to do so requires getting on someone’s radar.

Albert Cooke, a mechanical engineer with the Tennessee Valley Authority since 1975, says one way to keep any job interesting and challenging is to study the different disciplines within the industry. He says the opportunity to work with a wide range of personalities in many areas of the industry is a key to success as a well-rounded professional.

“It’s not just technical differences [between different disci-

plines], it’s personality. Some of us like field work, others are more into R&D, system engineering, system programs,” he says. Being willing to develop good working relationships with people that have different backgrounds prepares a person for management.

## WHAT THEY WOULD DO DIFFERENTLY

When people are asked what they’d do differently if they had to go back and start over, most come up with a few mistakes that were learning lessons both personally and for their companies.

Hughes says he would go to work for a manufacturer earlier in his career and would recognize global possibilities that manufacturers present.

“I didn’t realize [when I was new] that manufacturers took such an interest in creating career paths for promising young people, allowing them to grow, travel and earn a good living. I realize now that I could have gotten more involved in a global role earlier on,” he says.

Mark Cordell also wishes he had known that global economics was going to play such a big part in everyday business.

“I think that if we knew that our economy would become more global, we might have done things a bit differently, looked at other countries and customs,” he says. “After all, in America we tend to think that the world revolves around the dollar, but that’s not the case, certainly not now. I think if we had known then how much different things were going to be, we would have taken the time and prepared more for this.”

## OPPORTUNITIES AND REWARDS

Without exception, everyone interviewed for this piece was vocal in their enthusiasm for the industry, and recommended that young people consider it as a challenging, rewarding occupation.

Cooke retired five years ago, but came back to work because he feels it keeps him young. He says, however, that he is concerned about the lack of recruits to work in the valve world. “I’ve trained four sets of engineers, but they don’t last more than a couple of years. In the nuclear industry, as a valve engineer or technician, you get hot and dirty. It’s not and never will be glamorous. But you will always be learning, and you will never be out of work,” he says.

Cobanoglu agrees and adds that, “There are a lot of well-paying jobs in nuclear, whether in construction or operations. We are always looking for young engineers and technicians.”

Hughes, who was helped along in his entry to the industry by his family connection, says he’s come to learn what opportunity there is. “Besides the great people, the other thing I did not realize is how profitable this business is. It has given me and many people I know a terrific living.”

Veteto also pointed out that the industry is not just a “males only” business anymore.

“There is a ton of opportunity for both men and women. Over the decades I’ve been in it, the barriers are virtually gone, and whether it’s sales, engineering, manufacturing or supply chain, if you bring your own personal value proposition, you will be successful.” ■

KATE KUNKEL is senior editor of VALVE Magazine. Reach her at [kkunkel@vma.org](mailto:kkunkel@vma.org).



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# Wireless Solutions Keep Close Watch on Valves

BY MIKE LUTOLF

The number of valves and valve types that go into modern process plants today to precisely control operations is huge. Because of the critical role they can play, the increasing numbers mean a corresponding increased need to monitor how well these valves operate. Yet in too many cases, this does not occur. The lack of information coming from a large proportion of today's valves can lead to poor performance and inefficient operation. One of the tools at our disposal to achieve effective valve monitoring is wireless technology.

## THE NEED

The need to monitor valves within modern process plants is greater than ever. A malfunctioning valve or one that is incorrectly left open, closed or partially open can result in health and safety risks, affect plant performance and lead to environmental damage. In some of today's industries, there are also regulations that may require constant recording of valve positions. Plant operators strive to monitor the greatest number of valves possible both to increase efficiency and keep personnel and the environment safe. By continuously monitoring a valve, these operators benefit from enhanced production control, reduction of errors in the process and improved safety of the process line.

## Executive Summary

**SUBJECT:** As the need to monitor valves grows, manufacturing operations require more ways to monitor individual valves. Wireless technology can meet that need while providing benefits over more traditional methods.

### KEY CONCEPTS:

- Why monitoring is increasingly important
- How it's done
- Benefits of wireless
- Challenges of wireless

**TAKE-AWAY:** Different applications have different needs. Plant operators must assess which technology will best meet demands.

The weight of each of these benefits depends on the industry. For example, of all the major incidents and accidents in the refining and petrochemical industry, about 30% result in injury or loss of life, while over 60% lead to regulatory fines and production downtime.<sup>1</sup> These incidents not only have an impact on the safety of the people at the plant, they can result in substantial costs through reduced efficiency and downtime. While the dangers and cost may not be a direct result of insufficient valve monitoring, understanding the status of each critical valve, especially if it can be achieved in real time, can greatly reduce the risk of an incident.

### CONSEQUENCES OF UNMONITORED VALVES

In a typical process environment, more than 55% of valves are manually operated, and many of these are unmonitored. Around two thirds of the remaining valves are unmonitored because of the expense or difficulty in setting up a monitoring system, resulting in a situation where 70 to 85 valves out of every 100 are unmonitored. This means personnel must physically inspect valves at regular intervals to ascertain their status. Without the ability to monitor remotely, valve inspections may be done unnecessarily, plant engineers may be put in dangerous inspection situations, or the number of times a valve is inspected may be limited because of the difficulty in reaching that valve.

In a major study, about half of valve incidents resulting in leakage were attributed to “operational issues” (not valve defects or malfunctioning). Almost 30% of these operational issues were the direct result of a valve simply being left open or wrongly opened without notice.<sup>2</sup>

Most plant operators deal with these situations every year. Since the majority of valves are unmonitored, events can go undetected for long periods of time, depending on the maintenance schedule. This can cause significant operational losses in addition to environmental and safety risks.

<sup>1</sup> Reducing Major Accident Potential: Lessons from the Refining Industry, DNV Energy

<sup>2</sup> Assessment of valve failures in the offshore oil and gas sector. National Engineering Laboratory, on behalf of the Offshore Division of Health & Safety Executive. UK Offshore Oil & Gas Industry



□ This piece of equipment alerts the plant if there is an issue.

### TRADITIONAL MONITORING

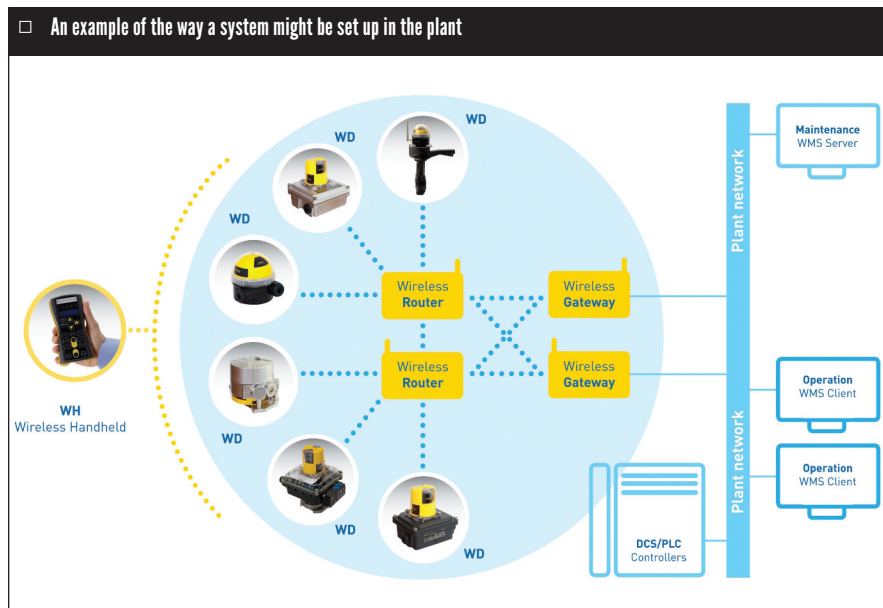
The complexity of modern processes means it is increasingly difficult to monitor all valves at all times. Some plants have turned to traditional automated monitoring systems that rely on a wired network. But as the number of valves that need monitoring increases, so does the burden put on the system, which means more need for wires, cable trays, cabinets and input/output devices. In projects with severe space constraints, such as offshore platforms, housing additional hardware becomes a challenge. In applications where air conditioning, heat or extreme temperature control for hazardous chemicals or nuclear radiation is required, the need to find room for more hardware for monitoring becomes even more challenging.

Also, because of the complexity and large number of required parts, wired systems can cost between \$2,000 and \$5,000 per valve for installation. In harsh environmental conditions, failures can result because of wires exposed to those conditions. Maintenance costs add to the initial outlay installation costs because wires can wear and break, connections can become loose, and repairs must be carried out by trained personnel.

### WIRELESS VALVE MONITORING

To overcome the challenge of monitoring all valves within a plant, a number of manufacturers have developed wireless valve monitoring systems. A wireless network can make it possible to monitor all types of valves in the facility and deliver comprehensive data relating to valve performance and status in real-time.

These wireless valve monitoring systems use radio signals and a networked system of field monitoring devices. The technology is integrated with distributed control systems, programmable logic controllers and supervisory control and data acquisition systems to provide real-time information on valve status as well as flow, temperature and density conditions through wireless transmitters. The network comprises a wireless device at the valve, a wireless router and gateway connected to the plant’s network maintenance and operations functions. Integration with the plant network is facilitated with open



□ An example of the way a system might be set up in the plant

protocols such as open process control, Modbus remote terminal unit/transmission control protocol and Profibus. To add to effectiveness, there usually are a variety of options available such as multiple housing configurations, high visibility beacons, intrinsically safe and explosion-proof options, and direct mounts to valves and actuators.

#### HOW IT'S DONE

Typically, a valve monitoring wireless device is mounted to a valve and reports that valve's position at regular intervals, such as every 15 minutes or following every valve movement of at least 1.5 degrees. This enables creation of valve signatures for automated valves. The device also monitors temperature, battery status and alarms, and messages are transmitted with a real-time stamp. It is then possible to detect whether a valve opens too quickly or slowly, as well as monitoring patterns over time because the diagnostic data is embedded in the valve signature. Maintenance can be planned, and incidents can be investigated immediately.

Reliable wireless valve monitoring

## Wireless valve monitoring systems offer many advantages including costs 25–60% lower than conventional wired systems.

systems also should be designed for low power consumption and immunity from background interference. This allows reliable readings and long battery life for the wireless units. Field devices also should be configured using a mesh network topology to ensure full redundancy and to avoid any single point of failure, thereby ensuring the highest level of effective valve monitoring at all times.

In most circumstances, a simple configuration through routers can be done so that 100 valves can be installed per gateway. Plant operators can then add 10,000 valves through up to 100 wireless gateways that can be connected per server. Without routers, about 30 valves per gateway can be connected.

Handheld devices allow local communication with the key components of

the system, including the wireless device, the router and the gateway. Intended for use at close range, wireless handheld devices are used to calibrate and set up each wireless device, configure operator identification and passwords, turn units on and off, and prompt transmission confirming a valve's status. This makes troubleshooting in the field efficient. By allowing plant operators to operate the system locally and remotely, the signal level can be measured with control and flexibility.

#### ADVANTAGES OF WIRELESS

Wireless valve monitoring systems offer many advantages including costs 25–60% lower than conventional wired systems. This is because of lower cost of installation (the wires and routing), which usually accounts for about half

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the monitoring cost. Reduced installation cost can also mean a greater number of valves can be monitored for the same capital investment. In most cases, wireless technology can triple monitoring instrumentation in a typical process plant, which can improve plant safety and efficiency.

Wireless monitoring systems are easier to engineer and install than wired, thanks to the simplicity of the design and the need for fewer parts. This also allows rapid commissioning, calibration and startup through the handheld devices, and requires a smaller footprint, providing a good solution for areas with space constraints. Fewer visits to hazardous areas are required, and the number of unwarranted inspections is lowered, saving labor costs.

Without monitoring, the efficiency of an automated valve is difficult to assess. Wireless valve monitoring provides accurate, up-to-date information on the valve's status at any point in time and will deliver the valve's operational signature, enabling cost-effective predictive maintenance. Wireless monitoring systems also have multiple paths

of communication; if a device fails or a path is blocked, the system finds another route to ensure that data from the valve reaches the control system.

#### LIMITATIONS OF WIRELESS

A variety of factors can limit the performance of wireless valve monitoring systems. These include the distance between the wireless router and each valve's monitoring device and the topology of the plant. If large obstructions are present, they can block communications, either reducing the efficiency of the monitoring or rendering it impossible.

In addition, rain, ice and snow can increase transmission error rates, though there are exceptions depending on how the system is set up. For example, in a mesh environment, a secondary path would be used should the primary path fail.

Performance also can be reduced in hazardous or corrosive environments.

In addition, some wireless systems may not meet full industry standards. Plant operators must ensure that the system they specify is from a reputable

supplier, and that it complies with ISA-100.11a Wireless Network Optimized for Industrial Monitoring.

As with all aspects of a well-run plant, its operators should carefully consider the most appropriate technology for each application to overcome challenges and achieve the most effective monitoring system for their needs.

#### CONCLUSION

Because of the increased complexity of modern process plants and the desire to monitor more valves than ever before, it is clear new solutions are needed to complement traditional methods of valve monitoring. Over the years, reduced manpower, increased legislation and continuing efforts to drive down costs have made valve monitoring systems indispensable. Wireless technology offers a means to monitor more valves than ever before in real time and in many types of conditions. **VM**

**MIKE LUTOLF** is global product manager, controls, Westlock Controls ([www.westlockcontrols.com](http://www.westlockcontrols.com)). Westlock is a division of Pentair Valves & Controls (<http://valves.pentair.com/valves>).



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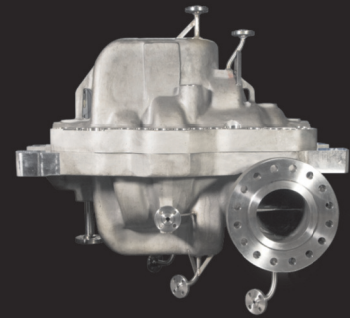
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□ This soybean crush plant in Sydney, Ohio is one of many of Cargill's plants where young engineers now have a standard for buying valves.



# Creating a Standard to Compare Control Valve Products

BY JEREMY BERG

Each enthusiastic young engineer that comes into the workplace wants to reinvent the world. However, when that factor is combined with the reality that the numbers of regional sales offices for valves is growing and growing, the amount of combinations of valves that can be bought and used becomes endless.

## Executive Summary

**SUBJECT:** As the workforce is infused with younger personnel at the same time the numbers of regional sales offices increases, it becomes increasingly difficult to create valve purchasing standards within a plant. This is a first-person account of how an official at Cargill created such a system for control valves, then found it offered many additional benefits.

### KEY CONCEPTS:

- Why the standard was needed
- How it was created
- The benefits

**TAKE-AWAY:** By creating this standardization, the company now has a better way to get quotes.

Inquiring sales people have a host of questions for new engineers—from what materials of construction are required to how to determine temperature ratings, pressure ratings, valve styles, service duty, etc. The sales rep is just doing his or her job in trying to figure out what the customer wants. But in the end, those reps are setting up the young engineer for failure by bombarding them with terms and information they don't yet know. The young engineer then makes a best guess on answering the sales questions, and sometimes he or she chooses a solution that is a special order or does not match the plant standard. Companies need a way to help them out.

### THE ENDLESS COMBINATIONS

I began the process of creating a best practice valve design for young engineers to follow by taking a close look at control valve catalogs and realizing just how many combinations there actually are. If you look just at a standard rotary ball valve, for example, you see two choices for body style but then you have another 16 options for the type of ball. Next, you might see two choices for protector rings and four choices of shafts.

That's followed up with another six choices for both bearings and seals and four choices for packing material. Adding up all those options gives you 36,864 different combinations of valves, and the only thing you would see when standing next to the valve you choose is the body style. This doesn't count looking at the actuator, positioner, diagnostic package, air piping or fail position. Knowing that valves at our facilities faced very easy and standard applications, I knew I needed a way to limit the choices and have the young engineer focus on only the sizing aspects of a control valve.

### MAKING SELECTIONS

To begin the process of choosing a standard valve best practice, I took the datasheets used on a recent project and sent them to a sales office we have used since the beginning of my career. I then compared that office's quote to what I actually ordered on the project. (The initial quote actually came from a sales office I had never used before.) The first thing I noticed was that I could not differentiate between the two quotes on several line items. Yet I

could clearly see they were not the same specifications.

To better compare the two quotes, I reached out to the corporate account representative for the valve manufacturer we frequently use and asked her to go over the quotes with me. We dissected the quotes line by line until we could make a decision for all 110 different lines on the quotes.

As we went through each line, the goal was to fit the valve specifications to our standard valve, which is a mild-service duty valve that doesn't face high temperatures and doesn't need to be made from exotic metals. When we would get to a line item that did not match between the two quotes, we'd pull up the valve catalog and find out all the options that were possible. In cases where multiple options for the selection made sense, we would then look in the database for the manufacturer's valve warehouse and find which item was the most commonly stocked item. We did this so we could choose components that were standard off-the-shelf items, which meant not worrying about a long delivery for emergency part numbers.



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For further information on MSS membership or MSS standards, please contact Bob O'Neill, MSS Executive Director at 703-281-6613 or at [www.mss.hq.org](http://www.mss.hq.org).



The Manufacturers Standardization Society  
of the Valve & Fitting Industry

## ROLLING OUT THE STANDARD

Once all selections had been made on all 110 components to make up the standard valve options, I asked my account representative to put together a quote for me that listed globe, butterfly and ball valves from 1/2-inch to 12-inch in both carbon steel and stainless-steel body construction. I could then take that quote and use it for budgeting purposes on all projects without going straight to the valve manufacturer in the first and second stages of the project development process and get accurate numbers while assuming the valve is going to be line-sized for initial sizing. Once the quote was completed, I worked with the account representative for the best plan of action to assure no matter where in North America I was buying a valve, I would get the exact valve we had just specified.

Her suggestion was to send an email distribution to regional sales offices, then follow that up with a call to each office to discuss the purpose behind the standardization. After she had finished working with the regional sales offices, I reached out to one of my plants in each regional sales office area

and asked them to get quotes on one valve and send me the quotes so that I could see whether or not our new standard had been successfully quoted.

The results came back with great success, and we did not have any regional sales office that had quoted the valve differently than our standard.

To complete the standardization on our end, I worked with one of my regional engineers to develop a checklist sheet that allows young engineers to focus only on those selections that are directly related to the sizing of the control valve and not the material of construction, so they are not inundated with choices. Instead, they know exactly what they need to size a control valve successfully.

## CAPITALIZING ON THE STANDARD

Now that we have been able to fully implement the valve standardization across our business, we have seen several benefits.

On the repairs and maintenance side, we have reduced the number of spare parts we have in the warehouse, making one standard rebuild kit for each style of valve. From the capital

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Our strategic sourcing group has been able to work with the valve manufacturers to increase our discount percentage on the valves, resulting in lower-priced valves for both capital projects and replacement valves purchased on repairs and maintenance budgets.

We also discovered an added benefit: This standardization project, which originally set out to make sure our plants were using the same products for common installations, has led us to a lower overall cost of ownership on valves and a standard valve that is customized for our process. VM

**JEREMY BERG** is an automation, electrical and instrumentation manager for Cargill Grain & Oilseed Supply Chain, North America. Reach him at [Jeremy\\_Berg@cargill.com](mailto:Jeremy_Berg@cargill.com).

*This story originated from a presentation given by Jeremy Berg and Rebecca Turner, key account manager for Emerson Process Management-Fisher, at the 2013 Emerson Global Users Exchange last fall in Grapevine, Texas. For information on the exchange, go to [www.emersonexchange.org](http://www.emersonexchange.org).*

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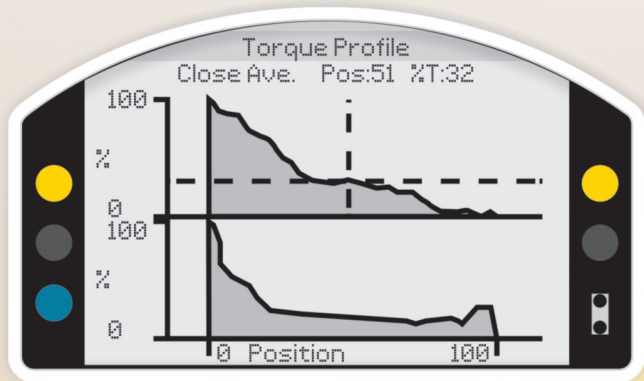
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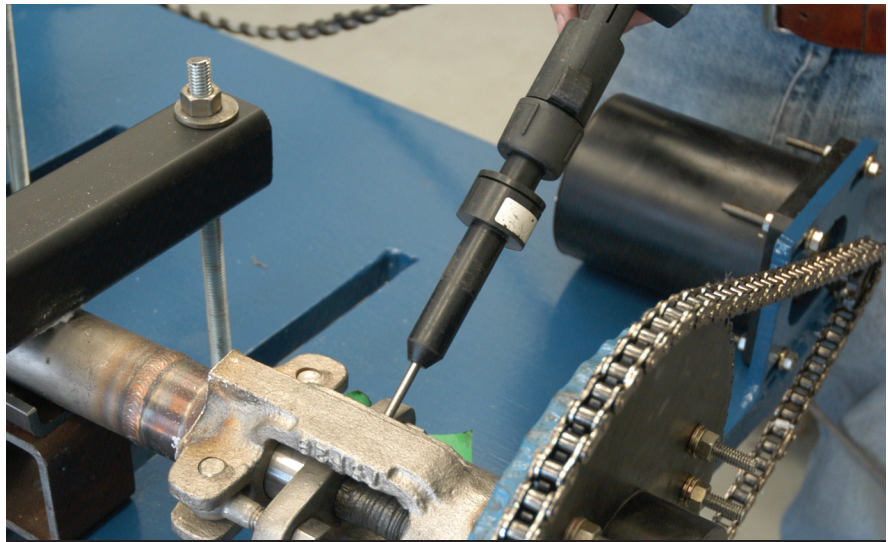
# Rebuilders Beware: EPA Clean Air Requirements Will Affect You

BY GREG JOHNSON

When watching complicated events unfold, it's human nature to sit smugly back and think: I'm glad I don't have to deal with *that*. For many of us in the repair community, this was the reaction when the Environmental Protection Agency (EPA) passed fugitive emissions regulations and valve manufacturers were forced to respond. Until now, we could nonchalantly stay uninvolved in the fracas.

However, the landscape is rapidly changing.

EPA uses consent decrees to "persuade" offending air polluters to clean up their acts. These decrees are a first step response to parties violating various clean air and clean water regulations. In the case of refineries and chemical plants, the decree usually directs the offender to take strong steps toward correcting problems. In the case of valves, that response may be ensuring that all valve purchases are bellows-seal types. More often, it is



□ A technician performs a fugitive emissions test using methane and a methane sniffer. To perform this type of test on every repaired valve would be cost-prohibitive.

simply ensuring that all purchased valves meet low emissions (Low-E) requirements, usually with documented leakage rates that do not exceed 100 parts per million (ppm).

Valves used in places where emissions are a concern must be qualification tested and verified to meet the 100 ppm maximum leakage rate requirement. But the valve manufacturer has to step further out on a limb by guaranteeing this leakage limit *for five years*.

In the case of new valves, the testing process verifies that packing and packing systems are Low-E (less than 100 ppm). The process starts with a packing qualification tested in accordance with American Petroleum Institute (API) recommended practice RP622, Type Testing of Process Valve Packing for Fugitive Emissions. The test protocol is designed to qualify the packing by itself as compliant.

Following a successful API RP622 test, the packing can be inserted into a candidate valve and tested again. The standard for this second test will be the soon-to-be-published API 624, Type Testing of Rising Stem Valves Equipped with Graphite Packing for Fugitive Emissions. This document lists several sizes and pressure classes of valves to be tested so that packing and packing performance in the tested valves is verified as low emissions. One caveat of the standard is that the packing used in valves for the API 624 test must first be verified by an API RP622 test.

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That's fine for new valves, but what about repaired or post-OEM-manufactured modified valves? For many repaired valves, the design tolerances of the valve may be long gone. Therefore, it is now up to the repair facility to create a new Low-E packing system in concert with a low emissions packing manufacturer—and guarantee it for five years.

## HOW TO RESPOND

Where do we start this process for repaired valves? We begin by working with a packing manufacturer that has qualified low fugitive emissions packings in their product lines. This will mean the manufacturer has successful RP 622 test data on the packing. The second step will be to assess quality systems and determine awareness of the dimensional tolerance requirements for these packings to work properly and that our equipment is capable of achieving the necessary tolerances and finish requirements.

Installation and effective use of Low-E packings require stem and stuffing box tolerances different from and tighter than those published in original valve design documents, such as API 600, Steel Gate Valves Flanged and Butt-welding Ends, Bolted Bonnets. This is because when they were originally drafted, the original packing gland and stuffing box design dimensions and tolerances of API 600, 602 and 603 were not designed with 100 ppm sealing performance in mind. The sealability of Low-E packing systems to meet maximum 100 ppm leakage demands much tighter tolerances.

Here are some of the components and dimensions critical for Low-E packing success:

- **Stem run-out**—the variation in stem diameter over a given length
- **Stem straightness**—the lack of linear dimensional stability
- **Stem and stuffing box finish**—the surface finish (roughness) of the stem and stuffing box wall. These can be either too smooth or too rough.
- **Stuffing box inside diameter (ID)**—the diameter of the inside of the stuffing box area that also coincides with the outside diameter (OD) of the packing

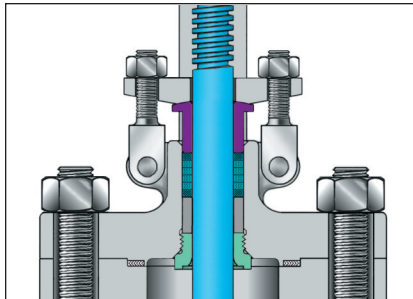


IMAGE COURTESY OF VEMAN

□ The biggest source of fugitive emissions leaks in plants is valves. The valves that leak the most are rising stem valves such as gates and globes. Pictured here is a typical packing area drawing for a rising stem valve, showing the packing, stem, packing gland and packing gland follower and how they interact.

- **Stem OD**—this dimension coincides with the ID of the packing.

If an end-user or ultimate owner is faced with a consent decree, a five-year, 100 ppm guarantee will be required for repaired valves as well. This guarantee will actually be written by the packing manufacturer, but only if there is traceability that individual tolerance requirements have been met and that the packing has been installed in accordance with detailed installation

procedures. These procedures may include very specific torques and/or valve cycling requirements.

Currently, no production testing standard exists for Low-E verification. Hopefully, API or some other standards organization will develop a procedure and acceptance criteria for such a test. One factor that makes such testing difficult is that both the API RP622 and 624 documents use methane as the testing media. For safety reasons, a production test would almost have to use an inert gas such as helium. As of now, there is no correlation between helium and methane leakage rates.

Unfortunately, there will be an added cost for Low-E certified repaired valves. However, if the service is performed correctly in a cost-productive manner, the opportunity and potential profit will outweigh those costs. VM

**GREG JOHNSON** is president of United Valve ([www.unitedvalve.com](http://www.unitedvalve.com)), Houston, and is a contributing editor to VALVE Magazine. He serves as chairman of VMA's Education & Training Committee, is a member of the VMA Communications Committee and is president of the Manufacturers Standardization Society. Reach him at [greg1950@unitedvalve.com](mailto:greg1950@unitedvalve.com).



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## **COMING LATER IN 2014:**

- » **Valve Repair Seminar & Exhibits** – June 5-6, 2014 in Houston at the Marriott Houston South (registration opens in March)
- » **Valve Basics Seminar & Exhibits** – Oct. 30-31, 2014 in Las Vegas at Planet Hollywood (registration opens in June; content is the same as April 2-3 course)

**> Meetings as it becomes available**

# Fire Protection Solutions

BY MIKE HEUSEVELDT

Because of the potential harm and damage to people and property, fires and explosions are a major concern in refinery, gas processing, petrochemical and offshore, and many other types of facilities. Minimizing the danger requires efficiently protecting the systems that control the potentially hazardous areas of those facilities. In many of them, valve operators, gear boxes and associated components are a top priority for safeguarding. This is because proper fireproofing of these components can mean this critical equipment can be controlled during an emergency, thereby preventing catastrophe.

Fortunately, many actuator manufacturers and suppliers today have a range of fireproofing recommendations suitable for their actuators—from fixed passive protection to full fire retardant enclosures. These methods usually provide flexibility so they can be fitted to both new and existing actuators. The systems described in this article allow actuators to continue operating for a significant period of time in fire temperatures of over 1,800°F (982°C).

While this article's scope is limited to actuators and gear boxes, it's essential to note that valve top-works, cables, control entries and other components associated with potentially vulnerable systems must be properly protected as well.

The four main ways to protect valve actuators and gear boxes from fire are: flexible enclosures, semi-rigid enclosures, rigid enclosures and intumescent coating systems.



□ Fire-proofing systems provide a high level of protection for actuators and associated equipment in such critical areas as gas pipeline compressor stations.



□ Figure 1. Flexible enclosure system

## FLEXIBLE ENCLOSURE SYSTEMS (FIGURE 1)

Flexible protective jacket enclosure systems offer a compact fireproofing solution for both actuator and related plant equipment. These systems are widely used, provide easy application and access, and can protect both the actuator and the valve.

Features and benefits associated with flexible fireproofing systems include:

- The jackets can be tailored to suit varying protection levels up to 2,100°F (1,149°C) for 30 minutes.
- They are easy to install requiring no special tools or training.
- The systems remain intact through the duration of the exposure to fire.
- They are easy to remove and re-install for inspections.
- They block the flame path and transfer heat.
- They can be repaired in the field.
- They are weatherproof and robust, but lightweight and cost effective.
- They can be designed to contain actuator, gear box and other plant equipment.

## SEMI-RIGID ENCLOSURE SYSTEMS (FIGURE 2)

The design of these systems needs to be based upon the industry-approved graph of hydrocarbon fire versus temperature curve. The construction of these enclosures will vary with different actuators based on the actuator's thermal mass, physical configuration and limiting surface temperatures.

A typical semi-rigid enclosure sys-



□ Figure 2. Semi-rigid enclosure system

tem consists of a steel sub-frame enclosed in a body of 8 pounds per cubic feet density silicate fiber blanket encapsulated to the inner (cold) face with 11.8 ounces per square yard (oz/yd<sup>2</sup>) glass cloth and to the outer (hot) face with 41.3 oz/yd<sup>2</sup>-weight wire-reinforced cloth. Both of these cloth elements should be coated with an elastomeric membrane to provide environmental protection. Alternatively, the enclosure may be tailored to fit directly onto the actuator body (see information in section on flexible enclosure systems).

The incorporation of special collars into the system accommodate the need for cable entries and penetrations for external declutch lever and handwheel operation, allowing full manual operation of the actuator without the need for removing any fire insulation.

Actuator surface temperature constraints vary in ranges of 158°F (70°C) to 662°F (350°C). Acceptable semi-rigid enclosure systems should be tested to UL1709 at a recognized research center to document that the enclosure can provide protection for the actuator for 30 minutes at up to 2,000°F (1093°C).

Besides these testing requirements, key considerations for semi-rigid enclosure systems are as follows:

- Individually tailored designs can minimize physical space requirements.
- They have low maintenance needs.
- A wide temperature constraint range exists.
- They can be frame-mounted or

- direct-mounted to the actuator.
- There should be easy access to key actuator features such as displays, control knobs and other features.
  - They are durable and weather resistant.
  - Temperature and time capabilities range widely.
  - They can be designed to contain actuator, gearboxes and other plant equipment.

### RIGID ENCLOSURE SYSTEMS (FIGURE 3)

Rigid enclosure systems are easy to handle, yet robust enough to withstand the effects of repeated exposure to minor fires, often in a hostile environment that requires frequent in-service access.

The versatility of the rigid system enables a variety of material options to meet customer specifications. This ensures the design can accommodate difficulties in location and space restrictions. Special features can be incorporated to give direct access to the protected equipment even within these constraints.

Such enclosures are constructed using high thermal performance materials encapsulated within stainless-steel skins. Independent tests are carried out on these enclosures, verifying they pass industry standards.

Besides the testing, here are some key features and benefits:

- They can protect against flame temperatures in excess of 2,200°F (1,204°C).
- They can resist both blast and jet fires.
- Installation requires no special skills or tools.
- They can be retrofitted to existing units.
- They can provide up to 120 minutes of protection.
- They can withstand blast overpressure.
- Panels for inspection and maintenance are easily removable.
- They can be designed to contain actuator, gear box and other plant equipment.

### INTUMESCENT COATING SYSTEMS (FIGURE 4)

Intumescent coating is effective in protecting against fire through basic



□ Figure 3. Rigid enclosure systems

thermodynamic principles and can provide superior protection and convenience. Without protection, a typical

metal surface will reject about 20% of the heat of the fire. With an intumescent coating, 80–90% of the heat can be repelled. These coatings, provided by specialty manufacturers with proprietary formulations, are molded to the actuator.

When exposed to fire, the coating undergoes an endothermic reaction creating an expanded outer layer of lava-like char. The char layer has a very low thermal conductivity coefficient—the surface temperature of the char rises to within 100°F (38°C) of the fire. After the char layer is formed, the coating

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□ Figure 4. Intumescent coating systems

then remains passive, providing insulation and reflecting heat away from the actuator. Additionally, moisture is released during the process, drawing heat away from the layers below.

After a period of time, the heat penetration through the char reaches a level at which the coating material below is activated to form another char layer. This process is repeated several times as heat slowly penetrates and forms subsequent layers of char. These

heat-transfer characteristics result in a very effective thermal barrier.

Considerations with intumescent coating include:

- They protect for more than 30 minutes in 2,000°F (1093°C) fires.
- The original actuator features are intact and accessible.
- They can exceed ANSI/API 607 and UL 1709.
- Minimal space is required.

- They provide fixed passive fire protection.
- They are permanently molded to the actuator and gear box.
- The coating is chemically inert.
- Operation and maintenance can occur without the need for special extensions or removal of panels, etc.
- Segmented coatings allow trouble-free dismantling and re-assembly of the actuator.
- There is minimal maintenance.
- They are durable and weather-proof.

**SUMMARY**

As this article shows, there are several fire-protection options to consider for valve automation equipment. A good place to start in finding the best solution for a particular situation is to ask the manufacturer of the actuator. Don't just choose a fire-protection method because it is used in other areas of the facility. Instead, talk to the manufacturer, do the homework and choose the best method for each specific application. ▀

**MIKE HEUSEVELDT** is marketing coordinator for Rotork Controls, Inc. ([www.rotork.com](http://www.rotork.com)). Reach him at [info@rotork.com](mailto:info@rotork.com).

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# The Expanding Network of Valves

BY GENILEE PARENTE



Sheldon Marstine stands in front of the stocked warehouse supply.

As industry itself reaches into more and more areas of the world, getting the equipment needed to run that industry to the locations and projects where it's needed *when* it's needed has taken on increased importance. Valves, actuators and related equipment today are very much dependent on the distribution network.

The network has changed tremendously over the years, but the future looks rosy and promising for distributors, according to Sheldon Marstine, owner of Zenith Supply, Pittsburgh, PA. Marstine has been witness to what has happened through a long career that stretches back to working for the plumbing supply business his father started in 1946 with \$7,000.

One of the most profound changes is that: "In my early days, the business had many small, independent supply houses, which you just don't see much of today. Between buyouts and mergers, the distribution network has evolved to include some giants and not very many small companies," he says.

It's also changed its face, he says.

"Supply houses used to be like a department store, carrying everything from pipe fittings, valves and ball bearings to scotch tape, ladders and paint. After World War II, the industry began to specialize so that one company would offer a line of ball bearings or

**"As a supply house, I had always been plagued by one problem in particular: finding that esoteric valve—one special product that was in short supply such as pressure seal valves or other high-pressure valves, but that a user needed right then."**

pumps or valves, but nothing else," he explains.

"Then in the 90s, the mergers and buyouts began and now we have distributors with hundreds of branch offices stretched throughout the world often based on where end users are," he says.

## ZENITH SUPPLY

His own company has a different kind of specialization. Zenith Supply serves as a master distributor to other distributors of one manufacturer's products (Velan)—it never sells directly to end users. Marstine explains how that business model evolved.

Up until the 80s, Zenith was a traditional distributor. The recession of the time made him rethink his setup.

"As a supply house, I had always been plagued by one problem in particular: finding that esoteric valve—one special product that was in short supply such as pressure seal valves or other high-pressure valves, but that a

user needed right then," he says.

Knowing that he wasn't the only distributor going through that scenario, Marstine decided to look for a way to offer a product that might not otherwise be readily accessible and began partnering with Velan.

The model that results requires holding a huge inventory, which for Zenith includes just about any valve in the product line that isn't custom-made.

"We have valves here that no other company on the planet probably has on its shelves," Sheldon jokes.

Running a business with this model requires a formula a bit different than the traditional distributor: Price always falls to third in priority, after quality and delivery.

"However, price is also important so we try to be as competitive as possible, and still retain a reasonable return on our investment. Clients usually know what they want and are willing to pay to get it in time. These distributors already know that it won't do them any

good to go to someplace in Asia where they could get a better price if the result is a product that is going to fail," he says.

### MAKING THE MODEL WORK

According to Marstine, two of the key ingredients for success as a master distributor are having space for the widest range of inventory possible and having staff that can be productive.

"When my father started his plumbing business, we worked out of an office, my mother was the bookkeeper and our inventory was kept in a small storage room," Marstine recalls.

In comparison, today's Zenith Supply has more than 55,000 square feet of warehouse and a staff of 10, most of whom have many years on the job.

"With an inventory as big as ours, you might expect more people would be working for us. But I have a staff that does incredible things because they know what's required, and they know they'll be rewarded well," he says. His second-in-command has 30 years, his bookkeeper 40 years and his office personnel 20 to 30 years.

He pays well, provides 100% health care coverage, encourages time off in a family crisis, and the staff socializes at the end of many work days.

As a result, "we have tremendous productivity. We'll get an order in at 3 p.m. in the afternoon that's a fairly good-size order, have it pulled and ready to ship the next day. Because of what we do, we face emergencies a lot and have many last-minute air freight orders, but we have learned how to react quickly," he says.

### DISTRIBUTION TODAY

Marstine says he doesn't see many companies set up as master distributors, and he doesn't think that situation will change anytime soon because of the cost of stocking such a huge supply. However, he says the distribution industry in general is bound for some excellent times.

"It's a world market now. Just 40 or 50 years ago, nobody really considered exporting a valve or a fitting. That's changed because so much of the world is now going through an industrial revolution, which is creating tremendous demand in many places," he says.

Because exporting is part of everyday life, shipping has taken on a significant role in success, but shipping also has changed over the years, Marstine says.

"Back before trucking became deregulated, it used to take maybe a week to 10 days just for us to send something from Pennsylvania down to Houston," he gives as an example. "Today, it take two days at the most, and it's very rare for anything to get lost or misplaced in transport," he says.

Another vital ingredient today is technology, which with an inventory as large as Zenith's, has to be top-notch.

"We know where every single one of our valves are at all times, and we do quotes by Internet and turn those quotes into orders over the Internet," he says.

The one thing that technology cannot do with a business model like his, however, is predict what will be needed on the shelf—one of the greatest challenges in distribution.

"If we were a drug store, we might order 200 tubes of a particular toothpaste during one month of the year,

then when the month rolled around the next year, we might increase that by 2% or so. With us, we might have 100 of a particular valve product on the shelf, and that feels like a lot, but a distributor might be called to a special project that requires all 100 of those items at once. When you're dealing with emergency situations, there is just no way to predict," he says.

So how do they handle restocking?

"My second in command does some of it, but I do most of it myself. With so many years in the business, we've just developed a sense for estimating what we'll need," he says.

Marstine says his company is also not afraid to say "no" should something run out.

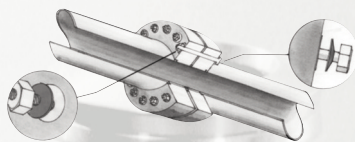
"If we can't make a delivery need, we tell our customer so. We would much rather lose a sale than get into trouble with late deliveries because the most important thing in being a master distributor is building up trust with other distributors that we'll do what we say," he says. ■

GENILEE PARENTE is managing editor of VALVE Magazine. Reach her at [gparente@vma.org](mailto:gparente@vma.org).

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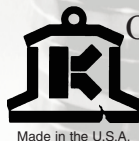
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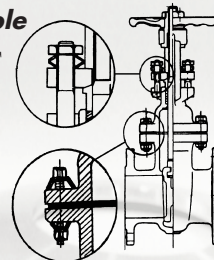
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LIVE LOADING VALVE  
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# Extracting Nutrients, Saving Resources through Livestock Water Recycling

BY KATE KUNKEL

Giant livestock farms, which can house thousands of pigs, chickens or cows, produce vast amounts of manure—they can generate the waste equivalent of a small city. The problem of what to do with this waste is often not addressed properly, creating environmental problems that affect humans, fish and entire eco-systems.

However, Livestock Water Recycling (LWR), a company in Calgary, Alberta, Canada, has developed a technology with the potential to change how manure is treated around the world. The concept behind the technology is simple but revolutionary and important enough that LWR squeaked past entries from more than 1,000 Canadian businesses to win a major grant. The funds will allow the company to spread its technology into the U.S. and international markets.

## THE TECHNOLOGY

LWR uses a patented water recycling system to extract and clean fertilizer nutrients from manure for reuse. So far, LWR systems have been installed at dairy and hog operations across Canada. The first U.S. system was installed at a dairy in New York followed by Shiloh Dairy in Brillion, the first Wisconsin dairy to install LWR's system.

To illustrate the extent of the possibilities, Shiloh Dairy alone generates 30 million gallons of livestock manure each year. A dairy spokesperson said LWR's technology is expected to recycle 18 million gallons of clean water, 6 million gallons of liquid nutrient concentrate (ammonium sulfate and potassium), and 6,000–12,000 tons of solid fertilizer (organic nitrogen and phosphorus) from that manure every year.

The recycled water can be used for cleaning or watering the cattle and it can be stored for crop irrigation or released. The fertilizer nutrients can be strategically applied to land in a way that can maximize fertilizer value, or it can be sold to generate new revenue.



□ Pumps, piping and valves in the livestock recycling process

Because of the huge environmental impact potential of this technology, VALVE Magazine spoke to LWR President Ross Thurston to find out why livestock recycling is important and how it's done.

## TOO MUCH OF A GOOD THING

For centuries, farmers have used the manure produced from their operations as fertilizer. Such manure is rich in nutrients and water, and it was simply spread on the fields to help crops grow. However, the huge livestock operations that dominate modern farming today produce much more manure than would have been produced on the same amount of land in the past.

"Although manure is a great fertilizer, spreading it can result in run-off, which contaminates valuable water sources," says Thurston. "LWR's technology can recycle and clean water, and concentrate nutrients from the effluent."

Such processing also reduces the overall volume to be handled "providing a cost-effective and environmental-

ly friendly alternative for livestock operators," he says.

The process involves mechanical and chemical water treatment that segregates nutrients and pathogens from the manure, Thurston explains.

"It focuses on the isolation and concentration of solids and valuable nutrients such as phosphorus, potassium, ammonia and nitrogen," he says.

Each step of the process captures a different nutrient, then, "The last phase of the process uses a membrane filtration system to recycle the clean water."

Meanwhile, "there is zero discharge so all parts of the initial influent are reused and recycled as valuable outputs to be reused at the livestock operation," Thurston says.

The intake material, which is a mixture of livestock manure and water, is fed to the LWR system by a progressive cavity slurry pump. Separators and screens remove the solids from the liquid. After the solids are separated, the liquid is collected in a transfer tank. A pump used to move the liquid to the

fine solids removal stage is the same as the inlet pump. The liquid is then pumped into the feed tank of the membrane filtration system.

Centrifugal pumps drive the liquid through the membrane and separate the process stream into concentrated nutrient and clean water. A throttling globe valve at the nutrient discharge end of the membrane filtration system controls the performance of the membranes.

### VALVES IN THE SYSTEM

LWR uses two types of valves in its systems—globe valves for throttling on the membrane filtration system and ball valves for isolation.

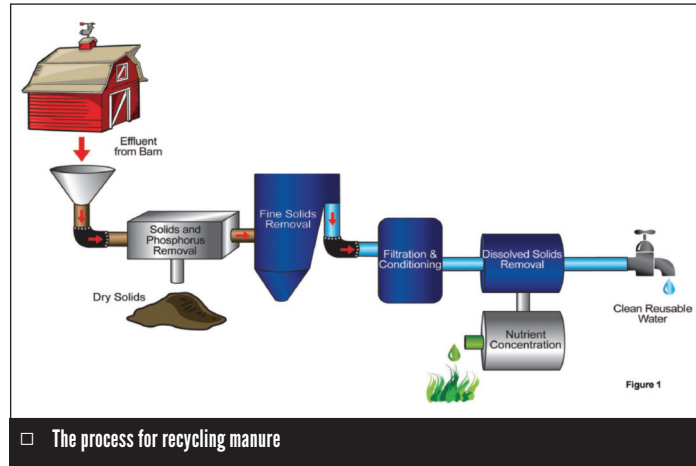
Thurston explains that most of the ball valves are PVC valves, which isolate system components for purposes of maintenance and service. Some smaller valves also are used to take analytical samples from the process stream. Globe valves regulate the discharge flow from membrane filtration so that the nutrients and clean water can be separated at a pre-determined percentage.

“The valves in these systems need to be able to stand up to the components in the manure,” says Thurston. “That can change according to the area and the livestock, but all our valves are constructed of either PVC or stainless steel. Valve seats are all EPDM or Buna,” he adds.

Most valves throughout the system are manually actuated, although a few valves that automatically switch the membrane filtration system from normal operation to an in-place cleaning process are electrically operated. When the cleaning process is finished, these valves are de-energized to switch the membrane filtration system back to normal operation.

The entire process is controlled with a programmable logic controller (PLC) and an operator interface. The system is accessible remotely for viewing system parameters, making operational changes and conducting troubleshooting.

“The biggest challenges for valves and actuators in this process is the cor-



□ The process for recycling manure

rosive atmosphere,” Thurston says. “There is ammonium in the process fluid, and the building atmosphere also has low levels of ammonia and H<sub>2</sub>S.”

While various geographical areas and kinds of livestock present different challenges, the overall base process is the same from site to site. Because there are small differences between systems to deal with different types of manures, “We test each clients’ manure in our lab prior to the construction of the equipment to determine the best treatment protocol. It is an individual-

ized system,” Thurston says.

### AN INCREASING NEED

According to the United Nations Water Development Report, agriculture currently accounts for 70% of withdrawals of freshwater in the world. Meanwhile, by 2050, world food production will need to rise by 70% to meet the needs of an anticipated 9 billion people. Without technological advances, it may not be possible to

meet that need. New materials and engineering breakthroughs such as livestock water recycling and the valve innovations developed to ensure the success of these efforts mean the planet is more likely to have the limited and precious resource of water that will help feed the world.

For more information on this process, visit [www.LivestockWaterRecycling.com](http://www.LivestockWaterRecycling.com). ■

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## Q: HOW MUCH DO I NEED TO BE CONCERNED ABOUT GALVANIC CORROSION WHEN SELECTING VALVE MATERIALS?

**A:** This is a good question, and the answer should begin with discussing exactly what is meant by galvanic corrosion.

When two different metals are electrically coupled in the presence of an electrolyte (i.e., an electrically conductive fluid such as salt water), an electrical voltage or potential is developed between the two metals. This voltage will drive electrical current and will cause accelerated corrosion of one of the metals. The metal that exhibits accelerated corrosion is called the anode while the other is the cathode. The cathode is said to be more “noble” than the anode.

For a given electrolyte, a galvanic series can be developed. This is essentially a listing of metals and alloys in order of their relative nobility—from highest to lowest—in that particular electrolyte. The most common galvanic series is that for seawater. A shortened, simplified version of this series is shown in Figure 1 as an example.

One noticeable factor here is that

some of the metals and alloys don’t appear in this list in the order that one might expect. Some materials that are commonly used for resistance to seawater or salt-spray are lower on the list than materials not often used. An example would be zinc vs. carbon steel. Zinc has fairly good corrosion resistance in these environments, whereas carbon steel rusts very quickly. However, when electrically coupled, the zinc becomes the anode and corrodes, and the carbon steel becomes the cathode and does not corrode.

This has practical significance. For example, zinc coatings applied by hot-dip galvanizing are often used to protect carbon and alloy steels from corrosion in marine environments. The zinc coating protects the underlying steel in two ways: 1) as a barrier coating by resisting corrosion, and 2) by “galvanic protection,” which protects the underlying steel even if there is a break in the zinc barrier.

### AREA EFFECT

Another characteristic of galvanic corrosion is that it exhibits an area effect. If the surface area of the cathode exposed to the electrolyte is increased or the surface area of the anode exposed to the electrolyte is decreased, the anode will corrode at a higher rate. If the exposed surface area of the cathode is much larger than the exposed surface area of the anode, the corrosion rate can be very high. Conversely, if the exposed surface area of the cathode is much smaller than the exposed surface area of the anode, the corrosion rate at the anode will be very low.

This area effect plays strongly into decisions regarding the use of dissimilar metals in corrosive situations. For example, carbon steel is clearly anodic to 300-series stainless steels in corrosive solutions. Because of this, one would expect that using these materials in combination would cause galvanic corrosion of the steel. However, many carbon steel valves are sold with 300-series stainless-steel trims, which don’t cause a problem. The reason is that the carbon steel valve

body combined with the carbon steel piping system has a very large exposed surface area compared with the surface area of the nobler 300-series trim, thereby causing very little galvanic corrosion potential. This is also the reason graphite can be used for gaskets and other sealing components in valves, even though it is nobler than any metal.

If this combination is reversed, and a trim material is chosen that is less noble than the valve body, the potential for accelerated corrosion of the trim is increased. If the valve body and the piping are both nobler than the trim, the potential for accelerated corrosion of the trim can be very high.

There have been a number of instances where failure to consider the effects of galvanic corrosion have resulted in excessive corrosion.

Examples are:

- Excessive corrosion in 440C valve trim installed in a duplex stainless-steel body in a duplex stainless-steel piping system in a corrosive refinery application
- Excessive corrosion of CW2M valve bodies and trim installed in a titanium piping system flowing water containing chlorine dioxide in a paper mill
- Excessive corrosion of N05500 shaft and pins in a super-austenitic stainless-steel valve installed in a superduplex stainless-steel piping system in seawater service
- Excessive corrosion of S17400 shafts in butterfly valves with CF8M bodies installed in a 316 stainless-steel piping system (process fluid unknown)
- Excessive corrosion of carbon steel valve bodies installed in a 304 stainless-steel piping system flowing chloride-containing water

Because of all this, when the process fluid is an electrolyte, it is best to ensure that the trim materials are at least as noble as the body, and that the body material is at least as noble as the piping. **VM**

**DON BUSH** is a principal materials engineer at Emerson Process Management—Fisher Valve Division ([www.emersonprocess.com](http://www.emersonprocess.com)). Reach him at [don.bush@emerson.com](mailto:don.bush@emerson.com).

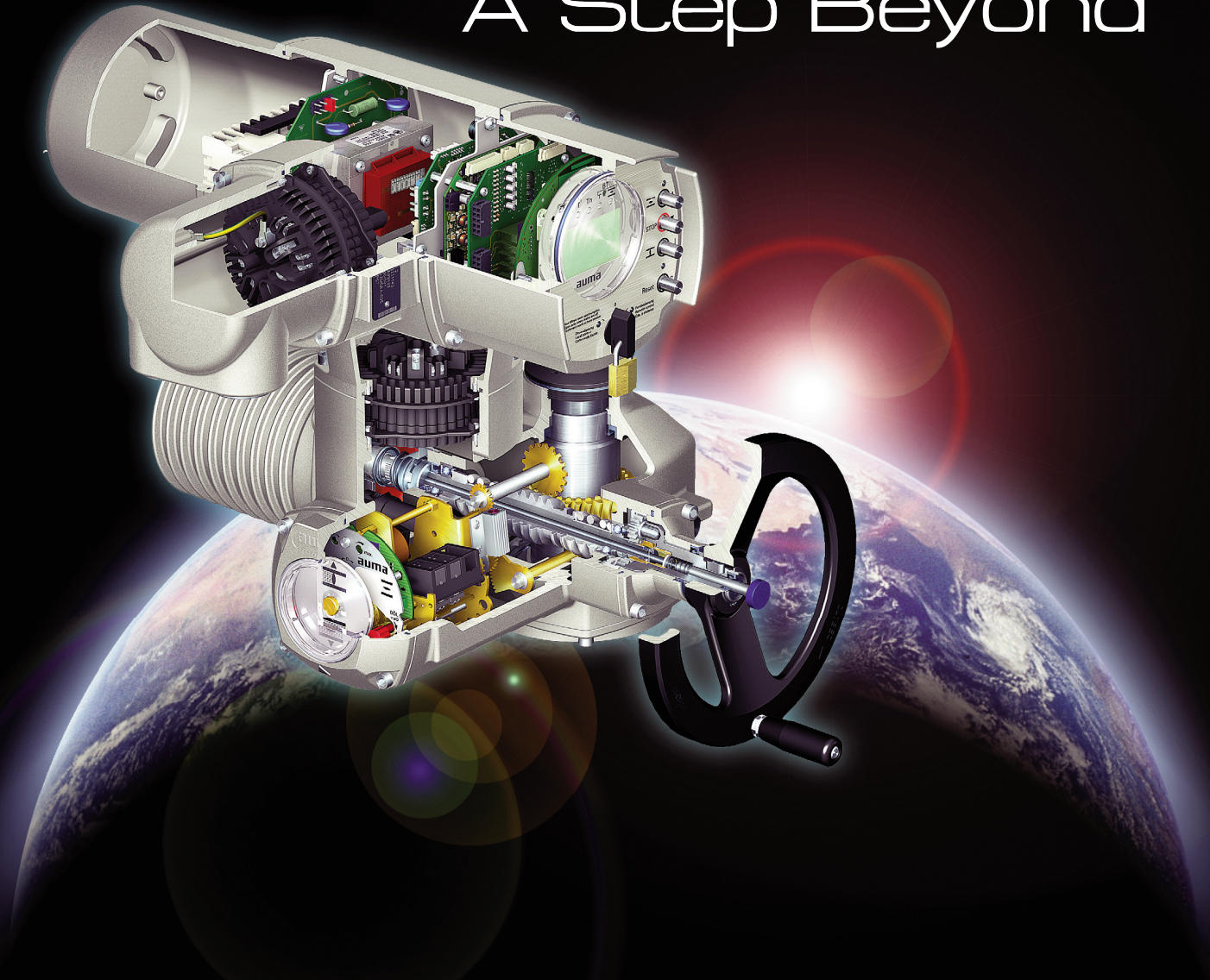
□ Figure 1. Galvanic series for seawater

#### Most Noble

- Graphite
- Gold
- Silver
- Titanium
- Alloy 20 (N08020, CN7M)
- 316 (S31600, CF8M)
- Nickel-Copper (N04400, M35-1)
- Copper
- Yellow Brass
- 410 SST (S41000, CA15)
- Tantalum
- Chromium
- Nickel
- Copper
- Gray Cast Iron
- Carbon Steel (A105, A106 Grade B, WCC)
- Lead
- Aluminum
- Cadmium
- Zinc

#### Least Noble

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For information on joining the Valve Manufacturers Association, contact Bill Sandler at 202.331.8105 (wsandler@vma.org).

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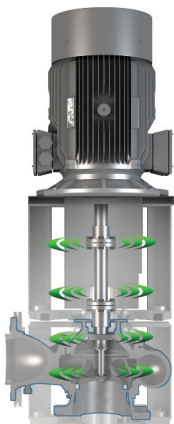
For more information on joining the Valve Repair Council, contact Marc Pasternak at 202.331.0104 (mpasternak@vma.org).

**SPIRAX SARCO** released the new AEL6 series, a smart, high-speed linear electric actuator. The series controls steam and other industrial fluids without the need for compressed air. It meets requirements of applications that need fast response from control valves and a high thrust fail-safe function such as heat exchanger applications within the institutional market.

Benefits include reductions in lifetime energy costs, carbon emissions and plant downtime. The AEL6 range also can develop preventative maintenance schedules.



**COLFAX FLUID HANDLING** introduced an active valve control option to its Smart Technology CM-1000 Series intelligent seawater cooling system controller. The new controller can be applied to both new-build and retrofit operations. It is designed to enhance shipboard seawater cooling system pumping efficiency while lowering operating and maintenance costs and maximizing uptime. The new product valve control offers potential energy savings of up to 85% and reduces maintenance by up to 50%. The series uses sensors to monitor real-time operating conditions such as tempera-



tures in the freshwater cooling loop, as well as the pumps' suction and discharge pressure and allows the controller to regulate the flow of sea water to the coolers according to varying heat loads from the main engine and generators.

**DEZURIK** announced the new KSV Severe Service Knife Gate Valve, designed especially for highly abrasive services. The valves have high level features and workmanship that enable them to meet ANSI B16.34 Class 150 and 300 pressure ratings. They have bi-directional dead-end shutoff capability, bi-directional drip tight seal, bonnetless design for ANSI 300 service and a wide variety of hardened seat materials.

The valve is suited to abrasive slurry applications and has been successfully installed in a variety of applications in other industries including high density (10–12%) pulp stock, digester blow-down isolation, bio-fuels production and municipal sludge.



**VICTAULIC** has received type approvals from DNV (Det Norske Veritas) for its Vic-300 MasterSeal butterfly valves Series 761 and Vic-Check check valves Series 716 and 716H. The approval certificates cover Class III piping systems for

fresh water cooling, condensate return, non-essential systems, sanitary drains and non-essential service air on vessels.

The butterfly valves have approval in the size range DN50–300 (2–12 inches) with a pressure rating of 21 bar (300 psi) and a temperature range from 32–250°F (0–121°C). The Vic-300 valve bodies and discs are manufactured from ductile iron conforming to ASTM A-536, with electroless nickel coating conforming to ASTM B-773 on the discs. A choice of EPDM, nitrile or fluorelastomer seat is available.



**ITT** introduces the Pure-Flo VSP+, which adds new features to the Value Switch Package (VSP) product offering. The VSP+ incorporates a mechanical self-setting feature that reduces calibration time. Once the switch is installed on a process valve, the operator simply

strokes the actuator to set the switch.

To improve visual position indication from a distance, the new VSP incorporates high output open, closed and power LEDs, allowing the operator to safely and quickly evaluate process status.

Capable of withstanding typical wash-down media, the new product extends the capability of the standard VSP. The VSP+ is available for 1/2–2 inch (DN 15–50) valves and can be specified with mechanical silver, mechanical gold, PNP and Namur switches.

**SIEMENS** Sitrans FM MAG 1100F (magnetic flow meter) has received the U.S. Department of Food and Drug Administration's Pasteurized Milk Ordinance (PMO) certification, which is needed to sell into the milk and dairy market in the U.S. The MAG 1100F sensor is specifically designed for the food and beverage and pharmaceutical industries, and is available with hygienic and flexible process connections. The product features compact or remote mounting, and easy, plug and play field changeability of the transmitter. The wafer design meets EN 1092, DIN and ANSI flange standards, and the sensor housing is made from corrosion resistant AISI 316 stainless steel. With a temperature rating of up to 392°F (200°C), the flow meter is well-suited for process industries.



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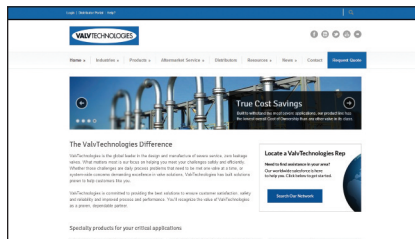
announces a 12V dc DPDT relay version of its Rosemount 2120 vibrating fork level switch for automated level monitoring and



overspill protection of tanks or vessels in remote locations. The new version is the first low-power switch to provide a built-in relay output, eliminating the need for a separate switching relay. The 12V switch is suited to installations where there is no access to normal 24V power supplies and the only power available is from batteries or solar charged systems. It has all the features of the standard versions, including built-in instrument health/self-checking diagnostics, but is uniquely designed for use in low-power circuits.

Based on vibrating short fork tech-

nology, the switch is good for all liquid applications and is unaffected by flow, turbulence, bubbles, foam, vibration or product variations.



**VALVTECHNOLOGIES** has launched a new website at [www.valv.com](http://www.valv.com). The company's revamped Internet presence offers customers round-the-clock access to service requests, product specifications, brochure downloads and customer satisfaction surveys as well as enhanced news room and social media features. The site also features expanded sections for news, events and worldwide distribution locators as well as expanded product information and quote requests. **VM**

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